WHO IS USING THE EMERGENCY DEPARTMENT FOR NON-URGENT CARE? CHARACTERISTICS OF INDIVIDUALS THAT USE EMERGENCY DEPARTMENTS AS A USUAL SOURCE OF CARE

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A Thesis

by

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Abstract

of

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Statement of Problem

The use of emergency departments for non-urgent care is increasing; creating greater stress for California's already crowed emergency departments. This thesis analyzes the relationship between an individual's demographic, socioeconomic, and health care characteristics and the use of emergency departments for routine health care.

Sources of Data

This analysis uses data from the 2005 California Health Interview Survey from the University of California, Los Angeles. The survey was a telephone survey of a large sample of California residents who were asked numerous health care related questions. I used multivariate logistic regression to identify the effects of certain characteristics on emergency departments for routine health care while controlling for all other variables.

Conclusions and Implications

My analysis finds that several explanatory variables have a significant effect on emergency department use for non-urgent care. The findings of the regression analysis performed suggest that current reform proposals aiming to increase access to health

insurance and health care services will have the greatest effect on reducing the use of emergency departments for non-urgent care.

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Chapter 1

INTRODUCTION

The United States, more specifically, the state of California, is facing a looming health care crisis. Health care is unaffordable to many, access to care is declining, and emergency departments are severely overcrowded. Individuals are increasingly turning to emergency departments for routine health care, placing further burden on a system already on the brink of collapse. In an effort to develop solutions to ease the strain on emergency departments and repair a part of the broken health care system, interest has arisen in discovering who is using emergency departments for routine care. The purpose of this thesis is to address the question: what factors influence an individual's use of the emergency department for routine health care? To answer the question, this thesis uses regression analysis to identify the link between an individual's demographic, socioeconomic, and health care characteristics and the use of emergency departments for routine health care. The remaining sections of this chapter present background information on the use of emergency departments and the severity of the overcrowding problem in California. The final section of this chapter presents a layout of this entire thesis.

Background

For decades, emergency departments have provided the public with emergency medical care and access to health care services, creating a last line of defense for the health care system and an option of last resort for patients. According to the California

Healthcare Foundation (2009), hospital emergency departments serve two roles: 24-hour access to medical services and a point of entry into an inpatient hospital setting (p. 1). In 1986, the role of emergency departments was legally defined in the Emergency Medical Treatment and Active Labor Act (EMTALA). The EMTALA states that if any individual requests screening or treatment in an emergency department setting, the hospital must provide medical services to the best of its ability. The act also mandates that emergency departments cannot refuse anyone in need of emergency medical care regardless of citizenship, legal status, or ability to pay, creating a safety net in the health care system (U.S. Department of Health and Human Services, 2009). In recent years, emergency departments have experienced severe overcrowding resulting in long wait times and forcing hospitals to divert ambulances to other areas.

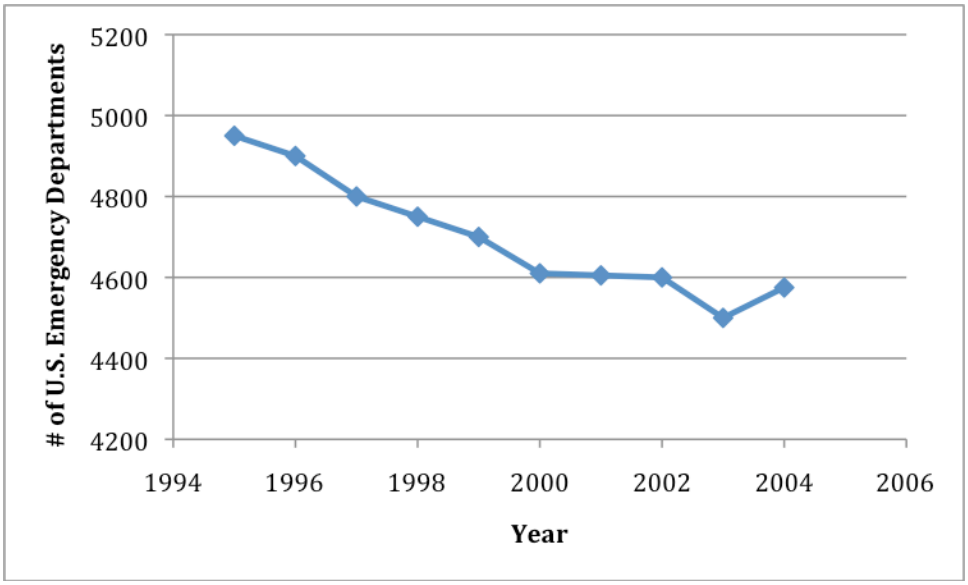
Although the primary function of emergency departments is to provide individuals with urgent medical care, they are often used for routine medical care, or non-urgent care. Emergency department use for non-urgent care increases overcrowding and redirects attention from patients in need of critical care, decreasing the quality of treatment for all patients (Kuryk, 2006, p. 69). Overcrowding also forces crowded emergency departments to divert ambulances to less compacted hospitals, essentially delaying medical treatment. In 2002, a study for the American Hospital Association found that nearly 48% of U.S. hospitals diverted incoming ambulances because of overcrowding (Lewin Group, 2002). Ambulance diversion, as a result of overcrowding, increases the amount of time it takes critically ill patients to receive care or sends patients

to hospitals less equipped to care for them; in many situations, the extra miles and minutes can mean life or death.

An example of the severity of overcrowding and ambulance diversion occurred in 2007 when a middle-aged woman phoned 911 because she was experiencing chest pains. Although Mount Auburn Hospital, a hospital with an intensive cardiac care unit, was near her home, her ambulance was diverted to nearby Cambridge Hospital because of overcrowding. The hospital staff at Cambridge was unable to perform the necessary surgery in time and the woman died in the emergency room. This adverse outcome could have been avoided if the emergency department at Mount Auburn Hospital was not above capacity and the woman was not diverted to another hospital (Cohn, 2007). Both ambulance diversion and overcrowding result in poorer outcomes for patients, a compromise in the quality of care provided, and frustrations among emergency department staff.

Hospital and emergency department closures combined with the increased use of emergency departments for routine health care have contributed to the overcrowding problem (McConville & Lee, 2008, p. 1). According to a recent study, the number of emergency departments decreased by 9% nationally between 1995 and 2005 while the number of emergency visits increased (Appleby, 2008). Using data from the New England Journal of Medicine (Kellerman, 2006), Figure 1-1 shows the decline in the number of U.S. emergency departments between 1994 and 2004. The decreasing number of emergency departments is making the issue of overcrowding even more severe. With

fewer hospital beds and fewer physicians to treat patients, emergency department wait times have increased by hours in some cases, causing many patients to leave without receiving treatment. Additionally, emergency department patients face higher nurse to patient rations, which is related to higher mortality rates and a decrease in quality measures (Bernstein, Boggs, Derlet, Handly, Hinfey, & Kamens, 2006). With a declining number of emergency departments available, it is increasingly important to develop solutions that provide alternative sources for non-urgent care to free up emergency departments to focus solely on treating trauma and urgent care.

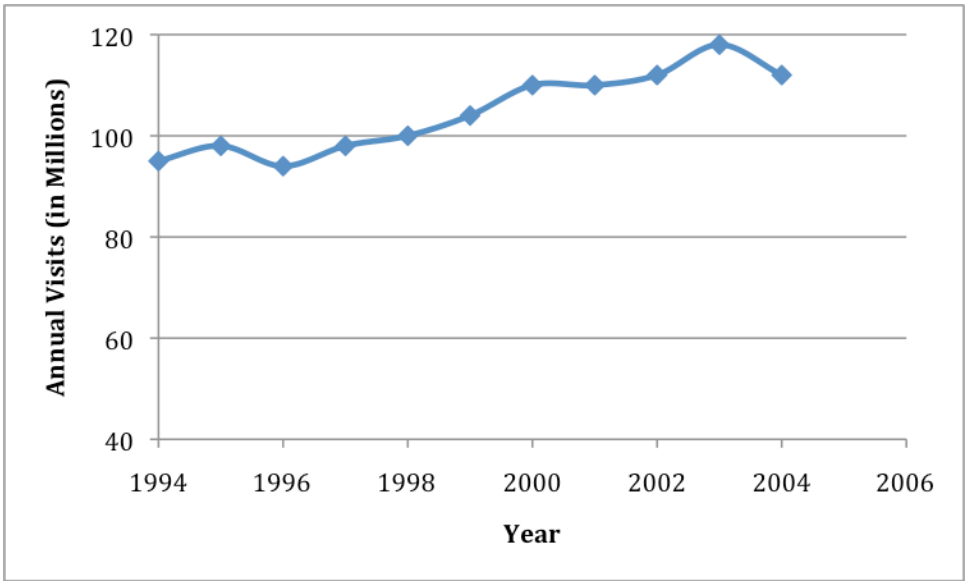


Source: Kellerman (2006)

Figure 1-1. Number of emergency departments in the U.S.

Concurrently, the numbers of emergency departments available are decreasing as the numbers of visits to emergency departments are increasing. Emergency department visits increased by over 32% nationally, from 90.3 million to 119.2 million, between

1996 and 2006 (American College of Emergency Physicians, 2008, p. 7). Figure 1-2 displays the growth in the annual number of emergency department visits between 1994 and 2004, again using data from the New England Journal of Medicine.



Source: Kellerman (2006)

Figure 1-2. Number of U.S. emergency departments visits.

While the increasing number of uninsured Americans contributes to the overcrowding problem, there are likely to be other factors as well. Such factors will be further discussed in Chapter 2. Although emergency department overcrowding is occurring throughout the United States, the condition of California's emergency departments is among the worst in the nation. The following section discusses the condition of California's emergency departments compared to that of other states.

The Severity of Overcrowding in California

The current economic crisis has hit the state of California swiftly and critically. The state's unemployment rate currently hovers at over 12% compared to 10% nationally, and the percentage of uninsured Californians is rising, placing a greater strain on our health care system. The state is facing the worst budget crisis in years and state-sponsored health programs like Healthy Families, Medi-Care, and Medi-Cal received severe cuts in budget negotiations. It is likely that the number of uninsured Californians, which has increased exponentially, is one of many contributing factors to the overcrowding problem, especially given the current economy. Nearly 500,000 Californians have lost their health insurance since the beginning of the economic decline in 2007 and the number continues to grow (Roan, 2009). With such a dire economic situation in California, it is possible the state's emergency departments will not be able to meet the demand in the coming years.

The condition of California's health care system, and specifically emergency departments, is much poorer than that of several other states. In a report card issued by the American College of Emergency Physicians (2008), California's emergency departments were given a "D+" and a rank of 37 because of several factors including a lack of a sufficient number of health care providers and emergency department beds. The report also cited California's uninsured and those on publicly provided health insurance as contributing factors to the state's poor emergency department ratings. In comparison, Massachusetts, a state with a universal health care program, received a "B" grade

(American College of Emergency Physicians, 2008, pp. 35-36). The rating suggests there may be a link between the condition of emergency departments and insurance coverage. Table 1-1 compares the findings of the ACEP National report card for both California and Massachusetts.

Table 1-1

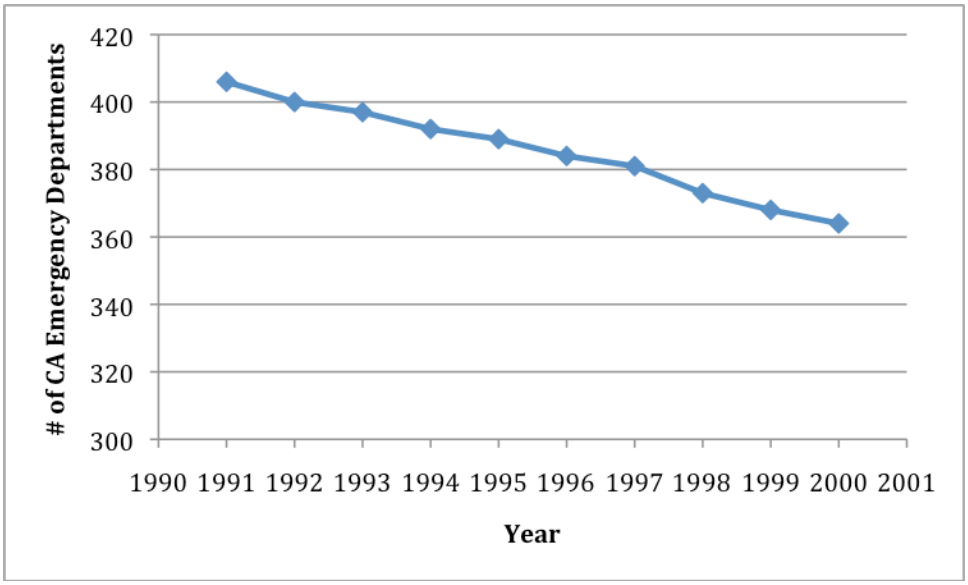
Grades of ACEP National Report Card

	California		Massachusetts	
	Rank	Grade	Rank	Grade
Access to Emergency Care	51	F	3	B
Quality & Patient Safety Environment	44	D-	6	A
Medical Liability Environment	9	B-	33	D
Public Health & Injury Prevention	6	B+	1	A
Disaster Preparedness	40	D+	19	B
Overall	37	D+	1	B

Source: American College of Emergency Physicians (2008)

Public hospital and emergency department closures combined with the increased use of emergency departments for routine health care are contributing factors to the overcrowding problem. In California, more than 70 hospitals have closed in the last 10 years bringing the number of emergency departments per capita to 6.12 per 1 million people, compared to an average 19.9 per 1 million people in most other states (Colliver,

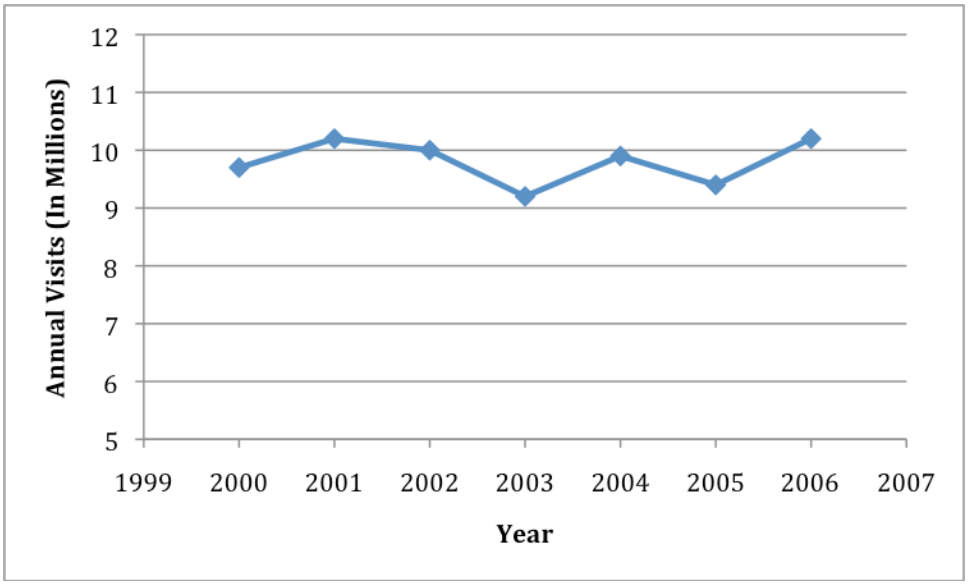
2008). Figure 1-3 shows the decline in the number of emergency departments in California between 1991 and 2000.



Source: Kaiser Family Foundation (2009) & U.S. Census Bureau (2008)

Figure 1-3. Number of emergency departments in California.

Additionally, California has seen a recent increase in emergency department visits, similar to national trends. Figure 1-4 displays the growth in the annual number of emergency room visits between 2000 and 2006. With a declining number of emergency departments available and an increase in visits, it is increasingly important to develop solutions to provide alternative sources for non-urgent care happening at emergency departments. The following section briefly presents a few of the main proposals for reducing emergency department overcrowding.



Source: Kaiser Family Foundation (2009) & U.S. Census Bureau (2008)

Figure 1-4. Number of emergency departments visits in California.

Health Care Reform and Solutions for Emergency Departments Overcrowding

Public policy organizations, government officials, and health care professionals agree there is a need for improvement in the condition and delivery of the state's emergency departments. An extensive report by the Public Policy Institute of California (as cited in McConville & Lee, 2008, p. 20), concluded it is a necessity to improve the conditions and efficiency of California emergency departments and address other aspects of the health care system intrinsic to state emergency departments. A recent article in the L.A. Times stated, "We have a system that is incapable of meeting basic needs, it all comes together in the ERs, where the rich and poor, insured and uninsured meet and are treated based on need… and where all must wait" (Johnston, 2009, ¶ 1). The main issue

however, is that while many of these individuals and organizations agree there is an overcrowding problem, there is a general lack of consensus on solutions.

During the past few years, numerous proposals for health care reform have been presented to ease the stress on the health care system. Most of the proposals aim to increase access to health insurance, with the intention of increasing access to medical services. It is pertinent to reform the entire health care delivery system to solve emergency department overcrowding. Table 1-2 presents the most common/popular broad proposals for health care reform. The health care reform proposals being floated by both federal and state legislators, as well as President Obama,incorporate the ideas of the broad health care reform proposals.

Table 1-2

Broad Health Care Reform Proposals

Reform Proposal	What it Does
Universal Health Care	This would expand funding and increase access to public programs such as Healthy Families and Medi-Cal, as well as increasing funding for community clinics
Public Insurance Option	This give individuals without employer provided insurance the option to purchase a government run insurance policy. This is designed to increase insurance competition, stabilize premiums, and allow individuals to get insurance regardless of pre-existing conditions.
Single Payer System	This would create a government run health care system similar to programs across Europe. This is a proposal for reform in California not across the nation. This would eliminate for-profit insurance.

The three main proposals for health care reform aim to increase an individual's access to health insurance and health care services. The proposals are the single-payer system (previously proposed as California Senate Bill 840), the universal health care option (proposals that create a health care mandate), and the current health care bills being voted on in the United States Congress (HR 3961 and HR 3962). Congressional health reform bills HR 3961 and HR 3962 propose to stabilize medical costs, create competition in the health insurance industry, reduce the number of uninsured individuals, and increase access to care for all Americans. To achieve the goals, the authors of the bills propose health care reforms in several areas including medical liability reform, creation of a public option for health insurance, and several insurance market reforms (American Medical Association, 2009). Through the expansion of access to health insurance, the reform intends to increase access to routine and preventative medical care in a clinic or primary care setting, therefore reducing the use of emergency departments for non-urgent care. By improving the entire health care delivery system, the aim is to relieve some of the pressure on emergency departments by creating options for individuals to receive routine health care in other settings.

At the state level, forms of both Universal Health Care and a single-payer system have been proposed. In 2007, Governor Arnold Schwarzenegger's Health Care Reform package and Assembly Bill 8 proposed a "universal" health care system by expanding already existing public programs to cover a larger number of the uninsured population. The expansion included the "Healthy Families" program and the Medi-Cal program. Both

proposals also included an employer mandate that would require employers to provide health insurance or pay into a public insurance fund (Wicks, 2007). Another proposed solution is to create a government-run single-payer health insurance system. Senate Bill 840 (SB840) introduced by Senator Sheila Kuehl would have created a state-run, single-payer program that would cover every person in California. The bill also proposed a government-administered California Health Insurance System (CHIS). It would eliminate private insurance companies and consolidate all health care tasks into a state health insurance agency. Single-payer health care is common in many European nations and in Canada (Wicks, 2007). The proposals, like the ones at the federal level, aim to increase access to care and reduce non-urgent emergency department visits by making health insurance more attainable. Unfortunately, all three proposals failed to make it out of the state legislature.

Chapter 5 of this thesis discusses the above proposals in more depth, focusing on their effect on emergency rooms. The findings of the regression analysis performed in this thesis will then be compared to the health reform proposals to determine the best solution to ease emergency department overcrowding and the use of emergency departments for non-urgent health care. The regression findings provide an idea of the characteristics of individuals who use emergency departments for non-urgent care, and provide insight for policymakers developing solutions to ease overcrowding and the general decline of the health care system. The next section of this chapter provides an overview of the rest of the chapters of this thesis.

Overview of Thesis

To develop solutions to ease emergency department overcrowding, it is crucial to know the factors influencing an individual's use of the emergency department for routine health care. To know such factors, the following chapters of this thesis use regression analysis to identify the link between demographic, socioeconomic, and health care characteristics and an individual's use of emergency departments for routine health care.

Chapter 2 reviews the existing literature on emergency department usage and what variables influence an individual's usage of emergency departments for routine health care. The findings of that chapter are used to guide the selection of variables for the analysis. In Chapter 3, I present the methodology for the regression analysis, which includes the presentation of a model that is the basis for the regression analysis including a description of the dependent variable, the explanatory variables, and the predicted relationship between the dependent variable and the explanatory variables. In Chapter 4, I present the regression results in addition to describing the dependent and independent variables, as well as the relevant descriptive statistics and the simple correlation coefficients of the independent variables. Finally, in Chapter 5, I conclude the thesis by identifying the significant variables that may be factors in emergency department use based on the regression results, the implications for public policy based, and conclusions based on the findings.

Chapter 2

LITERATURE REVIEW

The lack of access to care for many Californians has created a critical need for health care solutions that will, in turn, relieve some of the stress placed on our crowded emergency departments. To develop solutions that will ease emergency department overcrowding, it is necessary to identify the characteristics of individuals who use the emergency department for non-urgent care. In this chapter, I review the existing academic literature on emergency department usage; more specifically what variables influence an individual's use of non-urgent care. The existing literature and the findings of studies reviewed in this chapter provide a foundation for the regression analysis performed in the following chapters of this thesis.

Section I of this chapter outlines the relevant literature on emergency department use and the variables associated with non-urgent emergency department use. The findings are organized into three themes that represent variables often associated with emergency department use for non-urgent care: race/ethnicity, socioeconomic status, and access to primary care. Section II of this chapter identifies the key findings from the literature and the implications for this thesis. In the Appendix, Table A1 summarizes the research methods and results of all the regression studies used in this review of the existing literature. The studies represent a wide variety of methods and sample sizes, many of which have conflicting and often contradictory results.

I. Factors Contributing to Non-Urgent Emergency Department Usage

Several studies have been conducted on emergency department overcrowding and usage. One study estimates that up to 82% of emergency department visits are non-urgent and are better served by a primary-care provider (Peterson, Burstin, O'Neil, Orav, & Brennan, 1998, p. 1249). In another study, Suruda, Burns, Knight, and Dean (2005) found that 40% to 60% of all emergency department visits are non-urgent and that social and economic factors, access to other medical services, and consumer-choice influence use (p. 1). While most of the literature agrees that a significant portion of emergency department usage is "inappropriate" or non-urgent, the evidence regarding the causes is contradictory. In the existing literature, three main variables (or "themes") influence a person's use of emergency departments for routine health care or non-urgent use: 1) race/ethnicity, 2) socioeconomic status, and 3) access to primary care. The following is a discussion of how the three variables affect a person's emergency department usage.

Race/Ethnicity

Studies show that race/ethnicity has a significant relationship with an individual's emergency department usage (Baker, Stevens, & Brook, 1996), while other studies found no significant relationship when other variables are controlled (Hong, Baumann, & Boudreaux, 2007). There are significant discrepancies in the findings of several studies as income, socioeconomic status, and demographics are often associated with race/ethnicity. A regression study at a teaching hospital at the University of California, Los Angeles (UCLA) finds that African American respondents (19%) are almost twice as likely as

Hispanic respondents (11%) to report two or more emergency department visits in the three months before the study. Surprisingly, Caucasian respondents were also more likely than Hispanics, with 11.4% reporting two or more visits to the emergency department in the three months before the study (Baker, Stevens, & Brook, 1996). While the above study indicates that race/ethnicity may be a factor in emergency department use, the results neglect to control for other socioeconomic factors related to race. In another regression study, Miller (2000) states that in using a multivariate model, poor African American children were five to seven times more likely than non-poor, non-African American children to use the emergency department for routine care, especially for asthma treatment (p. 429). A cross-sectional study at a Rhode Island emergency department also found similar results; African American respondents were 2.7 times more likely than Caucasian respondents to identify the emergency department as their usual source of care although the research does not indicate if all other factors were controlled (O'Brien, Stein, Zierler, Shaprio, O'Sullivan, & Woolard, 1997). The findings provide a legitimate argument that a relationship between race/ethnicity and the emergency department usage may exist although they do not take into account that the direct cause may be socioeconomic, often a result of one's race/ethnicity.

In contradiction, other studies found that race/ethnicity is not a significant predictor of emergency department usage when controlling for income and socioeconomic status. According to Hong, Baumann, and Boudreaux (2007), research that indicates race/ethnicity single-handedly influences emergency department usage is

flawed leaving no logical reason why skin-color should account for emergency department usage (p. 149). It is more likely that "culture," as proxied by race, is an indicator of socio-economic factors; this should be controlled for in future studies. Other variables such as income and socioeconomic status are also associated with race and are related to non-urgent emergency department usage. African Americans and Hispanics are more likely to be part of a disadvantaged population with a lack of primary care options and a medical knowledge that can lead to emergency department use for routine health care. Controlling for socioeconomic variables achieves a more accurate analysis of the relationship between race/ethnicity and emergency department usage for routine care. The ability to properly control for other independent variables when determining the significance of one independent variable is a consistent limitation of the existing literature. This next section examines what the research focusing on the impact of socioeconomic status found.

Socioeconomic Status

A significant portion of the literature finds that variables related to socioeconomic status present the greatest indicator of an individual's emergency department use for non-urgent care. Socioeconomic status (or indicators) generally refers to an individual's income level, employment status, education level, insurance status, and/or occupation. In an international observational study of emergency department use, Lombrail, Vitoux, Bourrillon, Brodin, and De Pouvourville (1997) found an association between heavy emergency room use and underprivileged socioeconomic status in several countries (p.

231). Not surprisingly, insurance status and income levels are the strongest indicators of emergency department usage in several studies. Hong et al. (2007) found that insurance status and education were indicators of more frequent emergency department use for routine care. The study concludes that individuals with less than a high school degree were almost 20% more likely to use the emergency department for routine care than those with a high school diploma when controlling for all other variables (p. 154). Since education level and income are directly related, it is possible that educational level is an indicator of income. In future analyses, it would be beneficial to individually control for the variables of socioeconomic status to determine what other factors are statistically significant. It would also be important to not omit any variables that may be indicative of socioeconomic status to prevent an omitted variable bias.

The general assumption that the poor and uninsured are the most frequent users of emergency departments for non-urgent/routine care is slightly flawed. While numerous studies have found that income is an indicator of emergency department usage, it appears that being uninsured is not an entirely accurate indicator. Much of the existing literature has found that while uninsured individuals use emergency departments more than privately insured individuals, they do not account for the largest portion of non-urgent emergency department usage. A comprehensive regression study of medical care in California by McConville and Lee (2008) finds that emergency department usage rates for publicly insured individuals (Medi-Cal and Medicare) are significantly higher than rates for uninsured individuals. For non-elderly adults (18-64), uninsured individuals

account for 20% of all emergency department visits while publicly insured individuals account for 29% (McConville & Lee, 2008, p. 10). Research also indicates that publically insured individuals use emergency departments more than privately insured individuals do. After controlling other relevant explanatory variables, adults covered by Medi-Cal are 6% more likely than privately insured individuals to visit an emergency department (McConville & Lee, p. 17). Baker et al. (1996) have similar findings with 11.8% of patients without insurance reporting two or more emergency department visits compared to 22.1% of Medicaid (similar to Medi-Cal but at the national level) patients (p. 679). In Washington State, a cross-sectional study at an emergency department found that while 66% of individuals in the study possessed some form of insurance, only 16% had private insurance (Brim, 2008). The above studies, while varying in magnitude, all indicate that insurance status and types are indicators of emergency department use. However, the current public insurance programs are based on an individual's income levels, effectively blurring the lines between the socioeconomic variables.

Access to Primary Care

Another variable that predicts emergency department usage is an individual's access to primary care that disproportionately favors the privately insured. The American Academy of Family Physicians (2009) defines the role of primary care as an individual's first point of access into the health care system and includes access to disease prevention, health maintenance, and diagnosis of acute and chronic illnesses. It is a common assumption that if an individual has access to a primary care facility for routine

healthcare, they are less likely to use an emergency department for non-urgent care. Additionally, it is important to note that treatment in a primary care facility or clinic is significantly lower in costs compared with treatment in an emergency department (American Academy of Family Physicians, 2009). In a multivariate regression study, the absence of a primary care physician had a significant effect on emergency department usage. The study suggests that the use of a primary care physician decreases the use of emergency departments for non-urgent care by almost half (Peterson et al., 1998). Consequently, maintaining a relationship with a primary care physician disproportionately favors individuals with health insurance. There is still an issue of access to care, especially among poor individuals. Another study found that 67% of non-urgent emergency department users identified a usual source of care other than the emergency room (Weber, Showstack, Hunt, Colby, & Callaham, 2005). This indicates the possession of a usual source of care may have a significant relationship to emergency department usage but it is unclear how strong that relationship might be.

While several studies illustrated that routine health care prevents the use of emergency rooms for non-urgent use, there seems to be a direct relationship between routine health care and socioeconomic status. Despite having a usual source of care, other barriers, such as high co-payments and difficulty in obtaining appointments, could prevent individuals from accessing their usual source of care. Brim (2008) reported that 53% of emergency department respondents reported an attempt to make an appointment with their primary care physician, but nearly 66% were unable to obtain one. This result

indicates that having insurance and a primary care provider does not necessarily mean having access to a physician when an individual is sick. In California, primary care physicians that accept Medi-Cal patients are rapidly declining (Holahan & Garrett, 2009). With the current budget environment in California, and shrinking reimbursement rates for physicians, it is likely the trend will continue. This will leave the poor and disadvantaged with less opportunity for routine health careoutside an emergency department setting (Weber et al., 2005). Individuals may be insured through Medi-Cal, but unable to obtain primary care services. With this issue, it makes it very difficult to identify primary care access as a separate indicator from insurance status and other socioeconomic factors. In future analyses, it will be pertinent to control for socioeconomic factors to identify whether primary care is significant in decreasing emergency department use. In the following section, I discuss the key findings from the studies mentioned.

II. Key Findings from the Literature

In reviewing the literature from previous studies, a variety of utilized methods was discoverd as well as contrasting findings. Additionally, the basis of all the literature reviewed was causal-comparative studies. The researchers are observing a condition (in this case, the use of emergency departments) and searching for possible causal variables (low socioeconomic status, race/ethnicity, access to primary care, etc.). Each study in the literature, then, carries an opportunity for error since in most cases there are likely several causal variables. Furthermore, much of the literature is limited as the studies were conducted at individual emergency departments and only account for patients that visited

those emergency departments. This omits the general population by only analyzing those that present at emergency departments, likely creating biased results by not sampling an inclusive population. Hence, analyzing the results is difficult, as one is not able to compare the characteristics of those that use the emergency room for non-urgent care with those individuals that use a primary care office or community clinic.

While some studies have found that race/ethnicity proves to be a reliable indicator of emergency department usage, other studies have criticized the findings and the lack of control variables. It is because some of the previous studies looked for indicators of emergency room use for non-urgent cases and others looked for causality. Given the research on socioeconomic discrepancies among minorities, it is logical to assume that race/ethnicity alone should have no effect on emergency department usage when controlling for socioeconomic variables unless race is a proxy for a greater cultural tendency to use emergency departments. As stated by Hong et al. (2007), “racial/ethnic differences in ED use we observed are a consequence of race/ethnicity and SES” (p. 154). In the literature in which socioeconomic variables are controlled, race/ethnicity has no statistically significant effect on emergency department usage. In my analysis, it will be important to control for all variables that could distort the effect of the independent variables on the dependent variable (emergency department usage). There is also strong evidence that socioeconomic variables are significant indicators of emergency department usage and the relationship is further analyzed in this thesis.

The existing literature presumes that while insurance status itself may not be a reliable indicator of emergency department use, type of insurance may be. For future analysis, it would be beneficial to look at both insurance status and type of insurance. A better indicator might be the use of Medi-Cal or Medi-Care versus private insurance versus no insurance, and it is important to look at such variables for this analysis. Having a usual source of care does not appear to be a reliable indicator of emergency department use, as it does not necessarily indicate access to that source when necessary. The existing literature demonstrated that individuals are not always able to attain appointments when needed at their usual source of care. However, the literature does seem to indicate that expanded access to health care services does reduce emergency department use for non-urgent care. As a result of these discrepancies and the inconsistencies in determining an individual's access to primary care (including the ability to obtain an appointment), the use of primary care services will not be analyzed in this thesis separate from identifying a usual source of care.

Implications for this Thesis

As previously stated, a weakness of most of the existing literature is the sampling technique. The studies that take place in emergency rooms do not accurately represent the population. Additionally, individuals in need of urgent care are not going to visit a researcher and fill out a questionnaire as the methods in several of the above studies indicated. Thus, in future studies, it is not only important to consider independent variables and proper controls but to use a sample representative of an entire population.

For the following analysis, I use the 2005 California Health Interview Survey from the University of California, Los Angeles. The survey was a telephone survey of a large sample of California residents who were asked numerous health care related questions. It resolves the issue of the lack of a broad based sample used in previous studies that only sample emergency department visitors.

In addition, several of the large studies failed to account for the percentage of respondents who indicated they have no usual source of care by omitting them from the studies (Wall, Rhodes, & Kennedy, 2002). It is important to acknowledge this research limitation, as such individuals are more likely to use the emergency department when needing medical care. For this reason, the dependent variable in my regression analysis encompasses those that have no usual source of care in addition to those that identify emergency departments as their usual source of care. In the existing literature, it also appears that the methods used to identify the specific variables within socioeconomic status are inconsistent and often result in conflicting findings. In this thesis, it is important to control for variables both individually and as a whole in order to find which ones are true indicators of emergency department usage. For example, I will analyze race separately from percentage of federal poverty level. This will allow me to identify whether skin color and genetic make-up influence an individual's medical decisions or if it is actually a result of income level.

Based on the review of the literature, I expect that several variables will be significant indicators of emergency room use for non-urgent care, specifically

socioeconomic variables. This thesis will offer further investigation of the variables examined in the literature as well as additional variables to support or not support the findings for California. The next chapter presents the regression model for my analysis of the characteristics of individuals that use emergency departments for non-urgent care. The expected effect of the explanatory variables on the dependent variable used in this analysis stems from the findings of this literature review.

Chapter 3

METHODOLOGY

The existing literature indicates that several characteristics might have an effect on emergency department use for routine health care. In this chapter, I describe the model that is the basis for the regression analysis and the data selected as the dependent and independent variables. In Section I, I give a broad definition of regression analysis and how it applies to this thesis. In Section II, I present the regression model, including further explanation of the dependent variables and the causal factors. Finally, in Section III, I present information about the data used in the regression analysis.

I. Regression Analysis

In the remainder of this thesis, I use regression analysis to identify a link between personal characteristics and emergency department use for non-urgent care. Regression analysis is a statistical method that investigates the relationship between a dependent variable and the independent variables thought to cause variation in it. In other words, regression analysis uses data and models to attempt to explain the changes in the value of a dependent variable as a function of changes in a specific explanatory (independent) variable, holding all other explanatory variables constant.

It is important to note that regression analysis does not prove causality but rather tests whether a correlation exists (Studenmund, 2006, p. 6). As mentioned previously, for the purpose of this thesis I am explaining the changes in an individual's emergency department usage for routine health care as a function of his/her demographic,

socioeconomic, and health care characteristics. Therefore, regression analysis will allow me to determine if there is a relationship between an independent variable and emergency department use, holding all other factors constant, but will not definitively determine if the independent variable causes emergency department use for non-urgent care. However, a well-specified regression model (that does not suffer from omitted variable bias) provides strong evidence in support of such causal relationships. In the next section, I provide a description of the regression model and the variables used.

II. Regression Model

The dependent variable for this regression model is an individual's use of an emergency department as the source of routine health care as was identified in the 2005 California Health Interview Survey (CHIS). In the survey, respondents were asked specifically "What kind of place do you go to most often – a doctor's office, a clinic or hospital clinic, an emergency room, or some other place [when you are sick or need health advice]?" (UCLA Center for Health Policy Research, 2005, p. 79). The question is important as a dependent variable because it identifies those individuals who may use the emergency room as a source of routine health care. By identifying what factors affect emergency department usage for non-urgent care, one can begin to develop policy solutions to increase access to routine health care and reduce emergency department overcrowding. For the purpose of this regression, I created a dummy variable for this answer in which respondents answering that their source is emergency departments are given the value of one, and all other responses are given a value of zero. Respondents

that stated they had no usual source of care were also included as one because, since they have no usual source of care, they will likely go to the emergency department if they fall ill.

Casual Model

The broad casual factors expected to cause variation in emergency department usage are demographic characteristics, socioeconomic characteristics, and health care status. The variables were derived from the responses to the 2005 California Health Interview Survey questions (UCLA Center for Health Policy Research). It should be noted that all of the independent variables with the exception of "Age" are dummy variables. The excluded categories in the series of dummy variables are included in the function and are identified as excluded.

The model is shown as the following function:

> *Emergency Department As Source of Non-Urgent Care= f* (demographic characteristics, socioeconomic characteristics, health care status)
>
> where**,**
>
> *Demographic characteristics= f* [(American Indian (?) Asian Pacific Islander (?), African American (+), Hispanic (-), Two or More Races (?), Caucasian-excluded), US Citizen (?), Married (?), Have Children (+), Age (?), Male (?)]
>
> *Socioeconomic Characteristics= f* [Unemployed (+), (High School Diploma (?), Less than High School Diploma (+), No Formal Education (+), College/Vocational Degree-excluded), Income- Wealthy (-), (0-99% Poverty Level (+), 100-199% of Federal Poverty Level (+), 200-299% of Federal Poverty Level (+), 300% and up of Federal Poverty Level –excluded), (Live in Suburban Area (-), Live in 2nd City (?), Live in Rural Area (?), Live in Urban Area-excluded)]

Health care Status= f [Uninsured (+), (Excellent Health (?), Good Health (?), Fair Health (?), Poor Health - excluded), On Medi-Care (+), On Medi-Cal (+)]

Expected Direction of Effect

Each independent variable has an expected effect on the dependent variable, an individual's use of the emergency room as his/her usual source of non-urgent care. The expected direction of the effect of each explanatory variable on the dependent variable is indentified as either a positive effect (+), a negative effect (-), or an uncertain effect (?) and are located in the paragraphs. The above expectations are based on the existing literature and the previous studies cited in Chapter 2.

The existing literature produced contradicting evidence on whether demographic characteristics have an effect on emergency department use or if the results are due to cultural factors. The assumption is that race will have a positive effect on emergency department usage. As a result of the literature, African Americans use emergency departments for routine health care more than Caucasians. Although the literature regarding Hispanic use is contradictory, the majority of sources indicate that being Hispanic would have a negative effect compared to Caucasian respondents. However, it is unknown whether the effect is actually a result of race or related socioeconomic and cultural variables. Contrary to popular belief, existing literature has found that non-citizens do not use the emergency department at a greater frequency than citizens (McConville & Lee, 2008). Hence, I believe that citizenship has an unknown effect. It also appears likely that individuals with children will use the emergency department more

as children tend to get sick more often and more suddenly. It is unclear if being married, the respondent's age, or being male will have any relationship to emergency department usage.

Socioeconomic characteristics appear to have a significant effect on emergency department use as a source of routine health care. Although it appears that being unemployed and having a lower education level have a positive effect on the dependent variable, I would assume that other explanatory variables related to work status and education also have an effect (i.e. Percent of Federal Poverty Level). As income increases (Income-Wealthy), it is expected that emergency department usage for routine health care will decline as those with higher income and educational levels have increased access to routine health care. It is expected that the percentage of Federal Poverty Level will have a negative effect on emergency department use since as the percentage increases a person is more likely to have access to routine health care in a primary care setting. Those below 100% of the federal poverty threshold have lower incomes and will most likely resort to emergency department non-urgent care. The level of urbanization in which a person lives is often a result of their socio-economic status. For this reason, it is unclear what effect living in an urban, suburban, second city, or rural area will have on the dependent variable once all other variables (like an income measure) are controlled.

The specific variables in health care status appear to have a significant effect on emergency department usage for non-urgent care. Although the existing research is inconclusive, it is reasonable to assume that uninsured individuals will use the emergency

department more frequently for routine health care. It is unknown whether general health status has a positive, negative, or any effect at all on emergency department use for routine health care. Finally, the literature suggests that variables for Medi-Cal and Medi-Care users will also have a positive effect on the dependent variable due to the difficulty in finding and affording primary care providers that accept public forms of insurance (McConville & Lee, 2008). As stated in Chapter 2, it is not known if the explanatory variables in health care status alone influence emergency department use or if it is a proxy for socioeconomic characteristics. The following section provides a further description of the variables used for the regression analysis.

III. Data

In this section, I explain the variables selected for the regression model. This includes an explanation as to why certain variables are chosen as proxies for the broad casual factors discussed in the previous section. The variables for demographic characteristics are American Indian, Asian Pacific Islander, African American, Hispanic, Two or More Races, U.S. Citizen, Married, Have Children, Age, and Male. As stated previously, it is important to note that all the variables are dummy variables with the exception of Age. The variables are common proxies for demographic characteristics and similar variables are used in the existing literature.

The variables used to describe socioeconomic variables include Unemployed, High School Diploma, Less than a High School Diploma, No Formal Education, Income-Wealthy, Live in Suburban Area, Live in 2nd City, Live in Rural Area/Town, 0-99% of

Federal Poverty Level, 100-199% of Federal Poverty Level, and 200-299% of Federal Poverty Level. All of the above variables represent dummy variables and are common measures of socioeconomic characteristics as found in previous studies.

Health care Status refers to the variables for Uninsured, Excellent Health, Good Health, Fair Health, On Medi-Care, and On Medi-Cal. The variables relating to insurance status (uninsured, Medi-Cal, and Medi-Care) may indicate an individual's access to routine health care such as primary care services and illness prevention (for example, flu shots). Variables indicating a respondent's number of visits to an MD and number of visits to the ED were originally used but were then removed as a result of being endogenous.

A list of the variables and a description for each variable used in the regression is found in Table 3-1. All the variables used in this regression analysis were derived from survey responses from the 2005 California Health Interview Survey (UCLA Center for Health Policy Research).

Table 3-1

Variable Description and Sources

Variable	Description
Children	Dummy variable for children, 1= Have Children, 0= Do not have Children
U.S. Citizen	Dummy variable for citizenship status, 1= US Citizen, 0= Non-Citizen
Education - HS Diploma	Dummy variable for education level, 1= HS Diploma, 0= All Else
Education - < HS	Dummy variable for education level, 1= Less than a High School degree (Grades K-11), 0= All Else
Education - No Formal	Dummy variable for education level, 1= No Formal Education, 0= All Else
Federal Poverty Level 0-99%	Dummy variable for percent of Federal Poverty Level, 1= 0-99%, 0= All Else
Federal Poverty Level 100-199%	Dummy variable for percent of Federal Poverty Level, 1= 100-199%, 0= All Else
Federal Poverty Level 200-299%	Dummy variable for percent of Federal Poverty Level, 1= 200-299%, 0= All Else
Health- Excellent	Dummy variable for health, 1= Excellent, 0= All Else
Health- Good	Dummy variable for health, 1= Good, 0= All Else
Health- Fair	Dummy variable for health, 1= Fair, 0= All Else
Income- Wealthy	Dummy Variable for Wealthy, 1= $75000+, 0= All Else
Married	Dummy variable for marital status, 1=Married, 0=Unmarried
Asian Pacific Islander	Dummy variable for race, 1=Asian/ Pacific Islander, 0= All Else
African American	Dummy variable for race, 1=African American, 0= All Else
American Indian	Dummy variable for race, 1=American Indian, 0= All Else
Hispanic	Dummy variable for race, 1=Hispanic, 0= All Else

Table 3-1 continued

Variable	Description
2 or more races	Dummy variable for race, 1=Two or more races, 0= All Else
Suburban	Dummy variable for Urbanization, 1= Suburban, 0= All Else
2nd city	Dummy variable for Urbanization, 1= 2nd city, 0= All Else
Rural/Town	Dummy variable for Urbanization, 1= Urban, 0= All Else
Unemployed	Dummy variable for work status, 1= Unemployed, 0=Employed
Uninsured	Dummy Variable for currently uninsured, 1= Yes, 0= No
Medi-Care	Dummy variable for currently insured by Medi-Care, 1=Yes, 0= No
Medi-Cal	Dummy variable for currently insured by Medi-Cal, 1=Yes, 0= No
Age	Respondents Age
Male	Dummy variable for sex, 1=Male, 0=Female
Usual Source of Care	Dummy Variable for usual source of care, 1=ER, 0= Other Location

The following tables provide additional information about the data used in the regression analysis. Table 3-2 displays the descriptive statistics (variable name, mean, standard deviation, maximum, and minimum) for each variable used. Table 3-3 displays the correlation matrix providing the simple correlation coefficients between the independent variables. This table uses the Pearson's Correlation Coefficient to measure the strength and direction of the relationship between two independent variables (Pollach, 2008). Correlation coefficients present an overview of the relationships between the independent variables. It is important to look at the correlation coefficients to both

develop a general idea about the relationships between two variables and to identify possible multicollinearity among variables. Multicollinearity occurs when one variable is a perfect linear function of another variable (Studenmund, 2006, p. 94). A positive correlation coefficient indicates a positive association between the variable, as one variable increases so does the other. A negative coefficient indicates a negative association between the variables, as one variable increases the other variable decreases. The descriptive statistics below are based on 8,532 observations from the 2005 California Health Interview Survey (N=8532) (UCLA Center for Health Policy Research).

Table 3-2

Descriptive Statistics

Variable	Minimum	Maximum	Mean	Standard Deviation
Children	.00	1.00	.3402	.47382
U.S. Citizen	.00	1.00	.8259	.37918
Education- HS Diploma	.00	1.00	.2453	.43030
Education- < HS	.00	1.00	.1471	.35422
Education- No Formal	.00	1.00	.0083	.09085
Federal Poverty Level 0-99%	.00	1.00	.1525	.35951
Federal Poverty Level 100-199%	.00	1.00	.2004	.40034
Federal Poverty Level 200-299%	.00	1.00	.1328	.33937
Health- Excellent	.00	1.00	.2162	.41171
Health- Good	.00	1.00	.5866	.49247
Health- Fair	.00	1.00	.1539	.36087
Income- Wealthy	.00	1.00	.2848	.45135

Table 3-2 continued

Variable	Minimum	Maximum	Mean	Standard Deviation
Married	.00	1.00	.4516	.49768
Asian Pacific Islander	.00	1.00	.0973	.29636
African American	.00	1.00	.0418	.20024
American Indian	.00	1.00	.0081	.08957
Hispanic	.00	1.00	.2502	.43317
2 or more races	.00	1.00	.0313	.17412
Suburban	.00	1.00	.1902	.39250
2nd city	.00	1.00	.3012	.45881
Rural/Town	.00	1.00	.1831	.38675
Unemployed	.00	1.00	.3319	.47093
Uninsured	.00	1.00	.2778	.44793
Medi-Care	.00	1.00	.1665	.37259
Medi-Cal	.00	1.00	.1193	.32418
Age	18.00	85.00	46.1515	17.20131
Male	.00	1.00	.4662	.49889
Usual Source of Care	.00	1.00	.5000	.50003

Table 3-3

Correlation Matrix

	Children	U.S. Citizen	Education - HS Diploma	Education < HS	Education- No Formal	Federal Poverty Level 0-99%
Children	1	-.198**	-.033**	.134**	.010	.120**
U.S. Citizen	-.198**	1	.043**	-.386**	-.145**	-.301**
Education- HS Diploma	-.033**	.043**	1	-.237	-.052**	.045**
Education- < HS	.134**	-.386**	-.237**	1	-.038**	.291**
Education- No Formal	.010	-.145**	-.052**	-.038**	1	.090**
Federal Poverty Level 0-99%	.120**	-.301**	.045**	.291**	.090**	1
Federal Poverty Level 100-199%	.063**	-.142**	.070**	.172**	.031**	-.212**
Federal Poverty Level 200-299%	-.023*	.069**	.080**	-.033**	-.013	-.166**
Health- Excellent	.017	.092**	-.065**	-.133**	-.032**	-.109**
Health-Good	.001	.026*	.024*	-.065**	-.023*	-.068**
Health- Fair	-.009	-.144**	.023*	.203**	.047**	.161**
Income- Wealthy	.050**	.179**	-.149**	-.222**	-.058**	-.268**
Married	.324**	-.070**	-.071**	.015	.001	-.096**
Asian Pacific Islander	.018	-.147**	-.036**	-.051**	-.004	-.009
African American	-.015	.084**	.022*	-.045**	-.019	.017
American Indian	.015	.038**	.006	.001	.006	.024*
Hispanic	.204**	-.466**	.038**	.421**	.135**	.294**

Table 3-3 continued

	Children	U.S. Citizen	Education - HS Diploma	Education < HS	Education- No Formal	Federal Poverty Level 0-99%
2 or more races	-.024**	.077**	.032**	-.039**	-.016	-.007
Suburban	.017	.069**	-.043**	-.082**	-.025*	-.088**
2nd City	.038**	.016	.026*	.010	.016	.011
Rural/ Town	-.037**	.085**	.056**	.005	.0001	.001
Unemployed	-.145**	.052**	.048**	.052**	.015	.098**
Uninsured	.013	-.256**	.070**	.185**	.064**	.175**
Medi-Care	-.299**	.180**	.019	-.004	.001	-.058**
Medi-Cal	.084**	-.077**	.064**	.162**	.054**	.313**
Age	-.313**	.246**	-.084**	-.055**	.004	-.139**
Male	-.048**	-.051**	-.007	.036**	.028**	-.030**

Table 3-3 continued

	Federal Poverty Level 100-199%	Federal Poverty Level 200-299%	Health- Excellent	Health- Good	Health- Fair
Children	.063**	-.023*	.017	.001	-.009
U.S. Citizen	-142**	.069**	.092**	.026*	-.144**
Education- HS Diploma	.070**	.080**	-.065**	.024*	.023*
Education- < HS	.172**	-.033**	-.133**	-.065**	.203**
Education- No Formal	.031**	-.013	-.032**	-.023*	.047**
Federal Poverty Level 0-99%	-.212**	-.166**	-.109**	-.068**	.161**
Federal Poverty Level 100-199%	1	-.196**	-.096**	-.021*	.100**

Table 3-3 continued

	Federal Poverty Level 100-199%	Federal Poverty Level 200-299%	Health-Excellent	Health-Good	Health-Fair
Federal Poverty Level 200-299%	-.196**	1	-.034**	.041**	-.015
Health-Excellent	-.096**	-.034**	1	-.626**	-.224**
Health- Good	-.021*	.041**	-.626**	1	-.508**
Health- Fair	.100**	-.015	-.224**	-.508**	1
Income-Wealthy	-.316**	-.242**	.177**	.001	-.154**
Married	-.075**	-.033**	.051**	.005	-.046**
Asian Pacific Islander	.015	-.004	-.045**	.016	.010
African American	.015	.003	-.012	-.012	.024*
American Indian	.014	-.020	.003	-.009	.001
Hispanic	.164**	-.016	-.111**	-.014	.144**
2 or more races	-.004	.019	-.022*	.006	.011
Suburban	-.079**	-.024*	.049**	.010	-.061**
2nd City	-.001	.017	.008	.001	.001
Rural/ Town	.037**	.017	.001	.001	-.011
Unemployed	.074**	.026*	.049**	-.066**	.110**
Uninsured	.161**	.043**	-.078**	-.010	.103**
Medi-Care	.054**	.056**	-.077**	-.032**	.065**
Medi-Cal	.143**	-.035**	-.104**	-.060**	.118**
Age	-.026*	.025*	-.031**	-.055**	.043**
Male	-.024*	-.010	.014	0.19	-.027*

Table 3-3 continued

	Income-Wealthy	Married	Asian Pacific Islander	African American	American Indian
Children	.050**	.324**	.018	-.015	.015
Citizen Status	.179**	-.070**	-.147**	.084**	.038**
Education- HS Diploma	-.149**	-.071**	-.036**	.022**	.006
Education- < HS	-.222**	.015	-.051**	-.045**	.001
Education- No Formal	-.058**	.001	-.004	-.019	.006
Federal Poverty Level 0-99%	-.268**	-.096**	-.009	.017	.024*
Federal Poverty Level 100-199%	-.316**	-.075**	.015	.015	.014
Federal Poverty Level 200-299%	-.242**	-.033**	-.004	.003	-.020
Health- Excellent	.177**	.051**	-.045**	-.012	.003
Health- Good	.001	.005	.016	-.012	-.009
Health- Fair	-.154**	-.046**	.010	.024*	.001
Income- Wealthy	1	.260**	.018	-.033**	-.005
Married	.260**	1	.107**	-.071**	-.008
Asian Pacific Islander	.018	.107**	1	-.069**	-.030**
African American	-.033**	-.071**	-.069**	1	-.019
American Indian	-.005	-.008	-.030**	-.019	1
Hispanic	-.222**	.004	-.190**	-.121**	-.052**
2 or more races	-.015	-.058**	-.059**	-.038**	-.016
Suburban	.146**	.062**	.016	-.010	-.014

Table 3-3 continued

	Income-Wealthy	Married	Asian Pacific Islander	African American	American Indian
2nd City	-.016	.006	-.077**	-.022**	.015
Rural/ Town	-.059**	.008	-.131**	-.078**	.045**
Unemployed	-.149**	-.026*	.002	-.011	-.003
Uninsured	-.248**	-.133**	.035**	-.005	-.133**
Medi-Care	-.119**	-.061**	-.070**	-.007	-.005
Medi-Cal	-.203**	-.097**	-.011	.068**	.052**
Age	.004	.072**	-.051**	-.015	-.010
Male	.061**	.032**	.006	-.011	-.008

Table 3-3 continued

	Hispanic	2 or more races	Suburban	2nd City	Rural/ Town
Children	.204**	-.024*	.017	.038*	-.037**
U.S. Citizen	-.466**	.077**	.069**	.016	.085**
Education- HS Diploma	.038**	.032**	-.043**	.026*	.056**
Education- < HS	.421**	-.039**	-.082**	.010	.005
Education- No Formal	.135**	-.016	-.025*	.016	.001
Federal Poverty Level 0-99%	.294**	-.007	-.088**	.011	.001
Federal Poverty Level 100-199%	.164**	-.004	-.079**	-.001	.037**
Federal Poverty Level 200-299%	-.016	.019	-.024*	.017	.017

Table 3-3 continued

	Hispanic	2 or more races	Suburban	2nd City	Rural/ Town
Health- Excellent	-.111**	-.022*	.049**	.008	.001
Health- Good	-.014	.006	.010	.001	.001
Health- Fair	.144**	.011	-.061**	.001	-.011
Income- Wealthy	-.222**	-.015	.146**	-.016	-.059**
Married	.004	-.058**	.062**	.006	.008
Asian Pacific Islander	-.190**	-.059**	.016	-.077**	-.131**
African American	-.121**	-.038**	-.010	-.022*	-.078**
American Indian	-.052**	-.016	-.014	.015	.045**
Hispanic	1	-.104**	-.099**	.022*	-.052**
2 or more races	-.104**	1	-.008	-.002	.023*
Suburban	-.099**	-.008	1	-.318**	-.229**
2nd City	.022*	-.022	-.318**	1	-.311**
Rural/ Town	-.052**	.023*	-.229**	-.311**	1
Unemployed	-.064**	.013	.001	-.012	.040**
Uninsured	.248**	.013	-.071**	-.010	-.018
Medi-Care	-.171**	.001	.021	-.005	.059**
Medi-Cal	.110**	.013	-.077**	.028**	.031**
Age	-.290**	-.026*	.050**	-.034**	.070**
Male	.055**	-.017	-.021*	-.002	.011

Table 3-3 continued

	Un-employed	Un-insured	Medi-Care	Medi-Cal	Age	Male
Children	-.145**	.013	-.299**	.084**	-.313**	-.048**
U.S. Citizen	.052**	-.256**	.180**	-.077**	.246**	-.051**
Education- HS Diploma	.048**	.070**	.019	.064**	-.084**	-.007
Education- < HS	.052**	.185**	-.004	.163	-.055**	.036**
Education- No Formal	.015	.064**	.001	.054**	.004	.028**
Federal Poverty Level 0-99%	.098**	.175**	-.058**	.313**	-.139**	-.030**
Federal Poverty Level 100-199%	.074**	.161**	.054**	.143**	-.026*	-.024*
Federal Poverty Level 200-299%	.026*	.043**	.056**	-.035**	.025*	-.010
Health- Excellent	-.107**	-.078**	-.077**	-.104**	-.031**	.014
Health- Good	-.066**	-.010	-.032**	-.060**	-.055**	.019
Health- Fair	.110**	.103**	.065**	.118**	.043**	-.027*
Income- Wealthy	-.149**	-.248**	-.119**	-.203**	.004	.061**
Married	-.026*	-.133**	-.061**	-.097**	.072**	.032**
Asian Pacific Islander	.002	.035**	-.070**	-.011	-.051**	.006
African American	-.011	-.005	-.007	.068**	-.015	-.011
American Indian	-.003	.011	-.005	.052**	-.010	-.008
Hispanic	-.064**	.248**	-.171**	.110**	-.290**	.055**
2 or more races	.013	.013	.001	.013	-.026*	-.017
Suburban	.001	-.071**	.021	-.077**	.050**	-.021*

Table 3-3 continued

	Un-employed	Un-insured	Medi-Care	Medi-Cal	Age	Male
2nd City	-.012	-.010	-.005	.028*	-.034**	-.002
Rural/ Town	.040**	-.018	.059**	.031**	.070**	.011
Unemployed	1	-.082**	.485**	.207**	.366**	-.200**
Uninsured	-.082**	1	-.277**	-.228**	-.272**	.106**
Medi-Care	.485**	-.277**	1	.130**	.681**	-.084**
Medi-Cal	.207**	-.228**	.130**	1	-.019	-.081**
Age	.366**	-.272**	.681**	-.019	1	-.121**
Male	-.200**	.106**	-.084**	-.081**	-.121**	1

** Correlation is Significant at .01% (two-tailed).
* Correlation is Significant at .05% (two-tailed

Interaction Variables

Like numerous other studies, this thesis uses interaction variables to investigate relationships. Formed by the multiplication of two or more independent variables, this creates a new variable that further explores the relationships (Studenmund, 2006, p. 225). The regression analysis performed in Chapter 4 uses the following three interaction variables: Uninsured African Americans (African American * Uninsured), Hispanic Citizens (Hispanic * U.S. Citizen), and African Americans on Medi-Cal (African American * Medi-Cal). It allows for the examination of the relationship between usual source of care and multiple factors. In other words, the relationship between usual source of care and Uninsured African Americans is dependent on the relationship between Uninsured and African American. In the next chapter, I explain the results of the

regression analysis using the dependent variable, the independent variables and these interaction variables.

Chapter 4

RESULTS

Chapter 3 of this thesis introduced the dependent and independent variables used for the regression analysis based on the findings of the existing literature and previous studies. This chapter presents the results of the regression analyses run on the 2005 California Health Interview data set (UCLA Center for Health Policy Research) using two functional forms, Ordinary Least Squares (OLS) and Logistic Regression (Logit). In Section I, I describe the difference between the two functional forms of regression analysis used in this thesis and the reasons one method is preferred over the other. In Section II, I present the results of the regression analysis using both functional forms and correct for any errors that may occur in the regression. Finally, in Section III, I compare the expected results outlined in Chapter 3 to the actual results of the regression analysis and offer possible reasons for any differences.

I. Functional Forms of Regression Analysis

Choosing a functional form for the regression equation is an important first step in regression analysis. The dependent variable in this regression equation, a person's usual source of medical care, can possess only a value of one if the respondent stated emergency departments or zero if the respondent stated a place other than the emergency department as their usual source of care. Since the dependent variable in this equation is a dummy variable, or dichotomous, an alternative form of regression analysis such as log-log, log-lin, and lin-lin is not appropriate. For a dichotomous dependent variable, the

logistic regression model (Logit) is an appropriate form. The following paragraphs explain the differences between ordinary least squares and logistic regression. While both regressions are appropriate for the dependent variables, the logistic model is preferred as it provides greater accuracy.

Ordinary Least Squares vs. Logistic Regression

The logistic regression model is preferred for two main reasons: 1) it bounds the predicted probability, and 2) it results in a more accurate fit of the model. Since the dependent variable in this regression model is a dummy variable, it can only have a value of zero or one. Using the Ordinary Least Squares model, the predicted probability is not actually bounded by zero or one; leaving the possibility for values to end up outside the meaningful range (below zero or above one). In contrast, the logistic regression model limits the predicted probability to only zero and one. Additionally, compared to the linear model in OLS, logistic regression predicts the data in an s-shaped pattern, keeping both large and small variables within the bounds of zero and one (Studenmund, 2006).

Testing for the overall fit of the model is important in regression analysis. The preferred method for Ordinary Least Squares regression uses R^2, which measures the overall fit of the model. A value of one would indicate a perfect fit using R^2, while a value of zero indicates no relationship between the variables. The OLS model generally results in a lower R^2 even if the model may be a good fit since the dependent variable equals either zero or one but must move linearly from one to the other (Studenmund, 2009, p. 450). This suggests that it is not the most accurate measure of overall fit for an

equation with a dichotomous dependent variable. For the reasons mentioned above, it is better to use logistic regression which uses "pseudo R^2" to measure the strength of the association between the dependent variable and the independent variables. A common technique to find the Pseudo R^2 is to find the percentage of correct predictions. The measure counts the correct number of ones predicted correctly and the correct number of zeros predicted correctly, and weights them by the total possible to yield a percentage (Studenmund, 2006, p. 457).

In the next section, I present the regression results using both the Ordinary Least Squares model and the Logistic Regression model. Although the results are presented using both functional forms, I have chosen to use logistic regression for the remainder of this analysis since it more accurately measures the relationships between a dichotomous dependent variable and the independent variables.

II. Regression Results

In this section, I present the regression results as well as the overall fit of the model using both functional forms. In Table 4-1, the B values represent the regression coefficients. For the OLS model, the values represent the change in probability of an individual citing the emergency department as his/her usual source of care caused by a one-unit change in the independent variable. In the logistic model, Exp (B) represents the transformation of B into an odds ratio. An odds ratio can be difficult to interpret and, therefore, needs to be further translated using the formula: (Exp(B) – 1) *100. This converts the odds ratio into a percentage change in odds. For example, after the

translation is completed, the percentage change in odds for the variable Citizen is –54%, meaning a citizen is 54% less likely than a non-citizen to use the emergency department as their usual source of care. In Chapter 5, I offer a further analysis of the percentage change shown in Table 4.1.

Table 4-1 lists the regression coefficients at the top of the cells with the standard error listed in the parentheses below. Asterisks indicate the statistical significance results using confidence level measures at 85%, 95%, and 99%. Stating that a regression coefficient is statistically significant at 99% means that 99% of the time I can predict that the independent variable has an effect on the dependent variable (the same applies for 85% and 95%). The VIF column represents the variation inflation factors, which measure the extent to which a particular explanatory variable can be explained by the other explanatory variables (Studenmund, 2006). It is used to detect multicollinearity among the explanatory variables.

Table 4-1

Regression Results: Use of Emergency Room as Primary Care Facility is the Dependent Variable

	OLS Results		Logistic Regression Results		
	B	VIF	B	Exp (B)	% Change in Odds
Constant	.682*** (.039)	n/a	1.097***	2.996	199.6
Children	-.049*** (.011)	1.399	-.302*** (.065)	.740	-26
U.S. Citizen	-.142*** (.022)	3.512	-.763*** (.128)	.466	-53.4
Education- HS Diploma	.018* (.011)	1.198	.107* (.067)	1.113	11.3
Education- Less than HS	.054*** (.016)	1.669	.348*** (.099)	1.416	41.6
Education- No Formal	.075* (.051)	1.084	.576** (.344)	1.779	77.9
Federal Poverty Level 0-99%	.111*** (.018)	2.047	.684*** (.109)	1.981	98.1
Federal Poverty Level 100-199%	.063*** (.015)	1.821	.371*** (.089)	1.449	44.9
Federal Poverty Level 200-299%	.023 (.016)	1.414	.120 (.092)	1.127	12.7
Health- Excellent	.128*** (.025)	5.214	.748*** (.145)	2.112	111.2
Health- Good	.065*** (.023)	6.499	.383*** (.136)	1.466	46.6
Health- Fair	.038* (.025)	3.970	.193 (.145)	1.213	21.3
Income- Wealthy	-.037** (.013)	1.763	-.152** (.096)	.859	-14.1
Married	-.089*** (.010)	1.326	-.503*** (.060)	.604	-39.6
Asian Pacific Islander	.017 (.018)	1.357	.111 (.101)	1.118	11.8
African American	-.066** (.032)	2.00	-.340** (.181)	.712	-28.8

Table 4-1 continued

	OLS Results		Logistic Regression Results		
	B	VIF	B	Exp (B)	% Change in Odds
American Indian	.001 (.051)	1.017	-.072 (.283)	.930	-7
Hispanic	-.097*** (.028)	7.325	-.485*** (.169)	.616	-38.4
2 or more races	.022 (.026)	1.038	.110 (.152)	1.116	11.6
Suburban	-.004 (.013)	1.356	-.035 (.078)	.965	-3.5
2nd city	-.009 (.012)	1.413	-.058 (.069)	.944	-5.6
Rural/Town	.009 (.014)	1.397	.046 (.080)	1.047	4.7
Unemployed	.004 (.011)	1.485	.011 (.069)	1.011	1.1
Uninsured	.391*** (.013)	1.578	2.118*** (.080)	8.313	731.3
Medi-Care	-.037** (.018)	2.337	-.078 (.108)	.925	-7.5
Medi-Cal	.084*** (.017)	1.556	.280*** (.094)	1.323	32.3
Age	-.006*** (.000)	2.272	-.032*** (.002)	.969	-3.1
Gender	.102*** (.009)	1.084	.591*** (.055)	1.806	80.6
Uninsured African Americans	.079* (.054)	1.577	.362 (.370)	1.436	43.6
Hispanic Citizens	.069** (.029)	4.850	.308** (.176)	1.360	36
On Medi-Cal & African American	.104** (.058)	1.542	.536** (.313)	1.710	71
MODEL FIT	Adjusted R^2 .314		Pseudo R^2 .763		

N= 8532
*Significant at a 85% confidence level (based on a two-tailed test)
** Significant at a 90% confidence level (based on a two-tailed test)
*** Significant at a 99% confidence level (based on a two-tailed test)

Both Logistic regression and OLS regression find the same variables to be statistically significant with a few exceptions. The statistically significant variables

include: Children, U.S. Citizen, Education - high school diploma, Education - less than a high school diploma, no Formal education, Federal Poverty Level 0-99%, Federal Poverty Level 100-199%, Health Excellent, Health Good, Income-Wealthy, Married, African-American, Hispanic, uninsured, On Medi-Cal, Age, Male, Hispanic Citizen and on Medi-Cal/African American. Likewise, Health - Fair, Medi-Care, and Uninsured/African American are significant using OLS but not when using logistic regression. The results significant at 85% and above are further explained in Chapter 5.

Table 4-2 presents the classification table by calculating the correct and incorrect predications for the regression model, giving the value for Pseudo R^2. Using pseudo R^2, the overall goodness of fit of the model is 0.763. This means that independent variables are able to correctly predict the dependent variable 76.3% of the time. This model is able to predict correctly that a person uses the emergency department as his/her source of routine medical care 70.5% of the time. It is able to predict that an individual has a usual source of care other than the ER 82.1% of the time. This model presents a moderately good fit.

Table 4-2

Classification Table

Observed		Predicted		
		Usual Source of Care		Percentage Correct
		Other	ER	
Usual Source of Care	Other	3501	765	82.1
	ER	1257	3009	70.5
Overall Percentage				76.3

Correcting for Errors

When using the logistic regression model, the test for multicollinearity uses the simple correlation coefficients since logistic regression does not produce Variances Inflation Factors (VIF). However, the VIF's for the Ordinary Least Squares Model will be reported to further test the model for multicollinearity. Multicollinearity exists when there is a strong linear relationship between two or more independent variables. When testing the logistic regression model for multicollinearity, researchers often use an arbitrary value of .80, where statistically significant correlation coefficients greater than .80 indicate multicollinearity (Studenmund, 2006).

Upon examination of the correlation matrix in Table 3-3, multicollinearity is not detected as no values exceed .80. Using the variance inflation factors for the Ordinary Least Squares model, the common rule is that if the VIF is greater than five,

multicollinearity is present and further examination is warranted (Studenmund, 2006, p. 271). In Table 4-1, the variables Health - Excellent, Health - Good and Hispanic all have occurrences of VIF's over five. It is important to note that multicollinearity exists among the variables but since none of the variables exceeds .80 in the correlation matrix and the variables are statistically significant, they will not be removed from the final regression model. It is not necessary to test for heteroskedasticity since a logistic regression model was used. Since there are no occurrences of heteroskedasticity and only mild occurrences of multicollinearity in the regression model, there is no need to correct for errors.

The results of logistic regression can be more difficult to interpret than OLS results. For this reason, the next chapter presents the regression results in a more understandable format, the change in percent of odds. In the following section, I compare the expected results stated in Chapter 3 to the actual results presented in the previous section.

III. Actual vs. Expected Results

Table 4-3 lists the expected relationships the explanatory variables have with emergency department use as the usual source of care compared to the actual relationships for the explanatory variables that are significant at 99%, 90%, and 85%. In the paragraphs following the table, I describe possible reasons for the differences between the expected and actual results. The variables for Children and African American have an unexpected relationship to using the emergency department as the usual source of care.

Table 4-3

Expected Results vs. Actual Results

	Expected Results	Actual Results (Statistically Significant)
Children	+	-
U.S. Citizen	?	-
Education- HS Diploma	?	+
Education- Less than HS	+	+
Education- No Formal	+	+
FPL 0-99%	+	+
FPL 100-199%	+	+
Health- Excellent	?	+
Health- Good	?	+
Income- Wealthy	-	-
Married	?	-
African American	+	-
Hispanic	-	-
Uninsured	+	+
Medi-Cal	+	+
Age	?	-
Male	?	+
Hispanic Citizens	n/a	+
On Medi-Cal & African American	n/a	+

Having children has a negative impact on emergency department usage for routine health care, holding all else constant. One reason for this may be that individuals with children are more likely to have a pediatrician, primary care doctor, or health clinic that he/she takes the children to for routine health care. This indicates that when children visit the emergency department it is actually for urgent care. Another possible reason is that there is greater access to health insurance for children, even if an individual has a low income. Programs like Healthy Families in California or the universal health care program in San Francisco provides insurance for children and families who do not qualify for Medi-Cal but are not able to afford private insurance. Having access to health insurance provides families with greater access to health care services.

The variable for African American also has a surprising result. Compared to Caucasians, African Americans are less likely to use the emergency department as the usual source of health care. The possible reasons for this are not entirely clear. Since the regression model controls for all other independent variables, socioeconomic status is not a reason for this relationship. One possibility is that certain ethnicities may have a certain aversion to emergency departments. This will cause them to seek other sources of care like community clinics and primary-care providers.

The regression analysis provided both expected and unexpected results. The pseudo R^2 is .763 suggesting a good fit of the model. Additionally, of the 31 independent variables, 19 are significant to at least an 85% confidence level. In the next chapter, the statistically significant results are further analyzed. I also use the results to analyze the

implications of health reform proposals and if they will affect emergency department usage.

Chapter 5

CONCLUSION

As stated in the previous chapters, the purpose of this thesis is to address the question of what factors influence an individual's use of the emergency department for routine health care. A regression analysis model was used to identify the link between an individual's demographic, socioeconomic, and health care characteristics and his/her use of emergency departments for non-urgent health care. Chapter 1 presented the background information on the issues facing emergency departments and a basic outline of this thesis. Chapter 2 reviewed the existing literature and studies on emergency department usage and identified the variables found to influence an individual's usage of emergency departments for routine health care. In the next chapter, the methodology for the regression analysis was presented and the dependent and independent variables were described. Chapter 4 introduced the results of the regression analysis using two functional forms, Ordinary Least Squares and Logistic Regression, and described why logistic regression is the preference for models with dichotomous dependent variables.

Finally, in this concluding chapter, I interpret the statistically significant regression results and discuss the policy implications of these findings. Section I presents the statistically significant results of the logistic regression model for variables with a confidence level above 85%. Section II presents the policy implications of these findings, focusing on the current health care reform proposals. Lastly, Section III presents the conclusion of this thesis.

I. Statistically Significant Regression Results

As previously stated in Chapter 3, regression analysis investigates the relationship between a dependent variable and the explanatory variables. Although regression analysis does not prove that the independent variables cause emergency department usage for non-urgent care, the results can provide strong evidence of such causal relationships. Table 5-1 presents the statistically significant explanatory variables. The table also provides a column with Exp (B) calculated into the percentage change in odds. This shows the percentage change in odds of the dependent variable, usual source of care, for a one-unit change in the independent variable. The last two columns in the table display the lower and upper confidence intervals for the percentage change in odds. Confidence intervals show the range for the coefficients, meaning the true coefficients will fall somewhere between the lower and upper range 95% of the time (Studenmund, 2006).

Table 5-1

Statistically Significant Variables

	Logistic Regression Results			
	Exp (B)	% Change in Odds	95% C.I. for %Change in Odds- Lower	95% C.I. for %Change in Odds- Upper
Children	0.74	-26	-34.9	-16
U.S. Citizen	0.466	-53.4	-63.7	-40.1
Education- HS Diploma	1.113	11.3	-2.4	27
Education- Less than HS	1.416	41.6	16.6	72
Education- No Formal	1.779	77.9	-9.3	249.1
FPL 0-99%	1.981	98.1	59.9	145.4
FPL 100-199%	1.449	44.9	21.6	72.7
Health- Excellent	2.112	111.2	58.8	180.8
Health- Good	1.466	46.6	12.4	91.3
Income- Wealthy	0.859	-14.1	-25.9	-0.4
Married	0.604	-39.6	-46.3	-32
African American	0.712	-28.8	-50.1	1.5
Hispanic	0.616	-38.4	-55.8	-14.2
Uninsured	8.313	731.3	610.4	872.7
Medi-Cal	1.323	32.3	9.9	59.2
Age	0.969	-3.1	-3.6	-2.7
Male	1.806	80.6	62.2	101.1
Hispanic Citizens	1.36	36	-3.7	92.2
On Medi-Cal & African American	1.71	71	-7.4	215.8

Figure 5-1 displays the 95% confidence intervals from Table 5-1. The bar chart represents the upper and lower bound of estimated effect of each explanatory variable.

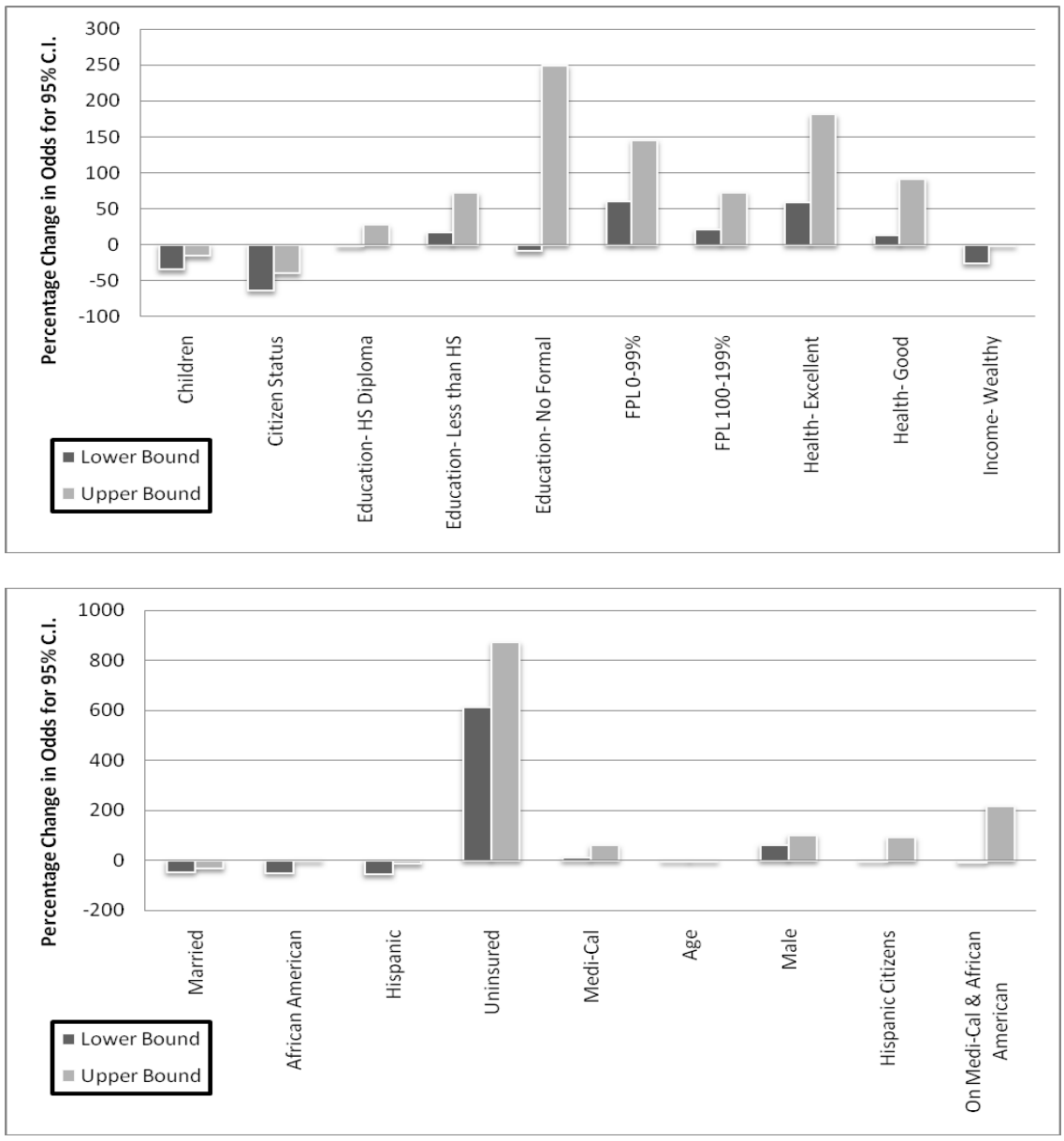


Figure 5-1. Percent change in odds for statistically significant variables.

Although several of the explanatory variables are statistically significant, a few of the independent variables have the largest impact. Individuals with incomes that range from 0 to 99% below the federal poverty level have a 59.9% to 145.5% greater chance than individuals above 300% above the federal poverty level of citing emergency departments as their usual source of health care. Individuals with no formal education are nearly 80% more likely than those with a college degree to cite the emergency department as his/her usual source of care. In addition, wealthy individuals are 14.1% less likely than those with lower incomes to use the emergency department as his/her usual source of care.

Demographic characteristics also have a relationship with the dependent variable even after controlling for all other variables. Hispanics (-38.4%) and African Americans (-28.8%) are less likely than Caucasians to use the emergency department for non-urgent care. However, Hispanic citizens are 36% more likely than non-Hispanic citizens to use emergency departments. African Americans on Medi-Cal are also more likely (71%) than non-African Americans on Medi-Cal to have no other source of medical care.

Perhaps most notable are the effects of insurance status on the dependent variable. For uninsured individuals, the odds of using emergency departments as the usual source of care are 610% to 873% higher than for insured individuals. In addition, individuals on Medi-Cal are 32.3% more likely than those who are not to cite emergency departments as his/her usual source of care. These findings indicate that not only do the uninsured use emergency rooms as their usual source of care, but those on public insurance are also

using emergency departments at alarming rates. It is likely related to an individual's inability to access primary care services if he/she is uninsured or on public insurance. In the following section, the policy implications of these findings are presented.

II. Policy Implications

Throughout the past decade, several proposals for reforming the health care system have arisen both at a national and a state level. Although most policymakers have acknowledged an injustice in our health care system, the solutions vary among individuals and along partisan lines. The findings of the regression analysis performed suggest that reform proposals aiming to increase access to health insurance may have the greatest effect on reducing the use of emergency departments for non-urgent care. As stated in the section above, being uninsured increases a person's odds of citing the emergency room as his/her usual source of care by 610% to 873%. Three proposals for health care reform aim to increase an individual's access to health insurance: the single-payer system (previously proposed as California Senate Bill 840), the universal health care option (proposals that create a health care mandate), and the current health care bills being voted on in the United States Congress (HR 3961 and HR 3962). In the rest of this section, I analyze the current reform proposals using the findings of this thesis.

Single-Payer Health Care

Proposals for a single-payer health care system are not new. Several countries, including Canada, currently run single-payer systems and some very successfully. California Senate Bill 840, like other single-payer proposals, establishes a universal

health care system run by the government that provides insurance for every California citizen (Kuehl, 2006). The proposal creates a system much like Medi-Cal that is accessible to everyone regardless of health status, socioeconomic status, or demographic characteristics.

The intention of a single-payer reform is to increase access to health insurance for everyone while also expanding access to medical care. In theory, this reform would significantly ease the strain on emergency departments for non-urgent care by increasing an individual's access to routine health care in a primary care setting, including preventative medicine like vaccines and physicals. By eliminating private insurance, this reform also eliminates the current issue that individuals on public insurance programs have by creating a system in which everyone will have equal access to services; no one is turned down for care based on his/her insurance carrier or lack of. By creating a state-run system, this also means that physicians, hospitals, and emergency departments would be paid for every individual that is treated, decreasing the financial burden the uninsured create on health care services.

Public support for a single-payer system in California has increased over the past few years as a recent field poll suggests that a single-payer system has 36% of the support of Californians compared to 33% that supported making reforms within the current structure (DiCamillo & Field, 2007). However, the reality is that in this current political environment, reforms that call for a single-payer system are not feasible and will not garner bi-partisan support, especially at a national level. This means that if a single-payer

proposal were to ever pass, it must be done at a state level and SB 840 has not been successfully passed by the legislature and signed by the governor. Despite the fact that supporters of a single-payer system state there would be no additional costs over current health care spending, there is no concrete research on the fiscal cost to the state of California. A single-payer system would completely overhaul the state's health care industry and decrease the inequity with regard to health care access caused by income and socio-economic variables. While I think a single-payer system is the best option for relieving emergency department overcrowding, it seems inevitable that less drastic reforms, like creating insurance mandates or a public option are more suited for the current policy environment.

Universal Health Care Option

The universal health care options, like California Assembly Bill 8 and California Governor Arnold Schwarzenegger's proposal, aim to expand current public insurance programs (like Healthy Families) and create an insurance mandate requiring all individuals to have health insurance. Similar to the health care reform proposal enacted in Massachusetts, the proposals increase access to health insurance but do not expand access to quality medical care beyond the current system (Wicks, 2007). There are still the inequalities between those on public insurance and those who use private insurance, stemming from the lack of access to health care services for those publically insured. Thus, similar proposals to universal health care would not greatly reduce the use of emergency departments for non-urgent or routine medical care.

Requiring an individual to have health insurance does not guarantee access to medical services in a primary care setting. In Massachusetts, the Universal Health Care system enacted has actually done nothing as far as expanding access to medical care. Nearly 300,00 Massachusetts citizens now have access to health insurance, however there is an imbalance of primary-care physicians in the state to care for them (Sack, 2008). It is possible that despite more individuals being insured, there will be no decrease in the use of emergency departments for non-urgent medical care as there might not be any increase in the number of physicians or community clinics. While the universal health care proposals aim to increase access to health insurance, they do not do enough to increase the number of physicians and medical personnel, thus not increasing access to actual medical care. In comparison, on a single-payer system, everyone is publically insured, correcting the issue whereas physicians may not accept Medi-cal or Medi-care patients due to lack of sufficient payment. Over time, the access issue will correct itself since with a greater number of insured individuals, hospitals and physicians will receive payment for their services and will, therefore, see a decrease in unpaid medical bills. The current proposals at the national level, HR 3961 and HR 3962, aim to both increase access to health insurance but also access to care.

National Health Care Reform Proposals

The health care reform proposals mentioned in the previous sections are generally focused on reform at a state level; however, health care reform is also being discussed nationally. Since President Barrack Obama was elected, national health care reform

appears to be gaining steam. Currently, two main health care reform proposals are being debating in the House of Representatives and the Senate, HR 3961: Medicare Physician Payment Reform and HR 3962: America's Affordable Health Choices Act of 2009. The proposals for health care reform not only divide lawmakers along party lines, but also divide physicians and others in the house of medicine. If passed, the current legislation could have a significant impact on the nation's emergency departments although the changes could be both positive and negative.

The main proposals in the two health care reform bills aim to expand insurance coverage, reform the current insurance industry, and improve access and quality of health care services. In addition, the bills aim to expand and improve the quality of care in emergency departments. Specifically, HR 3962 creates emergency department pilot projects and standards to reduce overcrowding and ambulance diversion (American College of Emergency Physicians, 2009). The bills also repeal the current Medi-Care and Medi-Caid (Medi-Cal in California) physician payment schedules, granting a much needed increase in physician repayments. California ranks among the lowest states in physician reimbursement, resulting in many patients being unable to attain medical services outside of an emergency department setting.

The bills also aim to rebuild primary care services through the 5% increase in reimbursement rate and additional funding for primary care training programs (American Medical Association, 2009). This can substantially decrease the use of emergency departments for non-urgent care by giving patients greater access to primary care services

through a more coordinated system. Similar to the universal health care proposals, despite the coverage expansions, the bills do not go far enough in extending an individual's access to physicians and medical services.

III. Conclusion

The findings of this thesis indicate that demographic, socioeconomic, and health care characteristics influence an individual's medical decisions and choice to use emergency departments for non-urgent care. A significant amount of emergency department use for non-urgent care appears to be the result of a lack of alternatives. Perhaps this would not be such a dire issue if we had an emergency system that could treat those with non-urgent conditions, however our emergency departments are exhausted, overcrowded, and on the brink of collapse. Patients do not have access to all the medical services they need and this has prompted policymakers to search for solutions and quick fixes to "bandage" an ailing system. The proposals for national health care reform, while not perfect, attempt to create reforms for the areas that need it the most. But if a state with a population as large as California's cannot sustain a health care system with a large number of individuals on public programs (Medi-Cal and Healthy Families), how effective can the U.S. government be in developing a publically provided, universal health care system?

Easing the strain on emergency departments is a complicated issue, as is health care reform. While I feel that the entire health care system is in need of a complete restructuring, it is probably more feasible to reform the current system. I support the

insurance industry reforms and increased access to health insurance all the current proposals would create; but there also needs to be an increase in actual medical services and the supply of medical personnel. There needs to be an increase in the reimbursement amounts for hospitals and physicians that treat the publically insured. This would increase access to routine medical care outside of an emergency department setting for those individuals on public plans. This would relieve at least a portion of the strain on emergency departments that non-urgent use creates by creating alternatives.

The solutions discussed to reform the health care and emergency department system are what is currently being debating and new proposals will emerge. It is likely that the end result of the health care reform proposals will be a hybrid of all the proposals. Regardless, any health reform package adopted will have an impact on emergency departments whether directly or indirectly.

APPENDIX

APPENDIX

Table A1

Research Methods of Existing Literature

Authors, Publication Date	Sample Size	Recruitment of Participants	Data Collection Method	Location & Year of Study	Research Results
Baker, Stevens, & Brook (1996)	*n* = 1,049	Those visiting the emergency department	Questionnaire	Harbor-UCLA Med Ctr, California; 1990	Blacks were 1.82 times more likely than Hispanics to visit the ER more than 2 times/ year. After controlling for SES, Race/ethnicity was not statistically significant. Uninsured patients were 11.8% more likely than insured to have 2 or more ER visits.
Hong, Baumann, & Boudreaux (2007)	*n* = 936	Those visiting an urban emergency department	Survey	Not specified	African Americans and Hispanics were 1.9 and 2.2 (respectively) times more likely than whites to use the ED; After controlling for SES, race/ethnicity were not statistically significant.
Lombrail, Vitoux, Bourrillon, Brodin, & De Pouvourville (1997)	*n* = 320	Those visiting the emergency department	Interview	Robert Debre Hospital, France; 1992	N/A
McConville, & Lee (2008)	*n* = 31,224	2005 California Health Interview Survey (CHIS)	Secondary Data (telephone interviews)	Randomly selected households in California	In non-elderly adults (18-64), uninsured individuals accounted for 20% of ed visits while publically insured individuals account for 29%. Holding other factors constant, adults covered by Medi-Cal are 6% more likely than privately insured individuals use the ed.

Table A1 continued

Authors, Publication Date	Sample Size	Recruitment of Participants	Data Collection Method	Location & Year of Study	Research Results
Miller (2000)	*n* = 8,117	National Maternal & Infant Health Survey	Questionnaire	US; 1988; 1991	Poor African American children were 5 to 7 times more likely to use the ED than non-poor, non-black children holding other factors constant.
O'Brien, et al. (1997)	*n* = 1,035	Those visiting the emergency department; Cross-sectional study	Questionnaire	Rhode Island Hospital; 1994	Income, other SES variables, and health status were statistically significant
Peterson, Burstin, O'Neil, Orav, & Brennan (1998)	*n* = 320	Those visiting the emergency department with abdominal pain, chest pain or asthma	Survey	Five urban teaching hospitals in northeastern US; 1993	Individuals that visit a primary care physician were 1.6 times less likely to use the ED regardless of insurance status
Stevens, Seid, & Halfon (2006)	*n* = 19,485	2005 California Health Interview Survey (CHIS)	Secondary Date (telephone interviews)	Randomly selected households in California	Low SES and uninsured children have less access to routine care
Wall, Rhodes, & Kennedy (2002)	*n* = 98,785	1998 National Health Interview Survey (NHIS)	Secondary Data (telephone interview)	Complex sampling design	Frequent users of the ED were between 25–44 years, African American or Hispanic, less than college educated, uninsured

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