

New choices in primary care: A statistical analysis of urgent care patients

A Thesis
Presented to
The Division of History and Social Sciences
Reed College

In Partial Fulfillment
of the Requirements for the Degree
Bachelor of Arts

Kaitlyn R. Jackson

May 2016

Approved for the Division
(Sociology)

Jessica Epstein

Acknowledgements

I want to thank all of my friends and family who have cheered me on from the sidelines for the past four years. I couldn't have made it through my sophomore year, no less this thesis without you guys. Thanks also to the professors I've had at Reed. I've come out of this place a different person than when I came in, and I don't think any acknowledgment would be enough thanks.

Table of Contents

Chapter 1: Introduction	1
National Trends in the Urgent Care Industry	2
The Changing Fate of Primary Care	4
Chapter 2: Theoretical Foundations	7
Patient Choices	8
The Rise and Fall of the <i>Golden Age of Doctoring</i>	11
From patient to client	14
Chapter 3: Model Building: theories of urgent care use	19
H1: An extension of the Welfare State	20
H2: Response to Consumer Disatisfaction	22
H3: New Model of Primary Care	24
Chapter 4: Methods	27
Data	27
Variable Selection and Summary Statistics	29
<i>k</i> -Modes Cluster Analysis	29
Regression: Logistic Modeling of Urgent Care	31
Chapter 5: Analysis	35
Identifying Typologies with Clustering	35
Testing Hypotheses	39
Revisiting the hypotheses	49
Chapter 6: Conclusion	53
Appendix A	55
Appendix B	57
Bibliography	63

List of Tables

3.1	Summary of three hypotheses of urgent care centers' use.	26
5.1	Multinomial Logistic model: location effects	42
5.2	Multinomial Logistic model: demographic effects	43
5.3	Multinomial Logistic model: visit characteristics	44
5.4	Multinomial Logistic model: compared characteristics	45
5.5	Logistic model of the decision to go to urgent care.	47
5.6	Logistic model of the decision to use urgent care as primary care . . .	48
7.1	Observed Proportions of Independant Variables	56

List of Figures

1.1	Comparison of the Characteristics of Three Care Options	3
1.2	Comparison of Health Care Trends	4
5.1	Identified patient typologies of urgent care centers visits (2008-2012).	36
8.1	Sample Banner Agglomerative Clustering Results	59

Abstract

Urgent care centers are a relatively new and emergent phenomenon in the American health care system, yet little to no academic research has been performed on how they are situated in the larger sociological understanding of the healthcare system. This thesis attempts to further such an understanding by examining the typologies of patients which are the users of urgent care, and further, who of those uses such centers as their primary care physicians.

Dedication

To my family, both those I came with and those I found at Reed.

Chapter 1

Introduction

The days of having a local doctor who cared for all of a patient's health needs are long gone. In their place, a rapidly expanding and complex network of health care providers and services have developed, increasingly placing the burden on the patient to make the appropriate choice for their primary care needs. In particular, the past twenty years have seen a surge in a new type of medical practice known as urgent care centers and the industry shows no sign of slowing down. These centers have undoubtedly gained the attention of both the popular press and patients and most of us know someone with an urgent care anecdote.

Given such rapid expansion of the industry, it is surprising that little academic research has taken urgent care as its subject. In part a response to this oversight, in the following analysis I will use a nationally representative sampling of urgent care visits to examine the use patterns of these facilities in recent years. I investigate three central questions regarding urgent care: what are the typologies of patients using urgent care as their primary care providers, how can we use this information to situate urgent care centers as a viable patient option in the larger complex of the American healthcare system and what can the sociological research on patient decision processes and healthcare offer to a broader understanding of this relatively new phenomenon?

National Trends in the Urgent Care Industry

There is no official definition of what constitutes an urgent care center, but the scope of services provided generally falls between that of a primary care doctor's office and an emergency department. The centers typically focus on acute episodic care, and have a substantial emphasis on customer service. Most are open past the hours of a traditional primary care practice, and often have a wider variety of services, such as labs, x-rays and other emergency department equipment (Weinick and Betancourt 2015).

While the industry is currently experiencing rapid growth, the concept got off to a rocky start. The first urgent care centers opened in the United States in the early 1980's., with no more than a handful in operation at the time. Unfortunately, (at least as far as early investors were concerned), the industry rapidly declined, and the few clinics which had opened were largely absorbed into larger hospitals and healthcare groups. Ten years later, in the mid-1990's , the centers began expanding rapidly, growing to over 12,000 centers today. By the UCAOA's estimate, in 2014, approximately two new urgent care centers were opening in the United States each week (Becker 2011).

Such recent and rapid expansion has been heavily examined by the media, which often attribute growth to a diverse set of market factors such as long wait times for primary care appointments, crowded emergency departments and patient demand for more accessible care, including after-hours appointments (Yee, Lechner, and Boukus 2013). Yet despite the rapid development of the industry and the great interest sociologists have historically taken in America's health care system, hardly any scholarly research has been done on why these centers are coming to play a major part of the healthcare system or what their patterns of use are. While many are quick to point towards long wait times, and the difficulty of finding doctors in the current healthcare system, the repercussions of the new turn towards urgent care centers are

not well known, nor has their place in the American healthcare system been examined.

Most urgent care centers operate in metro areas, though they are not restricted to cities. The services offered are compared with hospital emergency departments and traditional primary care clinics in table 1 below, which was presented in the official state of California industry overview of urgent care compiled in 2011.

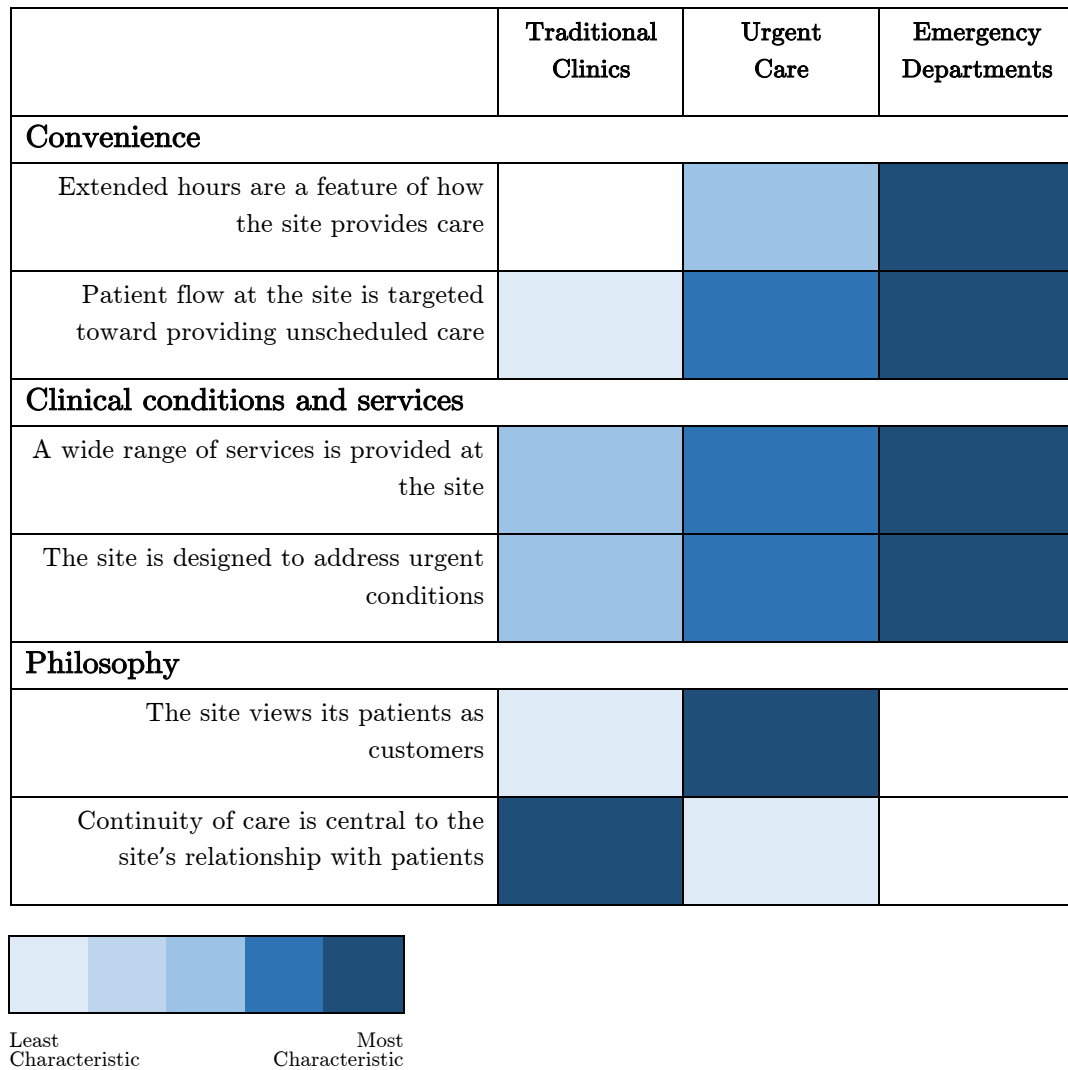


Figure 1.1: Characteristics comparison of Urgent Care, Traditional Practices and Emergency Rooms. Source: California's 2015 report on the Urgent Care Industry.

As summarized above, this clearly orients urgent care facilities towards an acute. Though this is the acceptable definition of urgent care, it is important to not

that much of this conceptualization of the industry has not caught up to the rapid changes taking place. The report took place in 2011, and even the past 3 years have seen y scholarly research has been done on why these centers are coming to play a major part of the healthcare system or what their patterns of use are. While many are quick to point towards long wait times, and the difficulty of finding doctors in the current healthcare system, the repercussions of the new turn towards urgent care centers are not well known, nor has their place in the American healthcare sy.

The Changing Fate of Primary Care

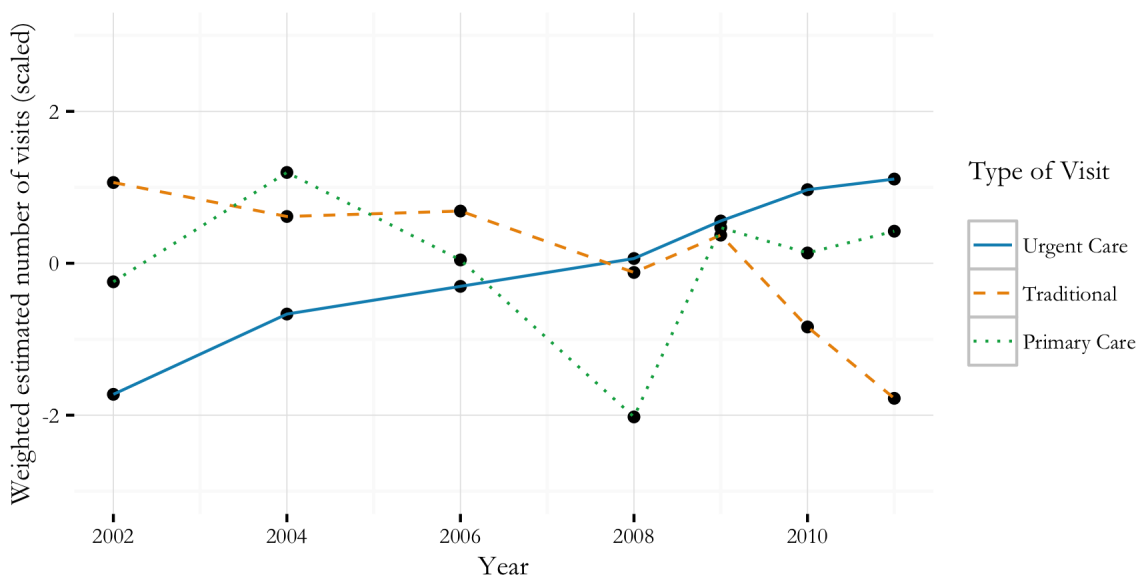


Figure 1.2: Comparison of Visit Estimates for Urgent Care, Traditional Clinics and Primary Care (2000-2011). Data from NAMCS.

Examining Trends: Fact or fiction

In the following analysis, I will attempt to situate the rise of such clinics within the existing sociological research on the American healthcare system, the changing face of primary care, and the patients that utilize it, examining hypotheses about how the

patterns of use by patients at urgent care centers can help us understand and situate them in to the larger body of medical sociological research. To do this, I draw from theories on the changing relationship between the patient and practitioner to compare three hypotheses of urgent care usage.

In Chapter one, I situate the analysis into the wider body of literature, emphasizing how structural changes in healthcare have generated profound consequences for primary care and modern patients. I begin to place urgent care centers into the context of the US healthcare system's varied actors and organizations, and explore the ways this method of care appears in the literature. In particular, the chapter highlights how these new organizations might informally facilitate the depersonalized relationship between practitioner and patient, eliminating the close ties many historical medical sociologists identified as vital to an optimal doctor patient relationship. Lastly, I identify the current gaps in the literature surrounding new forms of privatized medical care facilities which have been largely overlooked by sociologists and other scholars attempts to understand health care in America.

Chapter two focuses strictly on urgent care centers themselves, and uses sociological theory to present three plausible explanations of urgent care usage. While the goal is not to generate a predictive model of urgent care, an analysis which tests the three hypotheses by examining sub-groupings of patients who visited urgent care goes far to allowing us to recognize identifiable medical use patterns. Chapter three offers a description of the National Ambulatory Medical Care Survey where I am drawing my analysis from, and includes a description of the methods I use to examine patient visits to urgent care. These include both a k-modal hierarchical clustering exploratory analysis used to identify groups of similar patients who used urgent care and a logistic analysis of those choosing to use urgent care as their primary care facility. Chapters four and five present these analyses, and discuss the findings in light of the research.

In the conclusion, I explore the implications of the tensions between what is thought

important to the doctor-patient relationship, and the reality of accessing healthcare in America today. I argue that primary care, while no longer the traditional town doctor, is still a key gateway for patients, and that urgent care centers may just be a new entry point into the traditional model. I conclude with implications and suggestions for further studies of urgent care and primary care access in America.

Chapter 2

Theoretical Foundations

In this chapter, the quantitative exploratory analysis of urgent care centers that follows later will be located in the long-term primary care trends of patients seeking care within the American healthcare system. To comprehend the how and the why of the proliferation of urgent care centers, one must have some understanding of the complicated and tangled history of the medical profession in the US, and how institutional changes and epistemological shifts have led to the current state of affairs. The existing sociological research on the patient and practitioner, and the evolution of this relationship, are vitally important to beginning to understand how and at what level urgent care centers may be operating, since changes in the last half century have had drastic effects on this relationship.

I begin by tracing the development and subsequent decline of medical professional autonomy, paying particular attention to how structural changes dismantled the stronghold of political, economic and social power the profession claimed at its peak. I then review the current literature regarding the consequences of such structural changes on the doctor/patient relationship in the 21st century, taking up the traditional primary care physician's historical social importance. Combined, these changes lead us to the current ontologies of the American healthcare sphere where we will attempt

to situate the role of urgent care centers and the patients who use them.

Through such a sociological lens, paying particular attention to how the literature understands the factors which influence the ways that patients access primary care. From this, I turn towards an exploration of primary care itself, and its importance and role in the larger healthcare field, its influence on literature around the patient/physician relationship, and the importance of the traditional primary care physician's historical social role. An examination of the profession shows a clear peak and subsequent decline in the power of the primary care's professional dominance in recent years and their primacy in the factors which influence patient decisions, and the last portion of the background examines how structural changes may have helped to both dismantle the stronghold of political, economic and social power of the primary care physician, and what effect this may have on modern patients seeking primary care at urgent care centers.

Patient Choices

The last 30 years have seen a reconfiguration of the patient from passive recipient of care from their doctor to a critical consumer of health services (Barker 2008; Lupton et al. 1991; Timmermans and Oh 2010). Theories of medical consumerism developed from economists studying the healthcare sector, and they begin with a similar hypothesis as the economic rational choice model, assuming that patients act as rational actors in the context of a medical encounter (Timmermans and Oh 2010). In other words, individuals act in a calculated manner to engage in self-improvement or health, and they are generally skeptical about expert knowledge (Lupton 1997).

Origins of the changing patient According to the literature, this trend began to express itself in the form of solicitation of second opinions and a sense of interchangeability of medical practitioners during the 1980's, just as distrust of the industry

reached its peak (Gray 1997). The idea that patients could shop around and compare services and prices was heavily popularized, and patients increasingly began to make autonomous decisions when selecting physicians (Hibbard and Weeks 1987; Lupton et al. 1991).

Urgent care centers fit neatly into such a conceptualization of health services, and thus offer a key area of analysis in better understanding the developing roles of the consumer-patient within the larger healthcare industry. An important aspect of the research on the developing patient-consumers emphasizes the expansion of bargaining power on the part of the patient that came with the shift (Reeder 1972). A patient may now shop around the marketplace of health care, and that many are now choosing urgent care centers is undeniable given the industry's rapid expansion.

The shift towards urgent care centers undoubtedly plays some part in the transformations of the patient-practitioner relationship and the patient's role in the medical care system discussed above, but so far these consequences remain largely unknown. Fortunately, sociologists have had a long-standing concern with such professional-client interactions, particularly within medicine (Freidson 1961; Mechanic 1966), and in order to better understand what effects the shifting norms around primary care physicians may have on patients, one can look to a large body of research on how institutional and organizational environments directly affect a patient's experience in health care.

In 1963, Samuel Bloom published what would become one of the most cited sociological texts on the relationship between physicians and patients (Bloom 1965). Even the title implies a power imbalance: the patient belongs to the doctor, whom distributes his expert knowledge which is taken by the patient as truth on the basis of the profession's techno-cratic authority.

Most of the literature locates the stability of this doctor-patient relationship in the fact that the physician acts as the patient's agent, yet one can immediately recognize that urgent care centers may not be equipped to facilitate this relationship in the

same way that the traditional primary care practice is seen to (Lupton 1997). The premise of urgency in such practices, the quickness with which patients are seen, and the targeted focus on acute problems all serve to create considerable doubt towards the ability of physicians within such an organizational context to fulfill the sociological role thought so important in previous literature.

Additionally, those who study health services have recognized that a patient's medical history is a primary source of information regarding treatment, and primary care practitioners have been known to draw upon this as a valuable resource (Draper and Smits 1975; Miller et al. 2010). Urgent care centers however have no emphasis on maintaining patient-doctor ties and there is no reliable system to ensure a patient sees the same doctor even if they have been there before.

Why might patients not choose a traditioanl primary care practitioner?

Turning away from the fate of doctoring, it is important to acknowledge that the fate of primary care physicians has been reported to be hanging in the balance for quite some time. In 2005, the American College of Physicians released a report with the ominous title "The Impending Collapse of Primary Care Medicine and Its Implications for the State of the Nation's Health Care" (ACP 2006). Yet while this may seem troublesome, a large body of recent sociological literature belongs to a growing number of scholars who are challenging the importance, and even relevance, of the traditional primary care physician in modern medicine. Those who have been observing developments in the patient-physician relationship over the past 30 years argue that the last quarter of the 20th century saw a dramatic reconfiguration of society, especially in regards to health services, which has had profound effects on an individual's relationship to the healthcare system. So while some were witnessing what was, for Starr (1982), "the social transformation of medicine," and for many, "the end of the golden age of

doctoring” (McKinlay and Marceau 2002).

The Rise and Fall of the *Golden Age of Doctoring*

Since sociologists’ initial interest in studying medicine and healthcare, the discipline was deeply intertwined with studies of the sociology of professionals and professionalism. In the U.S., Doctors were seen as the paragon of the *professional*: respected, organized, in control, and above all else, firmly established in their positions. Such traits led many to study what effects this had on medical care and how such professional dominance of medical practitioners shaped what services were provided. Many found that such dominance allowed the profession to block off areas of study entirely, or to ignore diseases they did not want to pursue. Such “modern doctors” worked within a “sovereign profession” (Starr 1982), serenely dispensing both medical care and authoritative judgment. Freidson comments that before the 1970’s, U.S. medicine “was at a historically unprecedented peak of prestige, prosperity and political and cultural influence—perhaps as autonomous as it is possible for a profession to be”(1988, p.384).

At the center of this prestige was the Physician. In the traditional Parsonian model, the Physician treated patients according to generalized technical standards of treatment (universalism), enacted a specific technical focus on medical care (specificity), treated patients without emotional investment (affective neutrality), and put the patient’s welfare above their personal interests (the ‘collective’ orientation) (Parsons). Of course, even Parsons himself noted this was meant to function as a highly abstract view of the physician (1951, p.440), yet even in summary it bestows upon the doctor the scientific and moral high ground that was at one point firmly ingrained in the American psyche.

Similar views of the doctor occur profusely throughout early to mid twentieth century literature on the profession, and is even visible today, though often as either a

past to be reminisced on, or a goal to be returned to. A person's doctor, traditionally, was an extremely integrated, close, and important connection in a person's life. This was a relationship built, for some on trust, agency, and mutual understanding, while for others on power imbalance, technocratic authority and affective neutrality. When one thinks of the healthcare industry today, it is hard to call to mind the professional cohesion previously discussed. While doctors remain one of the more highly respected career choices in America, their prestige has certainly dropped since the 20th century (Heritage and Maynard 2006). The term doctor is now applicable to a wide variety of sub-professions and specialties and the medical profession has become extremely diversified. While this may not have necessitated a drastic change in the societal role of the doctor, social scientists interested in this changing relationship have identified many possible sources of erosion.

The 21st century state has switched sides

The government was an active and powerful ally in the rise of the medical profession during the 20th century (Alford, 1975). Political policies and government agencies served as buffers against what was 'legitimate' medicine and what was not, reaching the point where physicians achieved an almost monopolistic power over medical care. More than any other profession, the state served as legitimator and ally to medical professionals: state licensing for example, made it impossible for any other health care provider to legitimately practice medicine (Freidson, 1970a).

According to the literature, all of this began to unravel around the turn of the century, and in recent years the state has been transitioning towards an anti-leviathan New Right viewpoint, no longer supportive of health care (McKinlay & Marceau, 2002). This new approach avoids government intervention in economic and social life, consequently shifting the support of the state from the established medical organizations towards private interests. This shift in the primary allegiance of the

state is reflected in many areas of social policy and has been clearly illustrated in recent attempts at health care reform, such as the Affordable Care Act.

Along with the government alliance shifts, big changes to Medicare and Medicaid legislation and the growth of third-party payers and for-profit medical service corporations created conditions which further removed the doctor from their traditional roles, eroding the political and cultural influence of the profession and threatening the cultural authority and technical autonomy of medicine (Starr 1982, Freidson 1988).

Epidemiological transitions

Interestingly, one of the other most cited causes of the decline of primary care physicians, both in numbers and in prestige, is what is known as the epidemiological transition of developed countries (McKinley 2008). Medicine's rise around the middle of the 20th century coincided with the tail end of the infectious disease era. While there is academic disagreement over whether this decline was the result of medical organizations or an overall economic development, what is clear is that standards of living started to rise and Americans began to get sick *differently*. Rather than infectious diseases, which could strike anyone at any time, many argue that America has entered into a new epidemiological phase of chronic illness. According to one estimate, within 5 years (2020), an estimated 75 million Americans will have at least one chronic condition (Wu & Green, 2000).

While some could imagine that such chronic illnesses could secure the position of the primary care physician, McKinley argues that the new, chronically ill patient base is different in a fundamental way: "A well informed patient population can now obtain a proxy diagnosis on-line, or through health risk appraisals" (2008, p. 1483). Many patients know, or at least strongly suspect their ailment before ever considering a doctor and, according to McKinley, may even skip the initial diagnosis all together and immediately seek out a specialist.

Expansion of the playing field

Similarly to the retraction of government involvement, the last half of the 20th century saw a major expansion of health care actors. Physicians had the medical playing field almost entirely to themselves for most of the beginning of the 20th century, but this was no longer true as early as the 1970s. Non physician clinicians, unheard of 40 years ago, have increased dramatically in number, and what was once the sole field of the physician is now occupied by a range of actors (Starr, 1982; Cooper, Laud, & Dietrich, 1998).

This is where urgent centers enter into the game most clearly: Late 20th century changes in the organization and financing of U.S. health care opened the door for the emergence of profit driven corporate care, and created a labor market for non-physician clinicians. For clinics which can staff a nurse practitioner for a fraction of the cost of a doctor, the choice is clear. Lower costs and customer satisfaction (two of the major tenets of the urgent care model) are widely accepted as 21st century health care priorities, and the result has been a dramatic surge in the competitive medical marketplace for health care.

It should be noted that such changes may not have necessitated a loss of professional dominance. In fact, with the expansive growth on spending in the healthcare sector that the last 30 years have seen, it is plausible to imagine that doctors could have further cemented their professional medical authority. But most scholars have observed that the opposite has happened, and instead many view the past 30 years as the end of the authoritative medical professional.

From patient to client

These shifts in the professional dominance of the medical professional occurred parallel to changing norms surrounding the roles of both patients and practitioners, all of

which directly affect a patient's acquisition and utilization of primary care. In 2006, the Millis report, commissioned by the American Medical Association, was asked to review the current status of physicians in the US. In the first section, they recalled the coveted physician of memory in America:

“The general practitioner of revered memory knew his patients... and provided continuing care through the course of minor ailments and majors emergencies. His deficiencies... were partly offset by intimate knowledge of his patients, the support he gave them, and the trust and confidence his services engendered.”

Intimate knowledge like that of a family practitioner who has known his patients for years is, according to both sociological and psychological research, the basis of a functional and stable doctor-patient relationship. A major sociological conceptualization of such relationships begins by speculating that the bureaucratization of modern social institutions has had drastic consequences on an individual's relationship to others and healthcare: as opportunities for close personal contacts diminish, problems which were originally handled in familial, social, and religious contexts are said to be transferred to ‘formal sustaining practitioners’ (Mechanic 1966). In modern societies, the prescribed structure of the ‘doctor’ and the ‘patient’ then provides a legitimization for the expression of intimacy and the request for help (1996). In other words, along with physical complaints and ailments, patients have coexisting and equally important socio-emotional needs, and sociologists of medicine have viewed addressing these needs as an essential task of the primary care physician.

But transformation is visible here as well: the “doctor” has become a “provider”, the patient a “client”. Juhar (2006) uses this “demise of the Physical Exam” as an illustration of these changing roles. He believes that patient testing technologies used in modern clinics are the newest in a long line of technologies and codified procedures which allow for *diagnosis at a distance*. Markel (2006, p551) agrees with Jauhar, and presents the stethoscope as the best symbol of medical practice, “... it embodies the

essence of doctoring: using science and technology in concert with the human skill of listening to determine what ails the patient.”

But he points out that, prior to the stethoscope, physicians would place an ear directly against a patient’s chest, a practice which inspired the inventor of the stethoscope only in that he found the act ‘disgusting’ and fashioned a listening technology which he could use to listen from a distance. Markel goes on to suggest that it was perhaps the stethoscope that began the process of physically separating physicians from their patients, and that with the rise of noninvasive imaging and testing and remote technologies, that distance will only continue to grow (2006).

Consequences for health care?

In light of such research, those who study at the intersection of health and social behaviors have begun to re-examine the importance of a close-tie relationship between doctor and patient in an attempt to respond to the consumer-patient model, developing a growing body of research which seeks to define the most effective components of patient-physician interactions and to reaffirm the place of the primary care physician in modern medicine. Common to most of these studies are the elements of ‘trust, compassion, communication, and clinical competence’ (Heritage and Maynard 2006; Phillips and Bazemore 2010, others at bottom). As an example, a 2002 study on clinical outcomes for low income women over the age of forty found that women who rated highest their doctor’s ability to take care of all of their health care needs had 11 times the odds of ‘trusting their physician’ and 6 times the odds of finding their physicians ‘compassionate and communicative’, compared to those with the lowest level of comprehensiveness (O’Malley and Forrest 2002).

With the knowledge that close ties between physicians and patients have a direct impact on the perceived quality of care, the importance of examining the rise of urgent care centers become obvious. If patients are acting as rational consumers, which of

them are choosing to receive their care outside of a primary care office, and what consequences does this have for their medical outcomes? The lack of research into the characteristics of urgent care patients make it difficult to answer such questions. Indeed, as of now, there has been no academic attempt to place the rapidly growing industry within the sociology of medicine, nor does there even exist an official definition of what constitutes an urgent care center.

In the next section, three opposing hypotheses are developed regard how urgent care centers play a role in this new patient decision-making process.

Chapter 3

Model Building: theories of urgent care use

Urgent care centers are an obviously understudied phenomenon in modern medicine, and the following section applies the sociological background discussed in the last chapter to better understand their role in the healthcare system and why patients might choose to pursue primary care at such facilities. The conceptualization of urgent care as a new source of primary care for patients is contrasted against two other theories of urgent care center usage. The first applies theory to the widely matriculated explanation of urgent care by the media and health economists: that urgent care is a response to unavailability in primary care, developing out of consumer demand for quick and cost-efficient care. The second draws from the sociological research that focused on emergency departments (an oft cited cousin of urgent care centers), and explores the possibility that the industry has developed as a response to overcrowding and overuse of emergency departments in the past 20 years.

H1: An extension of the Welfare State

The prevailing theoretical understanding of urgent care centers interprets the industry's growth as a development that came out of emergency department overcrowding that began during the financial tightening of the 1980's. Thus, each clinic is often conceptualized as a smaller instance of a traditional hospital's triage center, supplying many services which one could receive at an emergency department (Anon n.d.; Mehrotra et al. 2008; Rubin 2012). One study which compared emergency department services with urgent care centers found that, for all but the most extreme care and emergent care needs, urgent care centers could handle almost all of emergency department traffic and that their services were remarkably analogous (Anon n.d.). Similarly, the unique features of emergency departments which set them apart from more traditional avenues of care such as the promise to be seen regardless of insurance coverage and the flexible hours are mirrored in most urgent care centers (Weinick and Betancourt n.d.).

Given these similarities, urgent care could in many ways be considered a response by the healthcare industry to emergency department overuse, which continue to struggle underneath a lack of resources. Suitably, the body of sociological research on emergency departments can be used to better comprehend how urgent care centers are impacting the allocation of healthcare. Many medical sociologists have analyzed the public/private divide in the healthcare industry, emphasizing the unequal quality of care received depending upon which type of health service you utilize (Dutton 1978; Luftey and Freese 2005). In response to these inequalities in the private sector, the emergency room has long been understood as a response to a stratified system, and it is largely considered a social welfare institution (Gordon 1999). "The hospital emergency department is perhaps the only local institution where professional help is mandated by law, with guaranteed availability for all persons, all the time, regardless of the problem" (Ullman, Block, and Stratmann n.d.), and was for a long time widely

considered one of the few access points into the healthcare system for very low income individuals.

Accordingly, because urgent care centers offer a similar alternative to primary care for those who cannot procure a conventional family practitioner, they can be considered an extension of a much needed welfare institution necessary to circumvent an extremely stratified healthcare industry. This becomes more credible when trends in urgent care centers are examined in conjunction with emergency departments. By all indications, the demand for emergency departments far outweighs their capacity, and this is only expected to grow in the future (Weinick 2010). Around the time that urgent care centers began to emerge in the U.S., emergency departments were seeing record breaking levels of non-acute visits, resulting in severe overcrowding and shortages (Shortcliffe). These numbers have only risen in the past 20 years, especially in urban areas with large populations of low-income residents (Anon n.d.). Not only does this rise in demand correspond to the growth of the urgent care industry, one economic analysis which took cities with comparably high levels of non-emergent ED usage and examined the effect of a growing number of urgent care centers found that cities which have seen a large growth in these facilities have statistically lower overcrowding in emergency departments (O'Malley 2013).

Thus, urgent care centers usage would be expected to closely resemble that of the emergency department, especially regarding non-emergent care. This leads to the first hypothesis which will be tested by current data on urgent care center usage. Emergency department usage has been studied by many medical professions and sociologists, with a particular focus on the ways in which it serves as a welfare institution, and a few central patterns will be used here in the comparison with urgent care centers. Primarily, the low average income of patients and high levels of uninsured visits to emergency department patients have been a steady trend in the last 30 years (Ullman et al. n.d.). Patterns of use for emergency departments also show low levels of 'returns'

(individuals who come back with the same problem) and higher traffic during hours when normal primary care physician offices are closed, such as late at night and on the weekend (Anon n.d.; O'Malley 2013; Ullman et al. n.d.). Accordingly, if like emergency departments, urgent care centers act as a welfare institution for those who cannot procure a traditional primary care physician, we would expect to see similar trends as have been observed in hospital emergency departments. These are summarized in Hypothesis 1 below.

Hypothesis 1: Urgent care centers will experience high levels of visits from uninsured and low SES patients, have low rates of second visits, and higher rates of visits during non-traditional hours (weekends).

H2: Response to Consumer Disatisfaction

What work has been done to understand the expansion of urgent care centers has largely accounted for them by citing the growing dissatisfaction and impatience of privately insured Americans who's primary care physicians are very difficult to reach. Such a view conceptualizes urgent care centers as a market response to the demand created by middle to upper class Americans with minor ailments and low level of patience. It holds that, due to the well-known emergency department issue of overcrowding (largely a consequence of hypothesis 1), urgent care centers were a demand made by the individuals attempting to avoid the emergency room. This also happens to be the most well cited reason for urgent care's popularity.

Basically, hypothesis 2 conceptualizes the urgent care center as an occurrence of boundary work by upper middle class and wealthy Americans who have been pushed out of emergency departments by low SES patients. Sociologists have long been interested in the ways that class can be defined and reconstituted through boundary work (Pachucki, Pendergrass, and Lamont 2007). Research on symbolic

boundaries—the conceptual distinctions made by social actors in categorizing people, practices, tastes, attitudes and manners—and their interactions with more durable and institutionalized social differences such as class and race has shown that individuals often use methods of exclusion through organizational settings in order to solidify social boundaries Zietsma and Lawrence 2010.

Thus, if it is true that urgent care centers are largely operationally analogous to emergency departments as is often observed, it could be that such organizations serve as an alternative for wealthy individuals who seek to socially distance themselves from a space largely inhabited by low SES patients. Such a hypothesis would explain why the industry’s rapid growth coincides with a remarkable strain on emergency departments’ capacities due to an influx of low SES patients. This explanation also accounts for the fact that urgent care centers are often more expensive due to their pay-per-service model than emergency departments (Anon n.d., Anon n.d.; Ullman et al. n.d., n.d.). Lastly, this theory offers an explanation as to why urgent care centers have developed along side of, and with many of the same services as, emergency departments Weinick et al. 2009.

If this hypothesis were the case, one would expect to observe usage trends much like Hypothesis 1, but with key differences. Primarily, regardless of insurance coverage, we should expect to see little to no low-SES users in such clinics. We would also expect to see patterns of use by the wealthy to mimic their would-be use of emergency departments, such as high volumes of visits during times when their primary care physicians are closed, emergency and injury related visits and almost no return visits.

Hypothesis 2: Urgent care centers will experience high levels of visits from high SES patients, have low rates of second visits and will have large proportions of visits which qualify as acute and emergent care during non-primary care hours.

H3: New Model of Primary Care

Yet another understanding of urgent care centers arises when one considers the larger institutional context within which the overuse of emergency departments and the boom in the urgent care industry occurred. According to medical and organizational sociologists, the institutional narrative of the American healthcare industry since the 1980's is one of privatization and the transfer of power from professionals and the government towards the private sector and market control (Waitzkin 2000). Urgent Care centers thus fall into a rapidly expanding category of new, privately funded modes of healthcare services—other examples being retail clinics, private hospitals and home care organizations—which are provided and predominantly paid for by private actors (Anon n.d.).

This framework has yet to be fully examined by scholars, but a few studies which have attempted to examine the place of urgent care centers in new healthcare markets have pointed towards such change as being highly indicative of larger changes to healthcare, highlighting the privatization phenomenon as a possible explanation in the rise in numbers of such clinics over the last two decades or so (Rubin 2012; Weinick, Bristol, and DesRoches 2009; Yee et al. 2013). Shortages in public hospital staffing and facilities and the rising cost of care in the U.S. are seen as having created both demand and an opening for a new market within healthcare, which has been filled by new forms of medical service (Weinick and Betancourt n.d.). And while the trend towards privatization has been seen at times as both a symptom of the loss of professional dominance by medical practitioners and the cause of it, the similarities in organizational structure to primary care practices cast doubt on the hypothesis that these new forms of care are simply emergency department overflow. As one analysis observed: “while urgent care reflects some similarities to emergency departments, we find that in other areas – most notably reimbursements, primary payer distribution, and physicians’ salaries – urgent care centers seem far more similar to office-based

family medicine practices” (Weinick and Bristol 2008).

Such observations lead one to a different conclusion about urgent care than those who liken the clinics to smaller triage centers created to handle emergency department overflow. Instead, urgent care centers can be conceptualized as a move by the healthcare industry towards deeper privatization, and possibly a response to medical professional authority in jeopardy. When medical sociologists first began pointing to “the end of the golden era of doctoring,” Stefan Timmermans responded by pointing to the long history of adaptability by the medical profession, which has managed to transform itself before in the wake of institutional change many times before (Timmermans, Whooley).

Consequently, if the privatization of healthcare proves to be the primary explanation of why urgent care centers are beginning to dominate the acute-care market, one would expect to see trends in use mirror those of traditional primary care physicians rather than emergency departments. Historically, primary care often acted as a first contact point for insured patients for any acute, non-emergent health concerns of these individuals (Jost 2003). While many primary care offices will accept at least a small number of Medicaid and Medicare payments, they often have a large patient base of privately insured, financially well-off individuals (Cunningham et al. 1999). Such offices are often only open during a standard work week’s hours, a facet often noted as functioning to limit access for those who cannot take off work to go to the doctor. Lastly, primary care is often set apart from other forms of care due to the relationship and medical history that develops between the doctor and patient over years of care exchange (Miller et al. 2010). Primary care physicians thus emphasize holistic view of health care, and for those patients that do have a primary doctor, they are encouraged to return to the same clinic. If urgent care facilities are to be understood as a new face on a conventional sector of the health services industry, we should expect to see this last factor of primary care present in those going to urgent

care centers. These usage trends are summarized in Hypothesis 2 below:

Hypothesis 3: *Urgent care centers will experience high levels of visits from insured patients across SES statuses, have high rates of second visits, and will not have significantly higher rates of visits on weekends.*

If such trends were observed, the urgent care center could then be understood as analogous to an emergency department for the wealthy. ?? summaries the three hypotheses:

Table 3.1: Summary of three hypotheses of urgent care centers' use.

Hypothesis	Expected
1: Welfare Apparatus	Low SES, Self-Pay/Uninsured, Return visitors
2: Consumer Dissatisfaction	Med-High SES, Private Insurance, Weekends
3: Primary Care	Med-High SES, Private/Gov Insurance, Business days

An examination and comparison of these three models is to follow, and the results strengthen the trends discussed in the literature reviewed in the last chapter. While the direct effects of so many transitions in healthcare may not be immediately effective, this thesis attempts to at least show that the effects are experienced differently based on individual's life experience.

Chapter 4

Methods

The primary goals of this analysis are to 1) offer a better understanding of the characteristics and use patterns of patients at urgent care centers and 2) to examine empirically the differences between these individuals and those who continue to use traditional means of healthcare. Given these dual interests, the analysis was performed in three stages. First, an exploratory cluster analysis was performed on an abundance of patient characteristics for those who were coded as having gone to urgent care centers. Second, the results of the cluster analysis were used to inform a logistic regression analysis which examines the significant indicators which have an affect on whether a patient will make the initial decision to go to urgent care over traditional primary care. Third, a secondary regression analysis was performed to determine differences between patients using urgent care as primary care and those who do not.

Data

An empirical exploration of the hypotheses proposed in chapter two requires data that provides an abundance of variables which may or may not be statistically important but which we cannot initially rule out, as well as a large sample size since the phenomenon is still comparatively rare when thinking about how patients access primary care in

the US. Given these initial requirements, I chose the National Ambulatory Medical Care Survey (NAMCS), which is a national survey designed and distributed by the American Center for Disease Control (CDC) to provide researchers in the medical and social science fields “accurate and reliable information about the provision and use of ambulatory medical care services in the United States” (CDC 2000–2011).

For those unfamiliar with healthcare lingo, ambulatory care is defined by the survey as health services or acute care services provided to patients on an outpatient basis (without an overnight stay). Once a year NAMCS surveys randomly selected visits to non-federal employed office-based physicians, which are collected from a representative sample of the United States’ medical care facilities. These surveys record over 500 variables on information about how the patients utilize physician services, the conditions most often treated, and the diagnostic and therapeutic services rendered, including medications prescribed. Because it is both representative of the larger trends in the United States and includes specific information regarding urgent care centers which can be used to explore that health care trend in particular, the data set serves the purposes of the current study quite well.

Some limitations to the data should be noted. There may be related errors given that as the popularity of urgent care centers have risen, so too have the number that participated in the NAMCS. In 2008, there were 842 visits surveyed compared to 1168 surveyed in 2010. There may also be a compounding factor of selection: many urgent care centers are classified as retail clinics by the CDC, and are thus not included in the NAMCS random selection pool. Even with these limitations, the CDC specifically offers the NAMCS as a tool for social scientists, and this analysis depends on their collection methods being statistically expandable.

Variable Selection and Summary Statistics

The NAMCS is a large data set: compiling observations for the years 2008-2012 generated a data set of over 100,000 observations with 547 variables. In order to explore such a large amount of data, I began the analysis by utilizing unsupervised statistical learning methods in order to develop descriptive categories of urgent care center patients. The advantages of performing an initial analysis of this nature are its ability to efficiently examine a large amount of variables and highlight those that should be included in later analyses. This choice was motivated by the current lack of statistical analysis and social theory surrounding urgent care centers, which makes it difficult to develop a model from scratch. The results of the clustering act as a guide for the regression techniques by identifying variables with some relationship to urgent care.

For the clustering, I examined the group of visits which were coded as having been at “Urgent Care Centers/Freestanding Clinics” by the NAMCS. While the combined years produced a data set of 123,120 observations, only 3,863 of those occurred at urgent care centers (about 3 percent). Of these visits, I limited the analysis to observations without missing information, bringing the sample to 3,695 visits to urgent care centers. *insert table 3.1*

k-Modes Cluster Analysis

This method allows for grouping patients that have similar characteristics across a set of variables by dividing a set of cases into ever more numerous and specific subsets, thus leading to homogeneous empirical types (Rapkin and Luke, 1993). One of the most powerful exploratory aspects of cluster analysis is that you do not need to have a response variable in order to better understand your data. For this project, this is extremely useful since we initially only know who is going to urgent care and who is

not, but would like to understand them as a group better before drawing comparisons between patients who visited a traditional primary care clinic. Another advantage for cluster analysis is that since such inductive methodologies are based only on quantitative similarities among cases, only two factors may be responsible for trends in the data: the actual structure of the observed phenomenon and the methodological decisions I made concerning choosing the cases and variables (including the statistical method used to identify subsets). A further explanation of the *k*-modes clustering performed on the data is available in Appendix 1.

Because I am interested in two somewhat distinct aspects of the patients of Urgent Care – both their demographics and their patterns of use – The clustering was performed in two batches of parameters. Variables for *Age*, *Sex*, *Race*, *Urban Type*, *% Neighborhood Poverty*, *% Neighborhood college degree attainment*, and *Payment Type*, what I will refer to as the *demographic variables* from this point forward, were first analyzed for subgroups. Secondly, some of the same variables were again analyzed with the behavior parameters of *Injury related visit (y/n)*, *Primary Caregiver*, *Seen Before?*, *Past Visits*, *Major Reason*, and *the day of the week*, what I will refer to as the *behavior parameters*. The summary statistics for these variables can be found in Table 1 of Appendix 2.

Patient and Visit Characteristics

Many of the variables chosen to include in the exploratory cluster analysis were selected with both an awareness of the historical and sociological understandings of the decision factors which affect how Americans choose their healthcare in mind and through an elimination process. Initially, 40 parameters on patient demographics and visit characteristics, along with regional data for each observation, were included in the clustering. To identify the subsets of characteristics, I began by clustering the urgent care observations using all of the initial parameters. Variables were then eliminated

which failed to effect an observation's placement within a cluster. Through this process of eliminating variables which did not cluster systematically, the parameters which are used in the following logistic regression analysis were chosen.

Regression: Logistic Modeling of Urgent Care

Following the cluster analysis, a logistic regression analysis is used in this study to examine the determinants of the odds of using urgent care as primary care. Often, sociologists and other social scientists performing quantitative analysis on a single dependent variable use a form of analysis called ordinary least squares (OLS) regression, which attempts to fit a line across a set of data points in order to best determine which independent variable has the greatest effect on determining the outcome for the dependent variable. This method works well for outcome variables which are quantifiable, however in the present study the variable of interest is binary and categorical: a person either uses the urgent care center as their primary care physician or they do not.

This creates many problems which violate the assumptions of linear models like OLS, and are the reason logistic regression was chosen instead. Logistic regression avoids the pitfalls of linear models by fitting a curved rather than a straight line to the data. This results in a better estimation of the effects of independent variables upon probabilities because the curvature of the line is able to fit the clustering of the answers at the two poles.

Operationalization and Recoding of Variables

Dependant Variables

The dependent variable analyzed in the logistic model in this study is whether or not a patient went to urgent care. Furthermore, a secondary analysis is conducted on how

the patient demographics and visit characteristics relate to whether or not the patient uses urgent care as their primary care physician. Both of these outcome variables are analyzed in light of many visit level characteristics, up to 16 in the full logistic model.

Independant Variables

The following is a description of each variables used in the logistic model, which attempts to examine their effect on the decision to use an urgent care center as the patient's primary care physician. Most of the independent variables used in the logistic regression were recoded as binary categorical variables, and the details of this recoding is discussed for each below. Table 1 in Appendix 1 contains the summary statistics for the parameters used in the models.

Injury Related Visit: Recoded as a dummy variable, where a 1 indicates that the visit was reported as being injury related and 0 meaning it was not. In the case of the survey, injury related is distinct from a visit marked as an emergency which was subsequently redirected to a hospital ER.

Weekend Visit A recoded dummy variable, where 1 indicates the visit occurred on a Saturday or a Sunday.

Established Patient A categorical variable recoded as 1 meaning "Yes, established patient" and 0 indicating either "No, new patient" or "Unknown".

Number Past Visits A continuous variable of number of past visits to the facility at which their visit was at on the day of the survey.

Visit Reason This was a categorical variable with many options. Due to the interests of this analysis, the variable was recoded as three dummy variables: a chronic condition, a new condition (considered so if less than 3 months old), and other.

Age Age was recoded into four groups of variables which correspond to age ranges.

Male A dummy variable for sex.

Race Race was recoded into four categories: "Non-Hispanic white", "Black",

“Hispanic”, “Other”.

High ZIP Income As there were no patient-level data available for socioeconomic status, SES data corresponding to the ZIP code of the patient was used as a proxy. This should be taken as a general indication of the SES makeup of the town where the patient lives, as it may not always map directly onto a patient’s own status, especially at median values.

Rural A dummy variable for whether or not the urgent care center was located in an urban or rural area.

Chapter 5

Analysis

Before examining the question of why an individual would use urgent care as their primary care physician, an exploratory cluster analysis of urgent care visits between 2008 and 2012 was performed. The goal here was not predictive; rather, for the purposes of this analysis, clustering was used as a form of reproduction—observed trends were used to generate research hypotheses which account for the observed groupings. Following this, two logistic regressions were performed on the characteristics which were identified through the clustering, with the goal of obtaining a model which addresses whether or not an individual would a) choose to go to urgent care and b) use urgent care as their primary care physician.

Identifying Typologies with Clustering

Differences in Demographic and Behavioral Factors of Urgent Care Seekers

In order to better examine the hypotheses about individuals choosing to go to urgent care, I first identified which characteristics or behaviors most distinguished subgroups of urgent care patients in the cluster analysis. Testing the cluster analysis on critical demographic characteristics and visit behaviors that were discussed in the

theory previously revealed clusters which qualitatively fit all three of the theoretical case profiles. The cluster analysis makes immediately clear that there are distinct homogeneous groups within the selection of patients who utilize urgent care. Figure 1 on the following page illustrates the observed sub-groups.

Hypothesis	Primary Care	Payment	Urban/Rural	% Poverty	% Degree	Age	Seen Before	Past Visits	Reason
1	No	Private	Large metro	Q2 (5-10%)	Q4 (>32%)	25-44 years	Est. Patient	2	New Problem
	No	Private	Large metro	Q1 (<5%)	Q3 (20-32%)	15-64 years	New Patient	NA	New Problem
2	No	Medicare	Rural	Q3 (10-20%)	Q2 (12-20%)	45-64 years	Est. Patient	3	Chronic/Routine
	Yes	Medicare	Large metro	Q4 (>20%)	Q1 (<12%)	>75	Est. Patient	10	Chronic/Routine
3	Yes	Private	Medium metro	Q3 (10-20%)	Q1 (<12%)	25-44 years	Est. Patient	2	Chronic/Routine
	Yes	Private	Large metro	Q2 (5-10%)	Q3 (20-32%)	45-64 years	Est. Patient	2	Chronic/Routine
	No	Private	Large fringe metro	Q1 (<5%)	Q4 (>32%)	Under 15 years	Est. Patient	1	Chronic/Routine

Figure 5.1: Identified patient typologies of urgent care centers visits (2008-2012).

Beginning with demographic trends, the characteristics which were *not* identified as distinguishable in the sample by the clustering (and were thus not included in Table 1.) offer just as much, if not more insight as those that did result in fractioning. Race in particular was immediately noticeable for its lack of variety: of the initial clusters, all were predominantly or exclusively white, an unsurprising trend when one looks at the summary statistics (of the 3863 urgent care visits included in the data, 87% of those were white individuals). This is substantively interesting for several reasons, mainly in that race is a known correlate with many other socioeconomic indicators, and urgent care appears to be largely utilized by white patients.

Similarly, no significant clusters of patients going on weekends were identified, nor were any of the major clusters' visits injury related. These observations together seem to counter the typical view of urgent care, and coupled with the fact that only 25% of the urgent care visits were coded as new visits, there are obvious indications that urgent care is being used in ways other than those proposed by hypothesis 1.

Since the data set lacked individual level socioeconomic data, we can examine the socioeconomic indicators for the patients' ZIP codes which were included as demographic parameters proxies. Unsurprisingly, these appeared to cluster and correlate with both race and income: for both males and females, there were consistent clusters of White, 25-44-year-old patients with private insurance, and both of these clusters were in the highest quartile of percent population with Bachelor's degrees, the second lowest percent population under the poverty line (5-10%), and both visited clinics coded as being located in a "Large central metro" (Table 1.).

In fact, if one predominant trend becomes clear from the demographic clustering, it is that urgent care centers are almost entirely an urban affair. Of the clusters found, all but one consisted of visits located in medium to large metros, indicating that while other variation between patients exists, most urgent care consumers are located in larger cities. And if its singularity wasn't enough, the cluster of visits which did occur in a rural setting also differed from most other clusters in the other parameters as well. As can be seen in the first row of Table 1., the rural cluster of visits had one of the highest levels of localized poverty, one of the lowest levels of educational attainment, and was one of only two clusters where a significant number of visits were paid with medicare.

Also informative are the clusters' most occurring payment types, which complicate some of the theoretical notions of urgent care described in Chapter 1. While the largest clusters were consistently comprised of private insurance payers, Medicare without a doubt plays a role in getting people to urgent care centers. Medicare was listed as the primary payment method around 18 % of the time, a large number when one considers the consumerist theories proposed in chapter one. These clusters are crucial to understanding the decision process behind choosing a health care provider, while simultaneously raising the question of the relationship between the surprising number of elderly patients on Medicare seeking treatment at an urgent care centers.

The demographic characteristics of urgent care seekers were also clustered with behavioral, visit-level parameters in a second wave of cluster analysis, in order to to examine *how* urgent care is utilized by different groups. By far the largest and most homogeneous clusters isolated consist of white, privately insured patients in medium to large urban environments. These trends match those found in the demographic clusters, and we can learn even more about this group by examining the cluster segmentation that occurred across their behavioral parameters in the second wave. Of the two clusters which consist almost entirely of white, 25-44-year-old men and women, both were almost entirely classed as “established patients”, with at least one past visit. Also theoretically interesting, neither cluster had observations whose reason for visiting was “injury related” and neither had recorded visits on weekends. Clusters 5 and 6 in particular (Rows 5 and 6, Table 1), consisted of 25-64-year-old white patients with private insurance, an established history of visiting urgent care, and a reason for their current visit coded as a “chronic, routine problem”.

In fact, only one cluster of visits in the final model were coded as new patients, though it is a sizable fraction of the whole. Examining these two clusters reveals what I referred to earlier as the traditional patient characteristics ascribed to urgent care visits. These two cluster show what many would expect, both consisted of white, privately insured, new patients, and both clusters contain the only observations which occurred on a weekend or were coded as injury related. These characteristics are in line with what many hold as the purpose of urgent care centers, but they remain a small fraction of the recorded number of visits. Completely contradicting this idea, the other seven of the nine clusters identified have high levels of established patients with chronic or routine problems, with ages ranging for 15 to over 75.

As for the Medicare question, if the clusters which consist of primarily elderly patients are examined, we can begin to understand a little better the relatively large percentage of what many would consider non-emergent care utilizers and their

relationship to urgent care. Cluster 5 consists entirely of white patients over 74, whose visits were recorded as routine and who have a minimum of 3 past visits at the same center. Cluster three on the other hand has a slightly younger age range, and the majority of patients indicated that the urgent care center was *not* their primary care. Also distinguishing, cluster three is the only cluster with a majority of rural observations. When compared, it appears that there are two typologies of elderly urgent care seekers, the first of which may be using urgent in much the same ways as the younger and larger clusters of privately insured urbanites, while the second seems to rely on urgent care much more as an actual resource for urgent problems.

In the end, the observed typologies appear to correspond relatively well with all three hypotheses presented, with the exception of a relatively large number of very young urgent care goers who did not list it as their primary care physician. The explanation for this is probably as simple as them having a pediatrician, and using urgent care as a quick supplement, which somewhat supports hypothesis 3. What the cluster analysis really does is inform the analysis about which variables were identified as important to urgent care seekers. Using these, we can now turn to a logistic regression in order to understand better how each parameter influences decisions regarding urgent care

Testing Hypotheses

I test the hypotheses presented in the previous chapter using a series of logistic and multinomial logistic regressions. I find that while the data shows evidence for the first two theories, there is little evidence to support the theory that urgent care is being used solely as is often stated in the press. There appears to be clear significant indicators for individuals choosing to use urgent care as their primary care facility which follow the first hypothesis presented in the previous chapter. The data shows

that for specific demographics, urgent care is a viable option for their primary care needs, adding evidence to the shifting tides of American primary care.

Multinomial Logistic Regression Analysis

The multinomial logistic regression tests the effect of our independent variables on four outcomes: 1) a visit to a traditional clinic whom the patient does *not* identify as their primary care provider, 2) a visit to a traditional clinic whom the patient identifies as their primary care provider, 3) a visit to urgent care, not identified as the patient's primary care facility, and finally 4) a visit to urgent care where the patient identified the facility as their primary care provider.

In order to understand the results of a multinomial logistic regression, it is important to keep in mind the reference group. Here, the group of patients whose visits occurred at traditional practices, but who did not identify that practice as their primary care provider was used as the reference group. Thus, the three models show the effects for each of the independent variables for the three other decisions in comparison to that initial reference point. The results of the regression are summarized in Tables 4.4-4.6.

The demographic characteristics of urgent care seekers were also clustered with behavioral, visit-level parameters in a second wave of cluster analysis, in order to examine *how* urgent care is utilized by different groups. By far the largest and most homogeneous clusters isolated consist of white, privately insured patients in medium to large urban environments. These trends match those found in the demographic clusters, and we can learn even more about this group by examining the cluster segmentation that occurred across their behavioral parameters in the second wave. Of the two clusters which consist almost entirely of white, 25-44-year-old men and women, both were almost entirely classed as "established patients", with at least one past visit. Also theoretically interesting, neither cluster had observations whose reason for visiting was "injury related" and neither had recorded visits on weekends. Clusters 5

and 6 in particular (Rows 5 and 6, Table 1), consisted of 25-64-year-old white patients with private insurance, an established history of visiting urgent care, and a reason for their current visit coded as a “chronic, routine problem”.

Table 5.1: Multinomial Logistic model: location effects

	Traditional	UC Primary	Urgent Care
(Intercept)	0.36*** (0.02)	-3.71*** (0.09)	-2.68*** (0.05)
‘PCTPOVRHigh ZIP Poverty‘	-0.02 (0.02)	0.02 (0.09)	-0.07 (0.07)
‘HINCOMERHigh ZIP Income‘	0.06*** (0.02)	-0.36*** (0.09)	-0.32*** (0.06)
‘PBAMORERHigh ZIP Education‘	0.22*** (0.02)	0.14 (0.08)	0.31*** (0.06)
‘URBANRURMedium Metro‘	0.19*** (0.02)	0.51*** (0.10)	0.48*** (0.06)
‘URBANRURLarge Metro‘	0.08*** (0.02)	0.37*** (0.10)	-0.35*** (0.07)
AIC	153956.44	153956.44	153956.44
BIC	154126.79	154126.79	154126.79
Log Likelihood	-76960.22	-76960.22	-76960.22
Deviance	153920.44	153920.44	153920.44
Num. obs.	95234	95234	95234

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

In fact, only one cluster of visits in the final model were coded as new patients, though it is a sizable fraction of the whole. Examining these two clusters reveals what I referred to earlier as the traditional patient characteristics ascribed to urgent care visits. These two clusters show what many would expect, both consisted of white, privately insured, new patients, and both clusters contain the only observations which occurred on a weekend or were coded as injury related. These characteristics are in line with what many hold as the purpose of urgent care centers, but they remain a small fraction of the recorded number of visits. Completely contradicting this idea, the other seven of the nine clusters identified have high levels of established patients with chronic or routine problems, with ages ranging from 15 to over 75.

As for the Medicare question, if the clusters which consist of primarily elderly patients are examined, we can begin to understand a little better the relatively large percentage of what many would consider non-emergent care utilizers and their relationship to urgent care. Cluster 5 consists entirely of white patients over 74, whose visits were recorded as routine and who have a minimum of 3 past visits at the

Table 5.2: Multinomial Logistic model: demographic effects

	Traditional	UC Primary	Urgent Care
(Intercept)	0.44*** (0.02)	-3.74*** (0.09)	-2.53*** (0.06)
AGE	0.00 (0.00)	0.00 (0.00)	-0.01*** (0.00)
SEXFemale	0.06*** (0.01)	0.19** (0.06)	-0.01 (0.04)
RACERBlack	-0.21*** (0.02)	0.19* (0.09)	-0.35*** (0.08)
RACEROther	-0.19*** (0.03)	0.03 (0.14)	-0.41*** (0.12)
PAYTYPERMedicaid	-0.63*** (0.02)	0.03 (0.10)	-0.17* (0.07)
PAYTYPERMedicare	0.53*** (0.02)	0.42*** (0.08)	0.65*** (0.06)
‘PAYTYPERWorker’s Comp’	1.19*** (0.09)	1.14*** (0.30)	3.05*** (0.12)
‘PAYTYPERSelf-Pay/Other’	0.32*** (0.03)	0.65*** (0.10)	0.51*** (0.08)
AIC	151611.81	151611.81	151611.81
BIC	151867.34	151867.34	151867.34
Log Likelihood	-75778.91	-75778.91	-75778.91
Deviance	151557.81	151557.81	151557.81
Num. obs.	95234	95234	95234

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 5.3: Multinomial Logistic model: visit characteristics

	Traditional	UC Primary	Urgent Care
(Intercept)	1.55*** (0.03)	-3.46*** (0.13)	-1.29*** (0.05)
INJURYYes	0.49*** (0.03)	0.32** (0.10)	1.03*** (0.06)
MAJORRoutine	0.61*** (0.02)	-0.29*** (0.08)	-0.01 (0.06)
MAJORChronic	1.24*** (0.02)	0.18** (0.07)	0.88*** (0.05)
‘SENBEFORYes, established patient‘	-1.64*** (0.03)	-0.00 (0.14)	-1.86*** (0.06)
PASTVIS	-0.01*** (0.00)	0.00 (0.00)	-0.01*** (0.00)
WEEKENDYES	-0.40*** (0.07)	-0.19 (0.27)	1.03*** (0.12)
AIC	142939.53	142939.53	142939.53
BIC	143138.27	143138.27	143138.27
Log Likelihood	-71448.76	-71448.76	-71448.76
Deviance	142897.53	142897.53	142897.53
Num. obs.	95234	95234	95234

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

same center. Cluster three on the other hand has a slightly younger age range, and the majority of patients indicated that the urgent care center was *not* their primary care. Also distinguishing, cluster three is the only cluster with a majority of rural observations. When compared, it appears that there are two typologies of elderly urgent care seekers, the first of which may be using urgent in much the same ways as the younger and larger clusters of privately insured urbanites, while the second seems to rely on urgent care much more as an actually resource for urgent problems.

In the end, the observed typologies appear to correspond relatively well with all three hypotheses presented, with the exception of a relatively large number of very young urgent care goers who did not list it as their primary care physician. The explanation for this is probably as simple as them having a pediatrician, and using urgent care as a quick supplement, which somewhat supports hypothesis 3. What the cluster analysis really does is inform the analysis about which variables were identified

	TraditionalUC	PrimaryUrgent	CareTraditionalUC	PrimaryUrgent	CareTraditionalUC	PrimaryUrgent	CareTraditionalUC	PrimaryUrgent	Care			
Intercept	0.36*** (0.02)	-3.71*** (0.09)	-2.68*** (0.05)	0.44*** (0.02)	-3.74*** (0.09)	-2.53*** (0.06)	1.55*** (0.03)	-3.46*** (0.13)	-1.29*** (0.05)	1.25*** (0.04)	-4.05*** (0.18)	-1.23*** (0.09)
High ZIP Poverty	-0.02 (0.02)	0.02 (0.09)	-0.07 (0.07)							0.02 (0.02)	-0.03 (0.09)	-0.09 (0.07)
High ZIP Income	0.06*** (0.02)	-0.36*** (0.09)	-0.32*** (0.06)							0.10*** (0.02)	-0.32*** (0.09)	-0.28*** (0.07)
High ZIP Educ	0.22*** (0.02)	0.14 (0.08)	0.31*** (0.06)							0.16*** (0.02)	0.12 (0.08)	0.31*** (0.06)
Medium Metro	0.19*** (0.02)	0.51*** (0.10)	0.48*** (0.06)							0.21*** (0.02)	0.51*** (0.10)	0.49*** (0.06)
Large Metro	0.08*** (0.02)	0.37*** (0.10)	-0.35*** (0.07)							0.13*** (0.02)	0.37*** (0.10)	-0.32*** (0.07)
Age				0.00 (0.00)	0.00 (0.00)	-0.01*** (0.00)				-0.00 (0.00)	0.00 (0.00)	-0.01*** (0.00)
Sex (1 = Female)				0.06*** (0.01)	0.19** (0.06)	-0.01 (0.04)				0.12*** (0.01)	0.21*** (0.06)	0.08 (0.04)
Race, Black				-0.21*** (0.02)	0.19* (0.09)	-0.35*** (0.08)				-0.23*** (0.03)	-0.32*** (0.10)	-0.32*** (0.08)
Race, Other				-0.19*** (0.03)	0.03 (0.14)	-0.41*** (0.12)				-0.22*** (0.04)	0.05 (0.14)	-0.32*** (0.12)
Payment, Medicaid				-0.63*** (0.02)	0.03 (0.10)	-0.17* (0.07)				-0.50*** (0.03)	0.03 (0.10)	-0.10 (0.08)
Payment, Medicare				0.53*** (0.02)	0.42*** (0.08)	0.65*** (0.06)				0.53*** (0.02)	0.37*** (0.08)	0.61*** (0.06)
Payment, Work Comp				1.19*** (0.09)	1.14*** (0.30)	3.05*** (0.12)				1.04*** (0.10)	0.94*** (0.31)	2.70*** (0.13)
Payment, Other				0.32*** (0.03)	0.65*** (0.10)	0.51*** (0.08)				0.19*** (0.03)	0.62*** (0.10)	0.37*** (0.08)
Injury							0.49*** (0.03)	0.32** (0.10)	1.03*** (0.06)	0.44*** (0.03)	0.30*** (0.10)	0.68*** (0.06)
Visit, Routine							0.61*** (0.02)	-0.29*** (0.08)	-0.01 (0.06)	0.62*** (0.02)	-0.30*** (0.08)	-0.02 (0.06)
Visit, Chronic							1.24*** (0.02)	0.18** (0.07)	0.88*** (0.05)	1.16*** (0.02)	0.12 (0.07)	0.80*** (0.05)
Est. Patient							-1.64*** (0.03)	-0.00 (0.14)	-1.86*** (0.06)	-1.67*** (0.03)	0.00 (0.14)	-1.84*** (0.06)
No. Past Visits							-0.01*** (0.00)	0.00 (0.00)	-0.01*** (0.00)	-0.01*** (0.00)	0.00 (0.00)	-0.01*** (0.00)
Weekend							-0.40*** (0.07)	-0.19 (0.27)	1.03*** (0.12)	-0.33*** (0.07)	-0.16 (0.27)	1.26*** (0.12)
AIC	153956.44	153956.44	153956.44	151611.81	151611.81	151611.81	142939.53	142939.53	142939.53	139918.91	139918.91	139918.91
BIC	154126.79	154126.79	154126.79	151867.34	151867.34	151867.34	143138.27	143138.27	143138.27	140486.76	140486.76	140486.76
Log Likelihood	-76960.22	-76960.22	-76960.22	-75778.91	-75778.91	-75778.91	-71448.76	-71448.76	-71448.76	-69899.46	-69899.46	-69899.46
Deviance	153920.44	153920.44	153920.44	151557.81	151557.81	151557.81	142897.53	142897.53	142897.53	139798.91	139798.91	139798.91
Num. obs.	95234	95234	95234	95234	95234	95234	95234	95234	95234	95234	95234	95234

***p < 0.001, **p < 0.01, *p < 0.05

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 5.4: Multinomial Logistic model: compared characteristics

as important to urgent care seekers. Using these, we can now turn to a logistic regression in order to understand better how each parameter influences decisions regarding urgent care

Logistic Regression Analysis

The initial exploratory analysis shows clear typologies of urgent care seekers which align with the hypotheses presented in the previous chapter, and the next phase of the analysis uses those trends and tests for significance using logistic regression analysis. Tables 5.1 and 5.2 show the results of the two logistic regression models.

The first table is a model of the initial decision to go to urgent care. For the odds of choosing to go to urgent care over other means of ambulatory care, there is no significance for whether or not the visit is injury related, and whether or not it is a weekend. This supports the observations from the cluster analysis, and provides further evidence against the demand oriented hypothesis. Similarly, visits for routine and chronic issues have a higher chance of leading to an urgent care visit than problems less than 3 mos old. These trends both support Hypothesis 3: that urgent care centers are being used as a new mode of primary care.

For the second analysis, the outcome is no longer whether or not the visit was *at* urgent care, but whether or not an urgent care patient listed the urgent care center as their “Primary Health Provider”. Interestingly, most of the significant variables’ effects change direction when this is taken as the outcome. While high local income levels had a negative relationship with the decision to go to urgent care, it appears to very positively correlate with those who do use urgent care as their primary care.

Many of the visit-specific variables that did not have a significant effect on the odds of choosing urgent care became significant when looking at urgent care as primary care. Unsurprisingly, whether or not the visit was injury related has a negative effect

	Model 1	Model 2	Model 3
Intercept	-3.69*** (0.06)	-3.04*** (0.09)	-3.13*** (0.11)
Injury Related Visit	0.11* (0.04)		-0.01 (0.05)
Weekend Visit	0.06 (0.05)		-0.10 (0.07)
Medicaid	0.02 (0.03)		-0.03 (0.04)
Medicare	0.29*** (0.05)		0.26*** (0.05)
SelfPay	-0.34*** (0.04)		-0.36*** (0.04)
Established Patient	0.06 (0.04)		0.06 (0.04)
Number Past Visits		0.49*** (0.05)	0.48*** (0.05)
Visit Reason: Preventative		0.99*** (0.10)	1.04*** (0.10)
Visit Reason: Routine/Chronic		-0.13* (0.06)	-0.19** (0.06)
Age: Working		0.10* (0.04)	0.13* (0.06)
Age: Retired		0.23*** (0.05)	0.21*** (0.05)
Male		-0.43*** (0.08)	-0.44*** (0.08)
Race: White		-0.00 (0.00)	-0.00 (0.00)
High ZIP Income		-0.56*** (0.06)	-0.55*** (0.06)
Rural		-0.09* (0.04)	-0.08* (0.04)
AIC	31001.63	30698.93	30588.75
BIC	31069.06	30795.26	30742.88
Log Likelihood	-15493.81	-15339.47	-15278.38
Deviance	30987.63	30678.93	30556.75
Num. obs.	112722	112722	112722

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 5.5: Logistic model of the decision to go to urgent care.

	Model 1	Model 2	Model 3
Intercept	-0.06 (0.13)	-4.58*** (0.25)	-3.62*** (0.29)
Injury Related Visit	-0.36*** (0.10)		-0.28* (0.12)
Weekend Visit	-0.01 (0.11)		0.05 (0.17)
Medicaid	-0.30*** (0.08)		-0.16 (0.09)
Medicare	-0.35** (0.11)		-0.43*** (0.12)
SelfPay	-0.21* (0.09)		-0.21* (0.10)
Established Patient	-0.95*** (0.10)		-0.94*** (0.11)
Number Past Visits		-0.63*** (0.13)	-0.50*** (0.13)
Visit Reason: Preventative		-1.02** (0.32)	-1.12*** (0.33)
Visit Reason: Routine/Chronic		3.69*** (0.22)	3.63*** (0.23)
Age: Working		0.02*** (0.00)	0.02*** (0.00)
Age: Retired		1.04*** (0.13)	1.10*** (0.14)
Male		-0.32*** (0.09)	-0.31** (0.09)
Race: White			-0.03 (0.14)
High ZIP Income			-0.20 (0.15)
Rural			-0.25 (0.14)
AIC	4027.38	3611.24	3507.18
BIC	4070.48	3654.34	3605.69
Log Likelihood	-2006.69	-1798.62	-1737.59
Deviance	4013.38	3597.24	3475.18
Num. obs.	3488	3488	3488

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 5.6: Logistic model of the decision to use urgent care as primary care

on the odds of the patient specifying that clinic as their primary care.

There are some surprising trends in the secondary logistic model which deserve further study. Established patient, for example, have a significant negative correlation with the odds of a patient using urgent care as their primary care physician, as did number of past visits. A further look into the structure of the data reveals a plausible explanation: while 94% of patients who listed the urgent care center as their primary care physician were recorded as Established patients, this group as a whole only constitutes a third of the total number of visits to urgent care. In other words, there were two-thirds as many urgent care visits who were established patients, yet did *not* list the facility as their primary care office, and this trend is similar for number of past visits.

Revisiting the hypotheses

Returning to the theoretical explanations for urgent care, it appears that while no one theory explains the totality of urgent care center usage, I observed much more evidence for hypotheses 1 and 3 than for 2—unsurprising given that the theory behind hypothesis two is the one most often cited in popular press stories about urgent care. There seems to be plenty of observable evidence to support hypothesis 3: there were a number of clusters which not only corresponded to the predicted trends for that hypothesis, but which directly stated that they use urgent care as their primary care provider.

In fact, only 32 visits in the example model were coded as new patients (Figure 2, purple and orange), and examining these two clusters reveals what I referred to earlier as the traditional patient characteristics ascribed to urgent care visits. These two cluster show what many would expect, both consisted of white, privately insured, new patients, and both clusters contain the only observations which occurred on a

weekend or were coded as injury related. These characteristics are in line with what many hold as the purpose of urgent care centers, but they remain a small fraction of the recorded number of visits. Completely contradicting this idea, the other seven of the nine clusters identified have high levels of established patients with chronic or routine problems, with ages ranging for 15 to over 75.

As for the Medicare question, if the clusters which consist of primarily elderly patients are examined—rows 5 and 9 in Table 2 (Figure 2, magenta and blue)—we can begin to understand a little better the relatively large percentage of what many would consider non-emergent care utilizers and their relationship to urgent care. Cluster 5 consists entirely of white patients between 65 and 74, whose visits were recorded as routine and who have a minimum of 3 past visits at the same center. Cluster nine on the other hand has a slightly older age range of above 75, and visits which were all considered new problems. Also distinguishing, cluster nine is the only cluster with a majority of rural observations. When compared, it appears that there are two typologies of elderly urgent care seekers, the first of which may be using urgent in much the same ways as the younger and larger clusters of privately insured urbanites, while the second seems to rely on urgent care much more as an actual resource for urgent problems.

The question remains how the observed trends align with the literature that assess the ways Americans are accessing healthcare in an increasingly changing market. From the exploratory analysis outlined above, it is possible to use the findings to test the hypotheses outlined in Chapter 1. In doing so, we compare our set of urgent care visitors to the larger set of observations in the NAMCS that chose traditional means of accessing primary care, testing the parameters which appeared to cluster together within urgent care seekers as possible predictors for urgent care as an outcome (actually, is this something we want to do? I've somewhat done this already way back when and most are significant, esp. white, urban, etc. but it might be interesting to

take something like chronic routine problem and see what coefficient I get?).

In order to understand the results of a multinomial logistic regression, it is important to keep in mind the reference group. Here, the group of patients who's visits occurred at traditional practices, but who did not identify that practice as their primary care provider was used as the reference group. Thus, the three models show the effects for each of the independent variables for the three other decisions in comparison to that initial reference point. The results of the regression are summarized in Tables 4.4-4.6.

The demographic characteristics of urgent care seekers were also clustered with behavioral, visit-level parameters in a second wave of cluster analysis, in order to examine *how* urgent care is utilized by different groups. By far the largest and most homogeneous clusters isolated consist of white, privately insured patients in medium to large urban environments. These trends match those found in the demographic clusters, and we can learn even more about this group by examining the cluster segmentation that occurred across their behavioral parameters in the second wave. Of the two clusters which consist almost entirely of white, 25-44-year-old men and women, both were almost entirely classed as "established patients", with at least one past visit. Also theoretically interesting, neither cluster had observations whose reason for visiting was "injury related" and neither had recorded visits on weekends. Clusters 5 and 6 in particular (Rows 5 and 6, Table 1), consisted of 25-64-year-old white patients with private insurance, an established history of visiting urgent care, and a reason for their current visit coded as a "chronic, routine problem".

Chapter 6

Conclusion

In this thesis, I have attempted to examine the relatively new phenomenon of urgent care centers and their use patterns, reviewing where the sociology of medicine has been and where the American health care system is now. While the analysis was limited by the data availability, the observed groupings of urgent care patients and the significant factors for the decision to use it as urgent care allow us to begin to answer questions about who's going to urgent care and their reasoning.

With the rapidly increasing amount of data, further research into urgent care centers could benefit from a times series study, in order to answer some of the questions raised about whether or not patient behavior is changing or just dispersing. Additionally, there are an increasing number of health care practices which resemble urgent care, retail clinics located inside large stores being just one example, that could shed further light on the modern patient as a health consumer.

Lastly, I wonder if there is a way to connect what is sociologically interesting about this topic to broader trends beyond medicine/health care. For example, you tie your narrative very tightly to literature on professionalism. If you extend that theme, is there anything that the replacement of established doctors by a direct care model reveals about other trends like, say, the rise of Massive Open Online Courses (in

higher education), the challenge to traditional accountants by institutions like H&R Block and TurboTax, or the decline of professional journalists and the emergence of bloggers? Perhaps this is too random, but if somewhere in your intro or conclusion you can speculate on broader connections about living in an on-demand society where traditional boundaries of expertise and training are increasingly blurred, your study could appeal to a more general audience.

Appendix A

Table 7.1: Observed Proportions of Independent Variables

Variable	Category	Percentage
Sex	Female	57.1
	Male	42.9
AgeGroup	15-24 years	8.68
	25-44 years	22.89
	45-64 years	29.63
	65-74 years	13.93
	75 years and over	12.58
	Under 15 years	12.3
Race	Black	9.15
	Other	3.87
	White	86.98
PaymentType	All sources of payment are blank	0.44
	Medicaid	10.67
	Medicare	26.37
	No charge	0.58
	Other	3.07
	Private insurance	46.9
	Self-pay	4.86
	Unknown	1.93
	Worker's compensation	5.17
UrbanCategory	Large central metro	24.6
	Large fringe metro	14.62
	Medium metro	34.55
	Micropolitan/noncore (nonmetro)	15.98
	Missing data	0
	Small metro	10.25
PercentPoverty	Missing data	0
	Quartile 1 (Less than 5.00 percent)	18.16
	Quartile 2 (5.00-9.99 percent)	30.24
	Quartile 3 (10.00-19.99 percent)	39.22
	Quartile 4 (20.00 percent or more)	12.38

Appendix B

K-modes / Why cluster?

In the supervised learning world, the data in question has an obvious response variable, which is tested against a null hypothesis based on theory. For this case, we do not know exactly what the outcome of interest is for those patients who went to urgent care, rather we are interested in the characteristics of who is choosing to go there. For such a data set, clustering methods allow us to examine the data in an *unsupervised* manner — mainly in that we let the statistical software find the patterns rather than test for patterns at the start.

Methodological Considerations

To perform the analysis on the data, four key methodological decisions were made by following either statistical convention or similar previous analyses. All variables were re-coded as dummy variables, and the distances between these were standardized on a scale from 0 to 1, so as to prevent any skewness which might result. Second, I chose to use the measure of distance known as the Jaccard method, which is specifically created to measure the distance between 0 to 1 scaled variables. It also has the unique feature of not including as significant pairs which both have 0 for a parameter. This is substantively important since though two visits may both have 0's for Private Insurance for example, the fact that they both don't have private insurance is not enough to consider them theoretically similar by negation: one may be on medicare while the other may be uninsured. Third, for the actual groupings themselves, I

have chosen the standard Ward's method, which attempts to minimize the variance within groups and thus maximizes the homogeneity. Fourth, in keeping with similar exploratory analyses, I have limited the clusters to a theoretically interesting number while keeping a manageable representation of reality.

Determining the number of Clusters

Because urgent care centers have been greatly ignored by sociologists studying medical practices, there was little theoretical guidance in selecting a likely number of subgroups for the analysis. Similarly, because I am interested in understanding how an unsupervised analysis of patient data will reveal trends, it was particularly important to the analysis that the number of clusters were both mathematically achievable and substantively small enough for analysis.

To accomplish this, I began with hierarchical clustering of the random samples chosen from the data. Using a mixed-methods tool to calculate the distance matrix between the various observations, I placed each point into an algorithm which subsequently minimized the variance between clusters. Figure 1 shows the dendrogram for the initial agglomerative cluster methods for the behavioral variables.

The white lines extending to the right represent clusters which differ from each other. After running the bottom up clustering method for a number of trials, the agglomerative coefficient was always between .73 and .8, indicating that as the height for which the clusters should stop combining. Again, Figure 1 demonstrates that at that height, around 8 clusters are clearly separated.

Hierarchical Clustering with Categorical Variables

Because urgent care centers have been significantly overlooked by sociologists studying medical practices, there was little theoretical guidance in selecting a likely number of subgroups for the cluster analysis, often the first step in such examinations. Similarly,

Banner of `agnes(x = dsy1, method = "complete")`

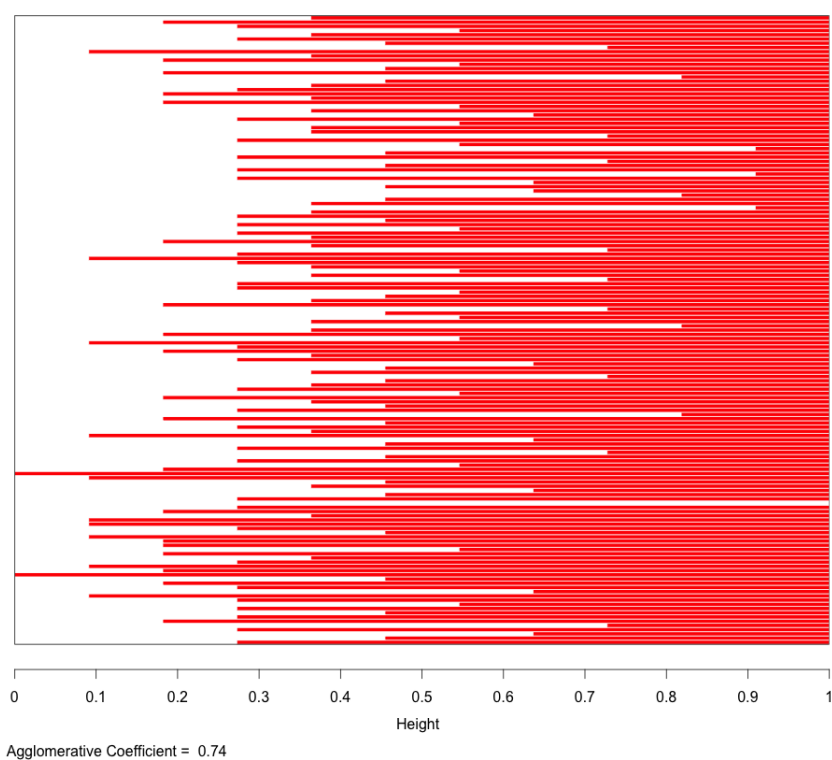


Figure 8.1: Sample Banner Agglomerative Clustering Results

because I am interested in understanding how an unsupervised analysis of patient data will reveal trends, rather than imposing them onto the data, it was particularly important to the investigation that the number of clusters be both mathematically achievable and substantively small enough for analysis while still remaining unsupervised. The general rule of thumb for cluster analysis suggested by Mardia, Kent and Bibby (1997) stipulates that the number of clusters k is approximately the square root of $n / 2$. However, in the case of our comparably small sample of urgent care visitors recorded in the NAMCS data set, such a rule would indicate at least 30 clusters—clearly not a workable number to make sense of patterns in urgent care patients and their use.

Instead, to estimate a k which would produce heterogeneous groups while still remaining theoretically enlightening, I began with non-guided hierarchal clustering of samples of 200 visits to urgent care centers randomly chosen from the data. Using the Gower methodology of finding the distance between dissimilar variable types, I calculated the distance matrix between the various observations for each sample. These distance measures were then used as the input to a hierarchal clustering algorithm which attempted to minimize the distance between observations within the same groups while maximizing the distance between them. Figure 1 shows the ‘banner’ for the initial agglomerative cluster methods for the behavioral variables, and can be understood as a graphical representation of the points at which a cluster breaks away from the pack of observations. The white lines extending to the right represent clusters at their separation point, where larger red areas between white lines indicate stronger outside group variance.

It should be noted that though the analyses were performed in two waves, the clusters should be examined with each other in mind, and I have included some of the key demographic variables in with the behavioral variables to that end. Figure above shows the typical spread of the behavioral parameters’ clusters, and is useful

for keeping the proportions of clusters in mind.

Bibliography

- ACP. 2006. "The Impending Collapse of Primary Care Medicine and Its Implications for the State of the Nation's Health Care." *Emergency Medicine* 17. Retrieved April 15, 2016 (http://www.providersedge.com/ehdocs/ehr_articles/The_Impending_Collapse_of_Primary_Care_Medicine_and_Its_Implications_for_the_State_of_the_Nation-s_Healthcare.pdf).
- Barker, Kristin K. 2008. "Electronic Support Groups, Patient-Consumers, and Medicalization: The Case of Contested Illness." *Journal of Health and Social Behavior* 49(1):20–36. Retrieved November 24, 2015 (<http://www.jstor.org/stable/27638733>).
- Becker. 2011. "10 Statistics on Urgent Care Centers." Retrieved September 21, 2015 (<http://www.beckershospitalreview.com/hospital-management-administration/10-statistics-on-urgent-care-centers.html>).
- Bloom, Samuel William. 1965. *The Doctor and His Patient*. Collier-Macmillan: Free Press ;
- Boyer, Carol A. and Karen E. Lutfey. 2010. "Examining Critical Health Policy Issues Within and Beyond the Clinical Encounter: Patient—Provider Relationships and Help-Seeking Behaviors." *Journal of Health and Social Behavior* 51:S80–93. Retrieved November 24, 2015 (<http://www.jstor.org/stable/20798318>).

- CDC, U.S. 2000–2011. “NAMCS/NHAMCS - Questionnaires, Datasets, and Related Documentation.” Retrieved March 4, 2016 (http://www.cdc.gov/nchs/ahcd/ahcd_questionnaires.htm#documentation).
- Center for Studying Health System Change. 2012. *Health Tracking Household Survey, 2010 [United States]: Version 1*. Retrieved September 15, 2015 (<http://www.icpsr.umich.edu/HMCA/studies/34141/version/1>).
- Draper, Peter and Helen L. Smits. 1975. “The Primary-Care Practitioner — Specialist or Jack-of-All-Trades.” *New England Journal of Medicine* 293(18):903–7. Retrieved November 24, 2015 (<http://www.nejm.org/doi/abs/10.1056/NEJM197510302931805>).
- Egbert, Lawrence D., George E. Battit, Claude E. Welch, and Marshall K. Bartlett. 1964. “Reduction of Postoperative Pain by Encouragement and Instruction of Patients: A Study of Doctor-Patient Rapport.” *New England Journal of Medicine* 270(16):825–27. Retrieved November 24, 2015 (<http://www.nejm.org/doi/abs/10.1056/NEJM196404162701606>).
- Freidson, Eliot. 1961. “The Sociology of Medicine.” *Current Sociology* 10(3):123–40. Retrieved April 15, 2016 (<http://csi.sagepub.com/content/10/3/123>).
- Gray, B. H. 1997. “Trust and Trustworthy Care in the Managed Care Era.” *Health Affairs* 16(1):34–49. Retrieved April 15, 2016 (<http://content.healthaffairs.org/content/16/1/34>).
- HCUP. 2014. “HCUP Fast Stats.” Retrieved September 15, 2015 (<http://www.hcup-us.ahrq.gov/faststats/StatePayerServlet?state1=0R>).
- Heritage, John and Douglas W. Maynard. 2006. “Problems and Prospects in the Study of Physician-Patient Interaction: 30 Years of Research.” *Annual Review of Sociology* 32:351–74. Retrieved November 24, 2015 (<http://www.jstor.org/>

stable/29737743).

Hibbard, Judith H. and Edward C. Weeks. 1987. "Consumerism in Health Care: Prevalence and Predictors." *Medical Care* 25(11):1019–32. Retrieved April 15, 2016 (<http://www.jstor.org/stable/3765391>).

IBISWorld. 2015. "Urgent Care Centers in the US Market Research IBISWorld." Retrieved September 16, 2015 (<http://www.ibisworld.com/industry/urgent-care-centers.html>).

Kaba, R. and P. Sooriakumaran. 2007. "The Evolution of the Doctor-Patient Relationship." *International Journal of Surgery* 5(1):57–65. Retrieved November 24, 2015 (<http://www.sciencedirect.com/science/article/pii/S1743919106000094>).

Lamont, Michèle and Virág Molnár. 2002. "The Study of Boundaries in the Social Sciences." *Annual Review of Sociology* 28:167–95. Retrieved November 24, 2015 (<http://www.jstor.org/stable/3069239>).

Laws, Margaret and Mary Kate Scott. 2008. "The Emergence Of Retail-Based Clinics In The United States: Early Observations." *Health Affairs* 27(5):1293–98. Retrieved November 24, 2015 (<http://content.healthaffairs.org/content/27/5/1293>).

Lupton, Deborah. 1997. "Consumerism, Reflexivity and the Medical Encounter." *Social Science & Medicine* 45(3):373–81. Retrieved November 24, 2015 (<http://www.sciencedirect.com/science/article/pii/S027795369600353X>).

Lupton, Deborah, Cam Donaldson, and Peter Lloyd. 1991. "Caveat Emptor or Blissful Ignorance? Patients and the Consumerist Ethos." *Social Science & Medicine* 33(5):559–68. Retrieved November 24, 2015 (<http://www.sciencedirect.com/science/article/pii/027795369190213V>).

May, Carl. 2007. "The Clinical Encounter and the Problem of Context." *Sociology*

41(1):29–45. Retrieved November 24, 2015 (<http://soc.sagepub.com/content/41/1/29>).

McKinlay, John B. and Lisa D. Marceau. 2002. “The End of the Golden Age of Doctoring.” *International Journal of Health Services* 32(2):379–416. Retrieved April 15, 2016 (<http://joh.sagepub.com/content/32/2/379>).

Mechanic, David. 1966. “The Sociology of Medicine: Viewpoints and Perspectives.” *Journal of Health and Human Behavior* 7(4):237. Retrieved November 24, 2015 (<http://www.jstor.org/stable/2948770?origin=crossref>).

Mehrotra, Ateev, Margaret C. Wang, Judith R. Lave, John L. Adams, and Elizabeth A. McGlynn. 2008. “Retail Clinics, Primary Care Physicians, And Emergency Departments: A Comparison Of Patients’ Visits.” *Health Affairs* 27(5):1272–82. Retrieved September 21, 2015 (<http://content.healthaffairs.org/content/27/5/1272>).

Miller, William L., Benjamin F. Crabtree, Paul A. Nutting, Kurt C. Stange, and Carlos Roberto Jaén. 2010. “Primary Care Practice Development: A Relationship-Centered Approach.” *The Annals of Family Medicine* 8(Suppl 1):S68–79. Retrieved November 24, 2015 (http://www.annfammed.org/content/8/Suppl_1/S68).

O’Malley, Ann S. 2013. “After-Hours Access To Primary Care Practices Linked With Lower Emergency Department Use And Less Unmet Medical Need.” *Health Affairs* 32(1):175–83. Retrieved September 15, 2015 (<http://content.healthaffairs.org/content/32/1/175>).

Petersen, L. A., H. R. Burstin, A. C. O’Neil, E. J. Orav, and T. A. Brennan. 1998. “Nonurgent Emergency Department Visits - The Effect of Having a Regular Doctor.” *Medical Care* 36(8):1249–55.

Phillips, Robert L. and Andrew W. Bazemore. 2010. “Primary Care And Why It

-
- Matters For U.S. Health System Reform.” *Health Affairs* 29(5):806–10. Retrieved November 24, 2015 (<http://content.healthaffairs.org/content/29/5/806>).
- Pitts, Stephen R., Emily R. Carrier, Eugene C. Rich, and Arthur L. Kellermann. 2010. “Where Americans Get Acute Care: Increasingly, It’s Not At Their Doctor’s Office.” *Health Affairs* 29(9):1620–29. Retrieved September 21, 2015 (<http://content.healthaffairs.org/content/29/9/1620>).
- Potter, Sharyn J. and John B. McKinlay. 2005. “From a Relationship to Encounter: An Examination of Longitudinal and Lateral Dimensions in the Doctor-Patient Relationship.” *Social Science & Medicine* (1982) 61(2):465–79.
- Reeder, Leo G. 1972. “The Patient-Client as a Consumer: Some Observations on the Changing Professional-Client Relationship.” *Journal of Health and Social Behavior* 13(4):406–12. Retrieved November 24, 2015 (<http://www.jstor.org/stable/2136833>).
- Reich, Adam D. 2014. “Contradictions in the Commodification of Hospital Care.” *American Journal of Sociology* 119(6):1576–1628. Retrieved November 24, 2015 (<http://www.jstor.org/stable/10.1086/676836>).
- Rubin, Mike. 2012. “Urgent Care.” *EMS World* 41(4):70. Retrieved September 21, 2015 (<http://search.proquest.com/docview/1007867084/abstract?>).
- Shaw, Eric K. et al. 2013. “Decision-Making Processes of Patients Who Use the Emergency Department for Primary Care Needs.” *Journal of Health Care for the Poor and Underserved* 24(3):1288–1305. Retrieved September 21, 2015 (https://muse.jhu.edu/journals/journal_of_health_care_for_the_poor_and_underserved/v024/24.3.shaw.html).
- Shortliffe, Ernest C., T. Stewart Hamilton, and Edward H. Noroian. 1958. “The Emergency Room and the Changing Pattern of Medical Care.” *New England*

- Journal of Medicine* 258(1):20–25. Retrieved September 15, 2015 (<http://dx.doi.org/10.1056/NEJM195801022580105>).
- Southerton, Dale. 2002. “Boundaries of ‘Us’ and ‘Them’: Class, Mobility and Identification in a New Town.” *Sociology* 36(1):171–93. Retrieved November 24, 2015 (<http://soc.sagepub.com/content/36/1/171>).
- Starr, Paul. 1982. *The Social Transformation of American Medicine*. Basic Books.
- Stratmann, William C. and Ralph Ullman. 1975. “A Study of Consumer Attitudes About Health Care: The Role of the Emergency Room on JSTOR.” Retrieved September 21, 2015 (<http://www.jstor.org/stable/3763675>).
- Timmermans, Stefan and Hyeyoung Oh. 2010. “The Continued Social Transformation of the Medical Profession.” *Journal of Health and Social Behavior* 51:S94–S106. Retrieved November 24, 2015 (<http://www.jstor.org/stable/20798319>).
- Ullman, Ralph, James Block, and William C. Stratmann. 2015. “An Emergency Room’s Patients: Their Characteristics and Utilization of Hospital Services on JSTOR.” Retrieved September 21, 2015 (<http://www.jstor.org/stable/3763673>).
- Wang, Margaret C., Gery Ryan, Elizabeth A. McGlynn, and Ateev Mehrotra. 2010. “Why Do Patients Seek Care at Retail Clinics, and What Alternatives Did They Consider?” *American Journal of Medical Quality* 25(2):128–34. Retrieved September 21, 2015 (<http://ajm.sagepub.com/content/25/2/128>).
- Weinick, Rachel M; Mehrotra, Robin M; Burns. 2010. “Many Emergency Department Visits Could Be Managed At Urgent Care Centers And Retail Clinics - ProQuest.” *Health Affairs*. Retrieved September 21, 2015 (<http://search.proquest.com/docview/755047690/TextGraphic/1?accountid=13475>).
- Weinick, Robin M. and Renée M. Betancourt. 2015. “No Appointment Needed: The

Resurgence of Urgent Care Centers in the United States.”

Weinick, Robin M., Steffanie J. Bristol, and Catherine M. DesRoches. 2009. “Urgent Care Centers in the U.S.: Findings from a National Survey.” *BMC Health Services Research* 9:79. Retrieved September 21, 2015 (<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2685126/>).

Weinick, Robin M., Steffanie J. Bristol, and Catherine M. DesRoches. 2009. “Urgent Care Centers in the U.S.: Findings from a National Survey.” *BMC Health Services Research* 9(1):79. Retrieved November 24, 2015 (<http://www.biomedcentral.com/1472-6963/9/79/abstract>).

Wright, Eric R. and Brea L. Perry. 2010. “Medical Sociology and Health Services Research: Past Accomplishments and Future Policy Challenges.” *Journal of Health and Social Behavior* 51:S107–19. Retrieved November 24, 2015 (<http://www.jstor.org/stable/20798320>).

Yee, Tracy, Amanda Lechner, and Ellyn Boukus. 2013. “The Surge in Urgent Care Centers: Emergency Department Alternative or Costly Convenience?” Retrieved November 24, 2015 (<http://www.hschange.com/CONTENT/1366/>).