The Greater Augusta Healthcare Network (GAHN): An Impact Evaluation

A Dissertation submitted
to the Graduate School
Valdosta State University

in partial fulfillment of requirements
for the degree of

DOCTOR OF PUBLIC ADMINISTRATION

in Public Administration

in the Department of Political Science
of the College of Arts and Sciences

December 2012

Kimberly F. Gray

MPA, Augusta State University, 2000
BA, Capital University, 1990

This dissertation, "The Greater Augusta Healthcare Network (GAHN): An Impact Evaluation," by Kimberly F. Gray, is approved by:

Dissertation Committee Chair

_____

Viviane E. Foyou, Ph.D.
Assistant Professor of Political Science

Committee Member

_____

James W. Peterson, Ph.D.
Professor of Political Science

Committee Member

_____

Saundra J. Reinke, D.P.A.
Professor of Public Administration
Augusta State University

Dean of the College of Arts and Sciences

_____

Connie L. Richards, Ph.D.
Professor of English

Dean of the Graduate School

_____

Alfred F. Fuciarelli, Ph.D.
Professor of Chemistry

FAIR USE

DUPLICATION

I authorize the Head of Interlibrary Loan or the Head of Archives at the Odum Library at Valdosta State University to arrange for duplication of this dissertation for educational or scholarly purposes when so requested by a library user. The duplication shall be at the user's expense.

Signature _____

I refuse permission for this dissertation to be duplicated in whole or in part.

Signature _____

ABSTRACT

This study estimates the impact that the Greater Augusta Healthcare Network (GAHN) has had on inappropriate emergency department visits by uninsured patients. The research question considered whether or not the community health clinics decrease inappropriate emergency department visits by uninsured patients. The study compared the total number of uninsured, inappropriate emergency department visits to the total number of community health clinic (CHC) visits that could occur if visits at the CHCs met capacity to determine financial impact. Analysis of four years of data of uninsured patient visits to three hospital emergency departments and to five area CHCs showed that area clinics do not decrease inappropriate emergency department visits by uninsured patients, but that the clinics do provide an important healthcare home for uninsured patients. GAHN could have a greater impact on the community by using case management, by implementing a physician registry, and by using a geographic information system (GIS) to improve their service delivery.

TABLE OF CONTENTS

LIST OF TABLES

ACKNOWLEDGEMENTS

To Dr. Viviane Foyou, I sincerely appreciate her time serving as Chairperson of my committee, especially not knowing a lot about me before agreeing. I thank her for taking the chance.

To Dr. James Peterson, I owe great gratitude for his constant communication with me; answering my many e-mails and concerns about the classes, requirements, forms, etc. His hard work and attention to detail certainly helped me and many other students going through the program.

To Dr. Saundra Reinke, I thank her for serving on my committee, especially since she was not a part of the VSU faculty, but she took the extra steps required to participate and provide me leadership and support through the process.

To Dr. Cathy Slade, I thank her for identifying such a relevant topic for my paper and then providing me with the professional guidance along the way. I appreciate her reviews and edits of my drafts, to make sure that I wasn't too far off base. Her vast knowledge of health policy kept me focused through to the end. Thank you.

To my friends and colleagues in the Department of Political Science at Augusta State University, Dr. Martha Ginn, Dr. Kathleen Searles, Dr. Sudha Ratan, thank you for pushing me to finish. The constant questioning and prodding me along definitely helped. I appreciate you taking time to sit on the mock defense and for the Thursday evening follow-ups. Of course, Laura Nichols, I thank her too.

To Dr. Jerry Merwin, he was an absolute positive force in ensuring we learned in our classes. He led us and encouraged us. I enjoyed learning from him.

To Dr. Nolan Argyle, I thank him for his advising and leading this program over the years, and for finally admitting me to the program.

To Dr. Deborah Natvig for her support and coordination with the GAHN Board in securing the data, as well as Nita Sakievich her patience and support in providing the data for the study. Thanks also goes to the GAHN Board for approving the study.

A special thanks to my classmates in my cohort who all worked as a team to ensure we all made it through the program. Many of us have; Dustin, Penelope, Leah, Leigh, Wendy, and John. Hopefully we can encourage the last few through.

A super special thanks to Shelly, who came into my life during the last year of this educational journey, but still encouraged me and supported me through to the end. It was as important to her because it was important to me.

DEDICATION

To my loving parents, who define unconditional love and trust. They have supported me through everything I have ever done. They are absolutely the best parents anyone could ever ask for, though, I didn't even have to ask.

Chapter I

INTRODUCTION

With initial funding from the Healthcare Georgia Foundation, the Georgia Health Sciences University (GHSU) College of Nursing spearheaded the Greater Augusta Healthcare Network (GAHN) initiative in collaboration with key community healthcare stakeholders with the goal of creating a seamless healthcare system to increase access to quality healthcare services for area citizens. According to the organization's Web site http://www.georgiahealth.edu/nursing/gahn/, GAHN is a network of organizations whose members include six hospitals, seven community clinics, the East Central Health District, and five community service providers whose mission is to improve the health of, and reduce the burden of, illness in the greater Augusta community by increasing access to quality, cost-effective health care for medically under-served residents.

Augusta, Georgia, is located in east-central Georgia, on the western border of South Carolina. Augusta is the county seat of Richmond County, a consolidated government, which has a population of 201,217 (United States (U.S.) Census Bureau, 2010). To put the area in perspective, the following table shows two other areas in the state of Georgia of comparable size.

Table 1: Georgia County Comparison

	County Population	County Poverty Level (%)	Primary City	City Population	City Poverty Level (%)
Chatham County	271,544	16.60	Savannah	139,491	23.80
Richmond County	201,217	23.30	Augusta	196,494	23.70
Muscogee County	194,107	18.20	Columbus	194,107	18.20

Source: U.S. Census Bureau, Quick Facts (2011)

Organization Mission

A basic element of definition of an organization is that "organizations are goal-oriented, purposive entities" (Rainey, 1997, 125). Public organizations normally issue mission statements or expressions of their major goals and values. These official goals are formal expressions of general goals that express an organization's major values and purpose. Goals are normally stated in the mission statement to enhance the organization's legitimacy and motivate and guide its members. Therefore, an organization's goals and organizational performance and effectiveness are related (Rainey, 1997).

The mission of the GAHN, as stated above, is "to improve the health of and reduce the burden of illness in the greater Augusta community by increasing access to quality, cost-effective health care for medically under-served residents." (1) The GAHN Web site also reveals an additional mission of the organization, which states:

> to bring together a core group of committed community stakeholders, who will recruit area health care and social service providers, forming the Greater Augusta Healthcare Network (GAHN). Through shared expertise and resources, a seamless system of health care will be created to provide a health care home for all area residents. (1)

As can be seen, the mission of the organization is incredibly unclear and like many public organizations, GAHN has "vague, multiple, relatively intangible goals" (Rainey, 1997, 128). If we include the vision, the vision is "to improve the health and

reduce the burden of illness in the greater Augusta community by increasing access to quality, cost effective health care for medically under-served residents." (1) These missions and vision represent the goals of the organization. It is important to be acquainted with these goals as the evaluation seeks to determine if GAHN is reaching its goals. Immediately, one would wonder if the goals of this organization are possible to evaluate. To ensure an effective and efficient organization, the goals should be clear and evaluable.

Background

GAHN does not directly employ anyone. There are some administrative employees who collect data, manipulate data, report data, superficially analyze data, and schedule and attend meetings of the membership. These employees are not working directly towards the goals of the organization, but support the network of organizations. As this study expands and evaluates the selected research questions, we hope to be able to determine if the organization is meeting its mission initially stated above, "to improve the health of and reduce the burden of illness in the greater Augusta community by increasing access to quality, cost effective health care for medically under-served residents." (1) This study will make an effort to determine if GAHN is accomplishing this mission as the study focuses on the uninsured patient's access to healthcare.

Hospital emergency departments are treating more people than ever; especially those who are being treated for non-urgent care issues. These non-urgent care issues could potentially be just as well be treated in a non-urgent care setting, such as a community health clinic (CHC). To determine the validity of that statement, this study focuses on analyzing whether enrollment in a community health clinic affects how

uninsured adults utilize hospital emergency departments. This retrospective analysis is based on de-identified data already collected by area hospital emergency departments (ED) and CHCs, which are part of the GAHN. The results of this study will provide insight into the value of CHCs for uninsured and underinsured patients in the Augusta area.

Overutilization of the ED for non-urgent care is often attributed to the lack of a medical home or primary care physician. This is especially true for the uninsured or under-insured patient for which medical care access is especially problematic. If uninsured patients are provided a medical care home or primary care physician, their ED usage for non-urgent care will decrease, thus saving money for hospitals and in turn, saving money for taxpayers.

Research shows also shows that emergency department visits for non-urgent care costs at least two to three times that of comparable care in clinics or non-urgent care settings (MacDonald-Thompson and Glick, 1999). With ED usage increasing annually especially for non-urgent care, the associated health care costs are increasing significantly.

In this study, I will analyze the number of uninsured patient visits to Augusta area hospital EDs to determine if enrolling these patients in local area CHCs, which are part of the GAHN, can lead to a decrease in the utilization of the ED for non-emergent care visits. These non-emergent care visits could be handled more effectively in a primary care setting, like a CHC. Analysis will begin by determining the volume of non-urgent care patient visits to three area hospital EDs. The three EDs included in the study are the GHSU Medical Center, Trinity Hospital, and University Hospital. The nature of these

non-emergent visits is identified in the datasets by the emergency Evaluation and Management (E&M) codes. E&M coding is the process which physician-patient translates encounters into five digit current procedural terminology (CPT) codes to facilitate billing. CPT codes are submitted to insurers for payment and every billable procedure has its own individual CPT code (EM University, 2012).

The CPT codes which describe physician-patient encounters are often referred to as "E&M codes" There are different E&M codes for different types of encounters such as office visits or hospital visits (E/M University, 2012). Within each type of encounter, there are different levels of care. These codes are based on the nature of the presenting problem and not the final diagnosis (Brault, 2008) and define the overall complexity of a patient encounter, without consideration to the amount of time spent with the patient. These E&M codes are used in EDs to identify the level of emergency decision-making that an emergency room physician must use in determining the severity of the presenting problem.

There are five E&M codes, but this study focuses on Level 1 and Level 2, non-emergent cases that could be handled effectively in a non-urgent care setting. GAHN, the organization that compiled the data, only collected Level 1 and Level 2 visit data since the focus of the organization is to improve access and the continuum of care, thereby reducing inappropriate ED usage. The ED visit data will then be associated with a cost equivalent based on the type of patient presenting to the ED, which in this study is the uninsured patient. This ED cost will be estimated by using industry averages, since actual costs are not included in the secondary data set. Augusta area CHC visits will also be

analyzed and compared to determine the volume and associated costs of uninsured patients presenting at those clinics for comparable medical issues.

De-identified patient data will be used in this study to determine relationships between inappropriate ED use and clinic visits, but without patient identifiers, causality cannot be determined. GAHN has collected the visit data over the years as it has because of the Health Insurance Portability and Accountability Act (HIPAA) Privacy Rule. The Privacy Rule does not directly regulate research, but it limits the ability of healthcare providers and other institutions to use or disclose health information for research (Gunn et al., 204). HIPAA was intended to address potential threats to patient privacy in the environment of computerization and standardization of medial records, but the broad purpose of the regulation is to protect certain types of individually identifiable health information, known as protected health information, from unauthorized access, use, or disclosure (Kamoie and Hodge, 2004). The statute was also intended to ensure the portability of health insurance (Gunn, 2004). The Department of Health and Human Services (DHHS) published the final modifications to the Privacy Rule on August 14, 2002 (Gunn, 2004) and the rule became effective on April 14, 2003 (Kamoie and Hodge, 2004).

The Privacy Rule treats de-identified health information differently than protected health information, which is health information that is individually identified. De-identified health information does not require authorization of the patient for use and release of the information (Gunn, 2004). The strict penalties and complications of the Privacy Rule made it clear that GAHN should use de-identified data in order to collect information about the uninsured patient and ED use. Research has shown that requiring

advance permission reduced participation rates in research, especially when that permission was required in writing (Nelson et al., 2002). When researchers were required to contact potential participants for written consent before medical record review, only 19% of those contacted authorized the use of their medical records (Nelson et al, 2002). With statistics like these, it is no wonder than GAHN chose to use de-identified data.

Even when the use or disclosure of personal health information is permitted, entities may generally provide only the "minimum necessary" amount of information to accomplish the intended purpose of the use, disclosure, or request (Kamoie and Hodge, 2004). In essence, had GAHN been one of the disclosure exceptions to the requirements for individual authorization, the needed information would not have been included. It would have been difficult for GAHN to track patients with only a patient age, birth date and zip code for ED visits and comparable CHC visits. According to the HIPAA Privacy Rule, some identifiers can be retained, while names and addresses must be removed (Gunn, 2004). For these reasons, GAHN received de-identified data from the hospitals and the clinics, but has used the de-identified data in the best way possible to help reach its mission.

Research Questions

The study focuses on two research questions. The primary research question is that as the volume of new uninsured patients increases at the clinics, the volume of uninsured patient visits for non-emergent ED visits decreases. The alternate research question is that if there is an inverse relationship between ED visits and CHC visits, the cost savings for the area hospitals will exceed the growth in uncompensated care provided by the clinics.

The research will be conducted using the GAHN data set. GAHN clinic and hospital members collected and contributed data for 2007 through 2010. The purpose of the data, according to GAHN, is to assist GAHN and its members in the development and execution of methods to redirect patients seeking primary care services away form the ED and into CHCs more appropriate to their needs. This study will analyze whether or not the data shows that this redirection is actually taking place.

The GAHN dataset includes four years of de-indentified ED visit data, such as the number of local area ED visits, the number of non-emergent ED visits, and payer types for each visit. The CHC visit data includes comparable visit data to the hospital ED visit data, such as the number of visits, associated diagnosis for each visit, and the payer type for each visit. All data sets are stratified by zip code and demographics, but those variables won't be central to this particular study but will be important to the final discussion.

By better understanding non-emergent ED usage for uninsured patients and comparing the growth of uncompensated care at the Augusta area CHCs, we can quantify the cost savings of uninsured patients finding a medical home or primary care physician. The findings will inform local area hospitals of the importance of CHCs and their place in the continuum of care. As the GAHN CHCs continue to be partially funded by the local area hospitals in this study, the results can help GAHN members better coordinate financial resources to best serve the community.

History

According to the U.S. Census Bureau (2011), 27.4 percent of adults 18 years of age and older are uninsured. Medical costs in the U.S. are extremely high and rising, so

people without health insurance may not be able to afford medical treatment or prescription drugs. Individuals without health insurance are also less likely to get routine checkups and screenings, so if they do become ill they will not seek treatment until the condition is more advanced and therefore more difficult and costly to treat (Ayanian et al., 2000). Delaying the need for appropriate intervention until the need is so urgent, increased the likelihood the uninsured patient will go to the ED to stabilize his condition, only to be referred to a primary care physician. However, these referrals are difficult for uninsured patients who normally do not have a primary care physician. Stabilization at the ED then takes place until the patient's next visit to the ED. Many uninsured people end up going to the ED at a hospital for their health care since the ED must treat all people who present to the ED, regardless of insurance status.

In 1986, the U.S. Congress passed the Emergency Medical Transport and Labor Act (EMTALA). The law requires that a hospital, which participates in Medicare, screen anyone seeking emergency care. If the screening reveals an emergent medical condition, the hospital is required to perform stabilizing treatment (Lee, 2000). EMTALA was intended to ensure patient access to emergency medical care and to prevent the practice of "patient dumping." "Patient dumping" occurs when a hospital refuses to provide emergency care to an uninsured patient and transfers the patient to another facility, usually a public hospital (Weiss and Martinez, 1999). Uninsured patients were often transferred to other hospitals solely for financial reasons without consideration of their medical condition. Studies performed near the time of EMTALA's enactment estimated the extent of the "patient dumping" problem. One study revealed that 87% of ED transfers to a public hospital happened because of the lack of insurance (Weiss and

Martinez, 1999). This law is one of the most comprehensive laws guaranteeing non-discriminatory access to emergency medical care (Zibulewsky, 2001).

EMTALA imposes three distinct legal duties on hospitals. The most important part is that hospitals must perform an "appropriate screening examination" on any person who comes to the hospital and requests care to determine whether an emergency medical condition exists. This is defined as "acute severe symptoms that could reasonably be expected to result in complications without medical attention" (Weiss and Martinez, 1999, 336). If an emergency medical condition exists, hospital staff must either stabilize that condition to the extent of their ability or transfer the patient to another hospital with the appropriate capabilities. Specialty hospitals are required to accept transfers of patients in need of such specialized services if they have the capacity to treat them (Zibulewsky, 2001). Once the patient's condition stabilizes, the hospital has no other duties to the patient under EMTALA (Weiss and Martinez, 1999).

The relevance of this law to the nature of this study is important. EDs are open 24 hours a day, seven days a week and any patient can be seen at any time without regard to the ability to pay or the severity of the problem. Federal law states that people who present themselves to the emergency room must be seen to determine their medical condition regardless of their ability to pay. As such, EDs are an important part of the nation's health care safety net. In 2007, nearly two-thirds of EDs were classified as safety net hospitals, which is nearly double the number of EDs classified as such in 1997 (Gore, 2010). Safety net hospitals take on a substantial responsibility in serving uninsured patients, Medicaid enrollees, and vulnerable populations facing a variety of barriers to healthcare access. These hospitals serve large numbers of racial and ethnic minorities,

and serve people in remote rural areas who have few other alternatives for care (Meyer, 2004). As a result, ED overutilization has become a large problem in healthcare.

In addition, the public hospital in Augusta, the Georgia Health Sciences Medical Center (GHSMC), is not only considered a safety net hospital, but is also designated as a Level I regional trauma center. The Level I trauma center in Augusta is one of only five Level I trauma centers designated in the state of Georgia. The state funds the trauma centers through a state appropriation for uncompensated care, but the high cost of trauma readiness and treatment costs are much greater than the state can fund. As a result in the limited amount of funding, some trauma centers have considered dropping their designation (Ashley, 2010). The high cost of uncompensated care in trauma care cannot be met by the state and a referendum of voters in 2011 to add a $10 fee to license plates for trauma funding did not pass. State policy on funding trauma centers is just another dilemma facing hospitals as it relates to the issue of uninsured patients presenting to the ED. Of course, keeping inappropriate visits out of the ED could only help.

A community health clinic is an alternative to the ED, especially for the uninsured patient. CHCs help overcome barriers to care because they are located in high-need areas, are open to all residents, offer services that facilitate access to care such as outreach and transportation, and tailor their services to their communities' unique cultural and health needs. Through high quality, cost effective care, CHCs reduce health disparities, effectively manage chronic diseases, and stimulate economic growth (Choudhry et al., 2007).

Chapter II

LITERATURE REVIEW

Overutilization of the ED in hospitals all over the country is increasing every year. In the ten-year period from 1997 to 2007, U.S. ED per capita use increased 11%. Even more alarming, in 2007 approximately 8%, of the 11%, were classified as non-urgent (U.S. Government Accounting Office, 2011).

Because of the high number of ED visits and the high cost of those visits, there have been numerous investigations into the causes of high ED usage, how to alleviate that high usage, and how to divert usage that may be inappropriate. Many people believe that overcrowded EDs are a result of uninsured patients visits to the ED for inappropriate reasons. Although the uninsured are presenting to the ED in high numbers, so are insured patients (Newton et al., 2008).

Most primary care physicians and CHCs are not normally open during evening and weekend hours, even though they may extend their hours to attend to more patients. On the other hand, ED visits are made during the day, at night, and on weekends by all types of patients with various illnesses and injuries. Patients visit the ED with varying sources of payment or no ability to pay at all. In addition, not all ED visits are necessary; some visits may be handled in less costly settings or even avoided altogether through better management of chronic conditions, usually through a primary care physician

(Choudhry et al., 2007). Emergency room hours contribute to the high use of the ED, but the lack of awareness of other sources of care, lack of access to primary care and other providers, and financial barriers also contribute to ED use, especially for non-urgent conditions.

CHCs, which are required to serve patients regardless of their ability to pay, are an important safety net provider for financially or otherwise vulnerable populations (U.S. GAO, 2011). Although use of the ED for non-urgent and preventable conditions appears to be common and growing, identification of these conditions remains imprecise (DeLia and Cantor, 2009).

There are many assumptions that appear throughout the literature, but when compared with the best available evidence, these assumptions can be proven inconclusive or even false. One assumption is that uninsured patients are crowding the ED with non-emergency issues. The truth is that uninsured patients are no more likely to make a non-urgent visit than those with private insurance (Newton et al., 2008). It should be noted that The National Hospital Ambulatory Medical Care Survey found that ED visits classified as non-urgent increased from 4% to 14% from 1997 to 2005 and increased 5.7% to 16.7% for uninsured patients (Newton et al, 2008). ED visits are increasing for all populations, not just for the uninsured patient population.

Use of the ED for non-urgent care is often associated with limited access to primary care providers. Usually the reason is financial, but could be for logistical or other reasons. ED use for non-urgent and preventable conditions is most common among Medicaid patients, uninsured individuals, children under age 5, and patients visiting public hospitals. In addition, some patients prefer the ED due to convenience, the access it

provides to specialty care, or perceptions that higher-quality care is available in a hospital setting (DeLia and Cantor, 2009).

The ED is an expensive and inefficient place to receive most non-urgent care (Newton et al., 2008). EDs must perform more extensive diagnostic evaluations than would a primary care physician who understands the health history of a patient. An ED visit starts right from the beginning, or with nothing having been done previously, for each patient on each visit, which is an inefficient practice that requires unnecessary charges. Uninsured patients present to the ED at a rate that is approximately the same number of times per year as do insured patients; however uninsured patients use the ED more frequently overall than insured patients. Even if uninsured patients do not contribute to ED crowding, they are going to the ED quite frequently primarily because of their lack of access to primary care (Newton et al., 2008).

To find out where, when, and why Americans seek treatment for acute care, analysis of three different national surveys of randomly sampled office visits, outpatient department subsamples and ED subsamples was undertaken (Pitts et al., 2010). Pitts and others used three data sets of probability samples that covered a four-year period, focusing on the "initial visit" of each patient. By examining people of all ages with all different levels and types of health care coverage or insurance, researchers could better understand where people go for their acute care visits. They found that 42% of first visits are made to patients' primary physicians while 28% of first visits were to the ED. There was a disproportionate share of uninsured patients handled in EDs compared to other healthcare sites (Pitts et al., 2010). Access to primary care is a definite concern.

The heavy use of the ED for problems that can be treated by a primary care

provider is undesirable and not cost-effective. In addition, the ED does not consider the patients' ongoing health care as would a primary care physician. This lack of access to primary care ends up being costly, ineffective and inefficient, but the uninsured patient's lack of accessible primary care, is precisely the reason why they go to the ED in the first place. However, uninsured patients are not presenting to the ED more often than insured patients; everyone is presenting more to the ED. Therefore, uninsured patients are not the leading cause of ED crowding (Newton et al., 2008).

One dimension of ED overutilization is the people who visit the ED partially or primarily for non-medical reasons. These include people with economic or social problems whose reliance on EDs may be based on factors other than their immediate need or desire for medical care. These factors are often complex, chronic, and complex psychological, social, and economic problems, which are not captured by most studies. Most studies are based on ED visits and the medical reasons for such visits (Malone, 1998). However, there are many different reasons underlying why so many people go to the ED for medical care.

The reasons why people visit the ED are various. The history of EDs reaches back to almshouses where people with no family would go for general care and companionship. Since they didn't have anyone to take care of them at home, they would go to the almshouse for care. Almshouses began treating emergency issues. As the ED developed into what we understand it to be today, people still went to the ED for those basic, non-emergency events such as colds, aches, pains, and headaches. Nurses used to have the time to care for these concerns and would care for them and provide companionship to those patients, all between emergencies. As EDs became more

crowded, emergency cases became more traumatic and treatment became more costly. As a result, nurses were no longer able to give patients specialized and personal care (Malone, 1998). Today, the needy continue to use the ED for basic care and for what is now considered as inappropriate ED usage.

Inappropriate Use

Defining "inappropriate" use varies. In a study by Eherlich et al., they used four categories to define the ED visit acuity level: Level 1 = resuscitation, Level 2 = emergency, Level 3 = urgent, and Level 4 = non-emergency. Ehrlich's study of 200 random ED clients revealed that 50% of the sample ED events were at the non-emergency level or Level 4. Eighty-nine percent of the cases, Level 4 and Level 3 combined, could have been handled at a non-ED treatment center (Eherlich et al., 2004).

Researchers from the New York University (NYU) Center for Health and Public Service Research and the United Hospital Fund of New York developed an ED use profiling algorithm to aid in analysis of ED records (Billings, Parikh, and Mianovich, 2000). The algorithm classifies ED use into four categories:

- Non-emergent
- Emergent/primary care treatable
- Emergent/ED care needed, but preventable/avoidable
- Emergent/ED care needed, not preventable/avoidable

This algorithm is based on information extracted from a sample of complete ED records and was developed with the advice of a panel of ED physicians (Billings et al., 2000). This algorithm was used in at least two other studies (Rust et al., 2009) and (Weinick et al., 2010).

Another method of defining ED acuity levels is by using the physician recorded CPT codes. These E&M codes are appropriate for the majority of patients. These codes represent a choice of the billed service level and are based on the medical decision-making or nature of presenting problem, not the final diagnosis (Brault, 2008). Physicians use these E&M codes in patient records to document the presenting problem for billing purposes. Proper coding determines the correct billing rate, so physicians try to be as accurate as possible. Lower levels of medical decision making relate to lower levels of seriousness which, in turn, correlates with less serious medical emergencies (Brault, 2008). Documentation requirements also vary among different billing companies and payers (Brault, 2008), so these codes could vary between hospitals, within hospitals, or even between patients. Less serious medical emergencies documented by the lower codes would be considered "inappropriate."

Research shows a strong interest in ED overcrowding, and the reasons for the overcrowding. Questions remain as to why uninsured patients frequent EDs at greater rates than insured patients and at higher levels of inappropriateness. The result illustrates that the biggest issue for inappropriate ED visits is the lack of access to primary care. Insured patients are using the ED at approximately the same rate as uninsured patients, but the hospitals cannot afford to continue to operate in this manner. A primary care physician visit costs less than an ED visit, so the question normally posed is how do uninsured patients get access to primary care?

Access

There are different ways to address the access issue, but there are no easy answers. Some hospitals and EDs are creating programs attempting to help patients establish a

medical care home that will provide preventative and primary care (Felland, Hurley, and Kemper, 2008). Popular medical care homes for the uninsured include CHCs. ED personnel can redirect non-urgent patients to a CHC by facilitating and encouraging them to use CHCs. EDs that have instituted programs to redirect patients have found that targeting patients who frequently visit the ED and referring them to a primary care setting will reduce their dependence on the ED (Felland et al., 2008).

CHCs have also implemented strategies to help reduce ED use. These strategies focus on ED diversion, care coordination, and accessibility of services. Care coordination involves CHCs collaborating with hospitals to divert ED patients. The CHCs inform ED patients on the appropriate use of the ED and the services offered at nearby CHCs. CHCs may reduce ED visits by instituting care coordination. By encouraging patients to first seek care at a CHC can reduce or even prevent disease-related emergencies from occurring. Health centers also use other strategies to increase the accessibility of their services, such as offering evening and weekend hours or providing same-day and walk-in appointments, which make the CHC a convenient and viable alternative to the ED (U.S. GAO, 2011).

The presence of CHCs, which provide the needed health care access mission to the poor and uninsured individuals, help to alleviate over-crowded EDs. The availability of CHCs is associated with lower rates of hospital ED use, particularly among the uninsured patients (Rust et al., 2009). In the examination of emergency department use in 117 rural counties in Georgia, over three years from 2005 to 2008, the presence of CHCs resulted in fewer ED visits. Since this study took place in rural counties, the areas were also less likely to have more than one ED or other safety net health care provider, which

made for fewer variables (Rust et al., 2009). When comparing ED use in rural counties in Georgia, the incidence of ED use was lower in the counties where there was a CHC present than it was in the counties where there was no CHC present.

Although CHCs do help to reduce ED visits in rural counties, non-rural areas cannot be assessed in the same manner. Records of patients enrolled in physician access programs were examined by Zahradnik (2008) to discover if their ED use patterns changed after enrollment. This study analyzed the records of more than 40,000 uninsured adults' ED visits to one hospital and compared those records to the enrollment records of a county physician provision program that provided access to free or low-cost primary care for uninsured, low-income adults. The significance of the physician provision program could be determined because of the timing of the project. ED data was collected for one year prior to program implementation, three years during the program, and for one year after the termination of the program.

A sample of enrolled patients who visited the ED was compared to the control group of non-enrolled patients who visited the ED. The strength of this study was in the identified patient data, which was studied over a five-year time frame. Most other studies did not include patient-identified data and normally covered shorter time frames. This study also delivered results on two levels. One level was in the comparison of the before-during-after relationships and the second level was in the comparison of the enrollee v. non-enrollee control method. These two methods, plus the fact that the data did not rely on patient recall, added to the validity of the study (Zahradnik, 2008).

A unique attribute of this study developed by Zahradnik (2008) was also the Intensity of Use Indicator (IUI). This indicator provided

> a means of summarizing each patient's use of hospital resources in a manner that goes beyond how many times they visited the ED or how much each of those visits cost. The formula for calculating IUIs for patients combines the most relevant dimensions of each patient's resource use into a single number (Zahradnik, 2008, 251).

This study was based on patient costs and tracked patients well beyond the ED, so it included costs for patients who were admitted to the hospital after being treated in the ED. Although this provided a more comprehensive study into each patient's total visit, the study showed a broader picture that went beyond the ED visit.

For instance, a patient who made multiple visits to the ED, but was never admitted to the hospital would have a lower IUI than a person who was treated at the ED and admitted to the hospital just once. According to Zahradnik's methodology, the first person with the lower IUI used fewer hospital resources than the person who was admitted. The issue here is that the admitted person's health issue could assumably be more serious, so the visit to the ED seems appropriate. The person going to the ED more often could be for less appropriate reasons.

Zahradnik (2008) revealed that giving adults access to primary care alternatives affected the way they used a hospital emergency department. Because this study examined human behavior, Zahradnik believed a longer time frame would provide more answers.

Weinick et al. (2010) considered alternatives to the ED by investigating the relationship of ED visits to similar visits to urgent care centers and retail clinics. Urgent care centers and retail clinics are normal health care alternatives for non-emergency care. Just less than 30% of people live within a ten-minute drive of a retail clinic, although retail clinics are not normally located in low-income or minority neighborhoods (Weinick

et al., 2010), which is where the uninsured individuals normally reside. Retail clinics, urgent care centers, and EDs all provide walk-in care for acute conditions or chronic conditions, although EDs are always open and serve everyone regardless of their ability to pay.

Weinick et al. (2010) studied eight retail clinics and 35 urgent care clinics across several states over the period of less than a year. Similar data for ED visits was extracted from the National Hospital Ambulatory Medical Care Survey (NHAMCS). ED visits that included subsequent hospital stays were excluded. Weinick et al. stated that "for patients who were subsequently admitted to the hospital as being de facto inappropriate for care at a retail clinic or urgent care center (1631)." The data from 31,197 total visits of de-identified data remained for analysis.

The ED visits that could be handled in the alternative location were defined by diagnosis code. In this study, a minimum threshold was set by only including health conditions that were seen in more than 2% of all visits at each site. Weinick et al. also used the Billings algorithm that classified ED visits (Billings et al., 2008). ED visit times were also calculated for the hours when the alternative sites were not open. The variable unit studied was patient visits (Weinick et al., 2010).

The results showed that 17% of the visits to the ED were by the uninsured and 26% of the visits by uninsured patients were to retail clinics. The various medical conditions were compared for a very telling picture. Weinick et al. found that 13.7% to 27.1% of all ED visits could have taken place at urgent care centers or retail clinics. The resulting analysis determined the cost savings to national healthcare spending.

Comparison to Existing Research

With the data presented above, it is important to relate this study to previous research studies to recognize the importance and validity of this study. To begin, the NYU study reported by Billings et al. (2008) analyzed ED records, categorizing each visit into one of four categories to describe all types of ED visits ranging from non-emergent, to emergent and not preventable. The NYU study also evaluated hundreds of ED records just to develop a better way to describe ED visits, and revealed how to better identify a properly accessed and utilized ED. The NYU study data was broken down into whether the ED visit was preventable or not.

The NYU study developed a very clear understanding and categorization of ED visits, each of which was thoroughly reviewed and analyzed, patient-by-patient to determine proper categorization, after each visit. The GAHN data used is actual attending physician recorded, and thus coded visit data. The data was not re-categorized after it was collected. It visit data was used as it was originally collected and categorized by E&M level upon presentation to the ED or to the CHC. The GAHN data is very credible since that coding was the basis for billing and reimbursement; the hospitals have an incentive to get it right.

The method GAHN used to define an inappropriate ED visit was using the CPT codes to determine acuity. These CPT codes, or E&M codes, represent what each patient was billed for. The lowest seriousness or the lowest two levels (1 and 2) were used to identify inappropriate ED visits as described by Brault (2008). This was easy to do since the GAHN data were originally collected using CPT codes and E&M codes. The E&M

codes are the levels of seriousness while the CPT codes represent the specific health conditions. These codes are standard in healthcare. The difference between the NYU data and GAHN data is that the NYU study categorized each ED visit after the fact, while the GAHN data was based on real-time, medical decision making and with no subsequent review and categorization.

GAHN data only included patient ED visit data in the set if the E&M level was Level 1 or 2, and if the patient was not subsequently admitted to the hospital. The patient ED visit was categorized by E&M level and within that category, the visits were broken down further into Ambulatory Care Sensitive Condition (ACSC), which is very similar to the NYU study post-discharge categorization. The ACSC ED visit identified the visits as preventable and inappropriate. The result of the NYU study was a clear description of hospital ED visits for better categorization for study and similarly the GAHN approach is useful for this purpose.

According to Rust et al. (2009), the availability of CHCs was associated with lower rates of ED use, especially among uninsured patients. However, the study focused only on rural counties in Georgia, each of which had one hospital and one CHC. The Rust study is in contrast to the GAHN study, which includes three hospitals and five CHCs in an urban area of moderately high population. The two studies, although similar, are studies of two totally different types of geographic areas and healthcare options. A large urban area also has many other variables that would not be found in a sparsely populated rural area. Based on the Rust et al. study and others, it may be unreasonable for GAHN to expect similar outcomes of their efforts.

The strength of research reported by Zahradnik (2008) study was that longitudinal patient data was tracked over a five-year period and compared ED visits with physician access programs. Being able to track specific, uninsured patients over a period of five years and compare enrollees and non-enrollees in a control group, added to the validity of the study, since persons with chronic use of the ED for inappropriate visits could be identified. This particular strength exaggerates both a weakness of the GAHN data collection and analysis as well as an opportunity for GAHN to shift focus and resources to the real problem, the chronic inappropriate ED user. The GAHN database includes only de-identified patient data and does not track patients over time.

Research reported by Zahradnik (2008) is not without its limitations since only one hospital and one physician access program were observed. Rust et al. (2009) revealed if GAHN was only dealing with a limited set of patients in one facility, the impact on decreasing unnecessary ED visits might be much greater, or at the very least, more easily evaluated. To GAHN's credit, they have attempted to tackle a community-wide issue that developing a wider range of alternatives for uninsured people across a number of EDs and CHCs.

Another difference from the Zahradnik (2009) study and the GAHN study is that Zahradnik studied all visits by uninsured patients to the ED, including those where the patient was admitted to the hospital. By contrast, the GAHN study did not include any ED visit data in which a patient was admitted to the hospital. The studies are very similar, but the data included in each study is very different. For instance, an uninsured patient who went to the ED for a headache and ended up admitted to the hospital, would not be included in the GAHN study, but would have been included in the Zahradnik study.

Zahradnik used data like this to develop an IUI to better describe patients who make multiple visits to the ED. The GAHN study did not evaluate frequent ED users. To do that, patient identified data would be required. The GAHN study took a more appropriate approach that focuses on the real problem population.

Weinick et al. (2010) considered a broader range of providers with respect to primary care access. For some communities this would be relevant, but not necessarily GAHN's service area which is primarily low-income individuals. The greater Augusta area is a low-income, urban area where the CHCs and the hospitals are all located in similar types of neighborhoods, within a few miles of one another. Retail clinics and urgent care centers are normally not located in low-income areas, but are located in higher income areas and in the suburbs. For instance, the closest urgent care center to the downtown hospitals is just over eight miles away in North Augusta, South Carolina. North Augusta is not only in another state, but is located in a higher income commercial area, away from the inner city. The other urgent care center is located just over 11 miles away in Martinez, Georgia, a suburban, commercial area away from downtown.

The Weinick et al. (2010) study, although very similar to the GAHN study, compared uninsured patient ED visits to retail clinic visits or urgent care visits for similar reasons, using ICD-9 codes as identifiers. Weinick et al. used the number of visits as the measure for the study and compared the number of uninsured patient ED visits to the number of uninsured patient visits to urgent care or retail clinics. Unlike the GAHN study, the data was not patient-identified. Weinick et al. showed that a 13.7% to 27.1% of ED visits could take place in retail clinics or urgent care centers, thus saving on national healthcare spending. Weinick et al. also found that 26% of the patients visiting retail

clinics or urgent care centers were uninsured, compared to 17% of patients visiting the ED. Although the clinics were not located in the low-income areas, uninsured patients tended to visit retail clinics or urgent care centers.

Additionally, Weinick et al. (2010) also covered a wider geographic area over several states and over a period of less than one year. In comparison, the GAHN study, although geographically centered, involved a four-year study period, which improves validity.

Literature Review Conclusion

The GAHN study will be methodologically similar to the study reported by Weinick et al. (2010). However, instead of using national data sets from urgent care centers, retail clinics and EDs, the GAHN study will use data sets from three EDs and five CHCs located in the greater Augusta, Georgia, area to determine the potential cost savings to the local hospitals.

This study will analyze the number of uninsured patients and the number of patient visits to Augusta area hospital EDs to determine if enrolling these patients in local area community clinics, which are part of the GAHN, can be related to a decrease in the utilization of inappropriate ED visits, or visits which are non-emergent and could be handled more effectively in a primary care setting like a CHC.

Analysis will begin by determining the volume of inappropriate patient visits to three area hospital EDs, which include GHSU Medical Center, Trinity Hospital, and University Hospital. The cost of these visits will be estimated by using industry formulas for average costs, since actual costs are not included in the current GAHN data set. CHC

usage will also be analyzed to determine the volume of new uninsured patients presenting to those clinics.

Augusta area community clinics included in the study are Belle Terrace, Christ Community, Druid Park, Lamar, and St. Vincent de Paul Health Clinics. By better understanding the total inappropriate ED usage for uninsured patients and comparing growth of uncompensated care at the Augusta area community clinics, the results of this study could quantify the cost savings of uninsured patients finding a medical home in area community clinics in the Augusta area.

Chapter III

METHODOLOGY

There is no argument about the continuing problem of inappropriate ED visits. Although by law hospitals that receive Medicare funding cannot deny basic services to any person presenting to the ED[1], there is general agreement that this is the least effective setting for primary care services. Inappropriate ED visits are especially problematic for the patient without health insurance. Though hospitals can bill all patients for services received in the ED, for most self-pay patients the hospitals write-off most, if not all of the charges as uncompensated care. Thus inappropriate ED visits are directly related to payer type. If an insured patient presents at the ED for an inappropriate reason, the hospital receives reimbursement for the visit. These visits add to overcrowding of the ED and are considered inappropriate, but these visits are of less concern since the hospital receives payment. These insured patients use expensive, limited medical resources that should be reserved for patients requiring acute and episodic care. However, as paying customers, the hospitals don't benefit financially by reducing those visits. So the key for communities is to determine how to reduce inappropriate ED visits by uninsured patients

[1] The EMTALA is a statute, which governs when, and how a patient may be (1) refused treatment or (2) transferred from one hospital to another when they are in an unstable medical condition. EMTALA is Section 1867(a) of the Social Security Act, within the section of the U.S. Code, which governs Medicare.

so that hospitals will not continue to lose money and waste valuable resources on such visits. Regardless of the financial impact, by law, hospital EDs must still provide health care services to this population. Identifying the inappropriate ED use by uninsured patients and redirecting those patients to CHCs will not only save the hospitals precious dollars, but will help to identify a possible healthcare home to the many uninsured individuals in the greater Augusta area.

The methodology will focus on addressing two research questions. The primary research question is that as the volume of new uninsured patients increases at the CHCs, the volume of uninsured patient visits for non-emergent ED visits decreases. The alternate research question is that if there is an inverse relationship between ED visits and CHC visits, the cost savings for the area hospitals will exceed the growth in uncompensated care provided by the CHCs. In-depth descriptive statistics and analysis will help to answer these research questions.

Data analysis will examine ED visit data that has been collected from all three area EDs. The data is stratified by zip code, payer type, and other demographics. The only visit data collected were those visits coded as E&M Levels 1 and 2. These two levels typically represent inappropriate ED visits or those visits where the patient would be better served in a primary care setting. Data includes only those ED visits that resulted in a patient discharge and does not include ED visits that resulted in a hospital admission. Not including ED visits that were subsequent hospital admissions further supports the data as representing inappropriate ED visits. Since this study uses archival data that is not identified by patient, and no patient was interviewed for the study, the study is not

considered human subjects research so Institutional Review Board oversight is not required. The letter from the IRB is can be found in the appendix.

The ED visit and clinic visit data were collected and tabulated for each of four years from 2007 to 2010. For each year, the visit data was identified using the source of payment, self-pay or uninsured, as the independent variable. In the data sets, the uninsured data was collected and defined as "self-pay."

Inappropriate ED visits were stratified into the ACSCs, which health care professionals agree that these conditions can be treated in an appropriate health care setting, such as a primary care physician located at a CHC. ACSCs are considered to be preventable conditions, as well as inappropriate conditions for visits to the ED. These ACSCs and associated ED visits are important to the hospitals and clinics in determining the medical focus of the clinics or in future clinics.

The cost of an emergency room visit was estimated using the values from the Medical Expenditure Panel Survey (MEPS) entitled "Emergency Room Services-Median and Mean Expenses per Person With Expense and Distribution of Expenses by Source of Payment for the United States" (2009). Both the mean and median costs were used to determine a conservative and a moderate estimate of the cost of an emergency room visit. These estimates were multiplied by the total number of ED visits for the year determine the total inappropriate ED use cost for the year.

The study defined and analyzed the number of visits in each of the four years from 2007 to 2010, and by multiplying the number of visits in each year with the average cost for a clinic visit determined the annual costs for the CHCs.

Additional capacity data was collected from the CHCs to approximate data that

was not captured in the GAHN datasets. To do so, a brief capacity questionnaire was administered to each CHC to determine the clinic capacity. Clinic capacity was based on the number of visits possible, not on the number of patients. Each clinic reported the clinic visit capacity information for one month, at two different months during the current year resulting in two different months of capacity data. Each clinic also verified the annual visit data that was already collected by GAHN over the last four years. The questionnaire asked for the capacity number and for the number of visits for the month. If the clinic did not reach capacity for the month, the clinic respondent will need to list the various reasoning for clinic capacity not being reached.

Once clinic capacity was determined, a sensitivity analysis was conducted. A sensitivity analysis helped assess the impact that changes in community health care services had on emergency department use. The baseline began with the current visit data at the clinics and the clinics were evaluated on the capacity of each of the clinics. The sensitivity analysis allowed the reviewer to assess the financial impact to the hospitals when clinic capacity is reached. As the hospitals became aware of the full savings of each incremental increase, the hospitals can decide whether or not to put more resources into the clinics; assuming that the clinics are having an effect on reducing inappropriate ED use by providing a medical care home for their clients. This sensitivity model will aid in decision-making for GAHN.

This study is valuable to the field because of the inclusion of data from all local area hospital EDs and several CHCs. There are no real alternatives to the EDs in the local area, which improves the study validity. The GAHN has collected local area visit data over the initial four years of GAHN's existence and is very interested in having the data

analyzed to determine if there has been an impact on the community. This study will be the first analysis of the data since the GAHN's inception in 2007. This analysis will provide a useful decision making tool for the GAHN Board and other community healthcare stakeholders.

Chapter IV

RESULTS

The GAHN was established in 2007 to address the great need for quality, affordable healthcare in Augusta, Georgia, and the surrounding communities. With initial funding from the Healthcare Georgia Foundation, GHSU College of Nursing spearheaded the GAHN initiative in collaboration with key community healthcare stakeholders with the goal of creating a seamless healthcare system to increase access to quality health care services for area citizens.

The GAHN members include six hospitals, seven community clinics, the East Central Health District, and five community service providers whose mission is to improve the health of and reduce the burden of illness in the greater Augusta community by increasing access to quality, cost-effective health care for medically under-served residents. Generally, the mission of GAHN is to create a seamless system of health care in order to provide a health care home for all area residents. With this in mind, when GAHN was established, the organization began to collect ED patient visit data along with CHC patient visit data to track the organization's ability to fulfill its vision and mission. The patient visit data for three area hospital EDs and five area CHCs has been collected, focusing only on E&M Level 1 and Level 2 visits. These visits are characterized as

inappropriate visits. The patients making these visits are the focus of GAHN. The data collected covers the first four years of GAHN's existence.

Patient Visits to the ED

Located in downtown Augusta, there are three hospital EDs from which GAHN collected ED visit data. These hospitals are located in low-income areas. There is one other hospital ED in Augusta, but it is located in a suburban area of Augusta. Eisenhower Army Medical Center is located on Fort Gordon and active Army post, and is not included in this study. The Veterans Affairs (VA) Medical Center is also not included in this study as its clientele is vastly different than the clientele of the safety net hospital EDs of downtown Augusta included in this study.

Data collected for GAHN is centralized in the College of Nursing at GHSU where there is one employee who coordinates and tabulates the data for presentation. Another employee assists in managing and collecting the data, as well as scheduling meetings and keeping the GAHN board apprised of activities of interest to them. GAHN itself does not have any dedicated employees.

As data has been collected over the years, the data has been de-identified and stratified by hospital, according to zip code, ICD-9 code, payer type, etc. Although the data has been collected, it has not always been consistently defined or reported, so inaccuracies exist. Additionally, the person reporting the data from the hospitals or from the clinics may change or the way data is reported has changed.

To understand the extent to which there is a problem with inappropriate ED visits to the ED, Table 2 lists the number of ED E&M Level 1 and 2 visits made by uninsured

patients to each of the hospital EDs and the total number of visits for each year. In the first year that GAHN began collecting data, the total number of visits was highest, and the next three years leveled out, showing no real decrease in the number of visits to the ED uninsured patients. There was a major decrease in ED visits to MCGHI from 2008 to 2009. Over the same two years, ED visits increased at the University Hospital ED at half the rate they decreased at MCGHI. This decrease was short-lived, as the number of visits increased in 2010 at a level higher than in 2008.

Table 2: E&M Level 1 & 2 ED Visits by Uninsured Patients

Year	MCGHI	Trinity	University	TOTAL
2007	3,885	1,673	2,922	8,480
2008	3,002	1,637	2,273	6,912
2009	1,454	1,569	3,071	6,094
2010	2,502	1,100	3,378	6,980

Uninsured patients are not the only people going to the ED for inappropriate reasons. Table 3 lists the total number of E&M Level 1 and Level 2 visits by all payer types. This data shows the highest number of E&M Level 1 and Level 2 visits occurred 2010 and the number of visits was lowest in 2009.

Table 3: E&M Level 1 & 2 Total ED Visits

Year	MCGHI	Trinity	University	TOTAL
2007	11,326	5,227	6,473	23,026
2008	8,874	6,561	7,783	23,218
2009	4,972	6,511	10,455	21,938
2010	9,653	3,964	10,714	24,331

To gain a better understanding of the proportion of visits by uninsured patients, Table 4 lists the percentage of total E&M Level 1 and Level 2 visits by uninsured patients. Even with an outlier in 2009 for MCGHI and the outlier for Trinity in 2010, visits by uninsured patients decrease slightly after the first year decrease of 7% from

2007 to 2008. After 2009, the proportion of uninsured patient visits to the ED for Level 1 and Level 2 visits increases slightly.

Table 4: Percent of Total E&M Level 1&2 Visits by Uninsured Patients

Year	MCGHI	Trinity	University	TOTAL
2007	34.30	32.01	45.14	36.83
2008	33.83	24.95	29.20	29.77
2009	29.24	24.10	29.37	27.78
2010	25.92	27.75	31.53	28.69

Although E&M level 1 and level 2 visits are considered to be inappropriate ED visits, these visits can be reclassified further into ACSC visits by E&M Level 1 and Level 2. These ACSC visits represent preventable conditions; not only are they inappropriate visits, but these conditions could be diagnosed and monitored by a primary care physician. As can be seen in Table 5, total ACSC visits decreased in 2008, but remained steady over the next three years.

Table 5: ACSC ED Visits by E&M Level (Preventable Conditions) by Uninsured Patients

Year	Level 1	Level 2	TOTAL
2007	339	2,276	2,615
2008	130	1,869	1,999
2009	125	1,512	1,637
2010	56	1,987	2,043

The total number of ACSC visits by E&M Level 1 and Level 2 are shown in Table 6. Like the uninsured patient visits, total ACSC visits decreased in 2008, but remained steady over the next three years.

Table 6: ACSC ED Visits by E&M Level (Preventable Conditions) by Uninsured Patients

Year	Level 1	Level 2	TOTAL
2007	1,178	6,401	7,579
2008	350	6,320	6,670
2009	424	5,400	5,824
2010	129	6,518	6,647

Table 7 reveals that the percentage of ACSC visits by uninsured patients showed the same pattern, decreasing in 2008 and remaining steady over the next three years. Most importantly, the percent of uninsured patient ACSC visits was higher than the percentage of uninsured patient E&M Level 1 and Level 2 visits as shown in Table 3, by at least 10% each year.

Table 7: Percent of Total ACSC Visits by E&M Level by Uninsured Patients

Year	Level 1	Level 2	Total ACSCs Visits
2007	28.78	35.56	34.50
2008	37.14	29.57	29.97
2009	29.48	28.00	28.11
2010	43.41	30.48	30.74

ED Visit Costs

Each of the inappropriate visits by uninsured patients can be assessed in terms of the cost to the hospitals. Since the cost of each visit was not collected, the median and mean costs for uninsured patient ED visits as reported by the MEPS will be used. MEPS is the most complete source of data on the cost and use of health care and health insurance coverage[2]. The median cost of an ED visit by an uninsured patient is $648. Using the median cost represents a more conservative analysis tool. The total number of uninsured patient visits for E&M Level 1 and Level 2, multiplied by the median cost for each hospital and for each year, is listed in Table 8.

[2] Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey (MEPS), 2012

Table 8: Median Cost of E&M Level 1 & 2 ED Visits by Uninsured Patients

ED MEDIAN COST = $648 for uninsured patients				
Year	MCGHI	TRINITY	UNIVERSITY	TOTAL
2007	$2,517,480	$1,084,104	$1,893,456	$5,495,040
2008	$1,945,296	$1,060,776	$1,472,904	$4,478,976
2009	$942,192	$1,016,712	$1,990,008	$3,948,912
2010	$1,621,296	$712,800	$2,188,944	$4,523,040

The mean cost of a visit to the ED by an uninsured patient, as reported by MEPS, is $1,397 per visit. Using data initially reported in Table 2 and multiplying those visits by the mean cost per visit leads to the data listed in Table 9. The total costs for the hospitals doubles using this calculation, which may be closer to the actual cost of an ED visit.

Table 9: Mean Cost of E&M Level 1 & 2 ED Visits by Uninsured Patients

ED MEAN COST = $1,397 for uninsured patients				
Year	MCGHI	TRINITY	UNIVERSITY	TOTAL COST
2007	$5,427,345	$2,337,181	$4,082,034	$11,846,560
2008	$4,193,794	$2,286,889	$3,175,381	$9,656,064
2009	$2,031,238	$2,191,893	$4,290,187	$8,513,318
2010	$3,495,294	$1,536,700	$4,719,066	$9,751,060

These uninsured E&M Level 1 and Level 2 visits by uninsured patients show an enormous loss to the hospitals in uncompensated care. These costs can more accurately be identified by associating the number of ACSC visits with the ED visit cost, thus resulting in the total cost for the hospitals. Table 10 uses the median cost of $648 for an ED visit by an uninsured patient while Table 11 uses the mean cost of $1,397.

Table 10: Median Cost for ACSC ED Visits by Uninsured Patients

ED MEDIAN COST = $648 for uninsured patients			
Data	Level 1	Level 2	Total Cost
2007	$219,672	$1,474,848	$1,694,520
2008	$84,240	$1,211,112	$1,295,352
2009	$81,000	$979,776	$1,060,776
2010	$36,288	$1,287,576	$1,323,864

Table 11: Mean Cost for ACSC ED Visits by Uninsured Patients

ED MEAN COST = $1,397 for uninsured patients			
Date	Level 1	Level 2	Total Cost
2007	$473,583	$3,179,572	$3,653,155
2008	$181,610	$2,610,993	$2,792,603
2009	$174,625	$2,112,264	$2,286,889
2010	$78,232	$2,775,839	$2,854,071

CHC Visits and Capacity

There are four CHCs located in the downtown Augusta area and one clinic located near downtown, in an adjacent low-income area. The five clinic visit data are listed below in Table 12. The clinics have been a part of GAHN since 2007, except for St. Vincent, which has been a member since 2008. Christ Community became a member of GAHN in 2007, but their services have grown exponentially over the four years. Each of the clinics focuses on serving individuals without health insurance, so the visit data is not broken down by payer type, because for the vast majority of clinic visits, patients are uninsured. These clinics are not free clinics since they do charge a co-payment based on a sliding scale. Still, the cost of a visit to a CHC is vastly lower than a similar visit to the ED.

Table 12 lists the number of patient visits to area clinics for each year. The CHCs report an increase in visits overall, and the number of visits greatly exceeds the number of comparable visits by uninsured patients at the EDs. Even with the increase in CHC visits over the four-year period, there was no significant decrease in visits in local areal EDs.

Table 12: CHC Patient Visits

	2007	2008	2009	2010
Druid Park	3,239	2,033	2,025	2,623
Belle Terrace	6,172	8,400	8,504	5,711
Lamar	4,051	3,171	4,340	5,075
St. Vincent	1,256	2,380	2,280	3,147
Christ Community	161	3,791	6,553	9,454
Total	14,879	19,775	23,702	26,010

In 2012, GAHN asked area clinics to report their annual visit totals and to also report their monthly visit capacity. Visit capacity was captured in two points in time, three months apart. The capacity numbers for each month varied for two clinics, but remained the same for the other three clinics. To adjust for this difference, Table 13 lists an estimate of the minimum and maximum annual capacity for each clinic based on data collected during two months prior and those monthly totals multiplied by twelve. Annual capacity will vary, but is based on those two monthly measures.

Table 13: Maximum Capacity per CHC

	min	max
Druid Park	5,400	5,400
Belle Terrace	8,640	8,640
Lamar	8,160	10,080
St. Vincent	3,408	3,408
Christ Community	14,076	14,208
Total	39,684	41,736

As can be seen, none of the clinics met their capacity for any given year. Each of the clinics reported various reasons for not reaching their monthly capacity. Of course, capacity was recorded in 2012, and the data represents estimates from the four prior years as compared to the current number of visits the clinics could absorb. If the general assumption is that if the number of visits at the clinics would rise, it follows that the number of visits at the area EDs would decrease. The number of visits at the clinics has

steadily increased over the four-year study period, while the number of ED visits has not decreased. Therefore the research question is not supported. Increased number of visits at CHCs does not decrease area ED visits. There is no direct correlation, but even anecdotally, there is no relationship.

Using the CHC average cost of $130 per medical visit, the following scenario results. If the CHCs are not working to capacity, those patients could be going to the ED. The cost of those visits in a CHC would cost significantly less than those visits in the ED, especially at a CHC average cost of $130 per visit. The minimum savings is the most conservative estimate which, using a minimum capacity and median ED cost for an uninsured patient, would total just over $7 million. The most aggressive estimate, using the maximum capacity estimate and the mean ED cost of $1,397 for an uninsured patient would result in savings of nearly $20 million.

Table 14: Cost Savings at CHC Capacity

Difference between Actual Clinic Visits & CHC Capacity		ED Visit Cost for an Uninsured Patient		Cost of ED visits, not using CHC Capacity	CHC Cost for Difference	SAVINGS if patients are diverted to CHC, which is serving capacity
Min	13,674	Median	$648	$8,860,752	$1,777,620	$7,083,132
Max	15,726	Median	$648	$10,190,448	$2,044,380	$8,146,068
Min	13,674	Mean	$1,397	$19,102,578	$1,777,620	$17,324,958
Max	15,726	Mean	$1,397	$21,969,222	$2,044,380	$19,924,842

Overview of Significant Findings

Research Question 1

This study focused on two research questions identified from the GAHN mission statement to determine if the mission of GAHN is being fulfilled. Using data supplied by GAHN to test the research question, the first question states that as the volume of new

uninsured patients increases at the clinics, the volume of uninsured patient visits for non-emergent ED visits decreases. The four years of data analyzed illustrate that from the first year to the second year, 2007 to 2008, the number of non-emergent ED visits decreased, but from 2008 to 2010, the number of non-emergent visits slightly increased each year. There is a decrease in non-emergent ED visits comparing 2007 to 2010, a decrease of 7.95%, but once 2007 is removed, there is a slight increase in visits each year, and 3% increase overall.

Table 15: Number of Uninsured Patient Inappropriate ED Visits

	2007	2008	2009	2010
Number of ED Visits	44,562	39,809	40,136	41,019
Percent Decrease in ED Visits by Uninsured Patients				
		2007 to 2008	2008 to 2009	2009 to 2010
Annual Decrease		10.67	-0.82	-2.20
Decrease from 2007 to 2010		7.95		
Decrease from 2008 to 2010		-3.04		

As expected, CHC visits increased each year, with the greatest increase in visits (4,896) occurring from 2007 to 2008, an increase of nearly 33%.

Table 16: Number of Patient Visits to CHCs

	2007	2008	2009	2010
Number of ED Visits	14,879	19,775	23,702	26,010
Percent Decrease in ED Visits by Uninsured Patients				
		2007 to 2008	2008 to 2009	2009 to 2010
Annual Increase		32.91	19.86	9.74
Increase from 2007 to 2010		74.81		
Increase from 2008 to 2010		31.53		

Although ED visits did decrease over the same time period, the number of inappropriate visits did not continue to decrease, but rather increased slightly. Because of the slight increase over three years, the hypothesis is not supported. The CHC patient visits nearly doubled from 2007 to 2010, compared to inappropriate ED visits by

uninsured patients, which decreased over the same period by 8%. If there was an inverse relationship between ED visits and CHC visits, these numbers should be much closer. The comparison of data from 2008 to 2010 is even more indicative of the unsupported hypothesis in that CHC patient visits increased over 31% while inappropriate ED visits also increased 3%.

There could be an argument supporting the hypothesis when comparing the number of inappropriate and preventable uninsured patient ED visits to the number of CHC visits. There is a decrease in the number of ED visits from 2007 to 2008 and from 2008 to 2009, but there is an equally significant increase in the number of ED visits from 2009 to 2010. Overall, from 2007 to 2010, the decrease is 12.30%, but only a decrease of less than 1% from 2008 to 2010. Similarly the preventable, inappropriate ED visits by uninsured patients remained steady over the three-year period from 2008 to 2010, while CHC visits increased at a much higher rate.

Table 17: Number of Uninsured patient Preventable, Inappropriate ED Visits

	2007	2008	2009	2010
Number of ED Visits	7,579	6,670	5,824	6,647
Percent Decrease in ED Visits by Uninsured Patients				
		2007 to 2008	2008 to 2009	2009 to 2010
Annual Decrease		11.99	12.68	-14.13
Decrease from 2007 to 2010		12.30		
Decrease from 2008 to 2010		0.34		

The total number of ED visits also does not reveal an inverse relationship between a decrease in the number of preventable, inappropriate uninsured patient ED visits and an increase in CHC visits either.

Research Question 2

The alternative research question suggests that the cost savings for the area hospitals will exceed the growth in uncompensated care provided by the clinics. Since the first research question was not supported, the second, subordinate research question does not hold up either. Based on the GAHN data for ED visits by uninsured patients, with no decrease in ED visits, there is no savings to the hospitals.

Nearly 30% of the total number of patient visits to the three hospital EDs are considered to be avoidable visits. Of those visits, uninsured patients account for nearly 20%. By definition inappropriate visits are more suitable for primary care physicians and for those patients who are uninsured, CHCs could provide a medical home, especially since many primary care physicians are less likely to accept uninsured patients. In the meantime, those uninsured patients are visiting the ED, generating unnecessary and usually uncompensated charges of over $4 million to over $9 million annually, depending on which ED visit estimate is used. Table 18 lists the same patterns of financial loss, basing the financial estimates on the mean and median cost of an ED visit by an uninsured patient.

Table 18: Annual Loss in Avoidable Visits by Uninsured Patients

	Number of E&M 1 & 2 ED Visits by Uninsured Patients	Annual Loss ED Visit Cost $1,397 (Mean)	Annual Loss ED Visit Cost $648 (Median)
2007	8,480	$11,846,560	$5,495,040
2008	6,912	$9,656,064	$4,478,976
2009	6,094	$8,513,318	$3,948,912
2010	6,980	$9,751,060	$4,523,040

The capacity of CHCs has not been reached; so many more of these uninsured patients could be directed to and accommodated by CHCs. If so, by filling excess clinic

capacity presumably with patients who normally visit the ED for unnecessary visits, savings to area EDs could be realized. Table 19 lists the savings that could occur.

Table 19: Savings Hospitals Could Realize through CHC Capacity Being Met with Unnecessary ED Visits

Difference between Actual Clinic Visits & CHC Capacity		ED Visit Cost for an Uninsured Patient		Cost of ED visits, not using CHC Capacity	CHC Cost for Difference	SAVINGS if patients are diverted to CHC, which is serving capacity
Min	13,674	Median	$648	$8,860,752	$1,777,620	$7,083,132
Max	15,726	Median	$648	$10,190,448	$2,044,380	$8,146,068
Min	13,674	Mean	$1,397	$19,102,578	$1,777,620	$17,324,958
Max	15,726	Mean	$1,397	$21,969,222	$2,044,380	$19,924,842

Chapter V

DISCUSSION

Limitations

Although the study shows some strong relationships, there are some limitations. First, GAHN only tabulates descriptive statistics and does not use patient-identified data. With this approach, the GAHN study cannot definitively show causality, but the study makes a strong case for impact on inappropriate ED visits. This leads to the primary limitation of the study, although unavoidable, of the de-identified patient data used in the study. Patient-identified data would have allowed for patient tracking by illness and by location, and whether an ED visit occurred before or after a clinic visit. This would have allowed for individual tracking to determine the real value of the clinics to the hospitals. Patient-identified data was used in both the Zahradnik (2009) study and the Rust et al. (2009) study of rural counties in which the clinics did have a positive impact on the hospitals. The ability to track patients from the ED to the clinics enhances the validity of the study because the researcher would know exactly how many times a specific patient went to the ED after visiting a clinic, and would know exactly what the patient went to the ED for and if that reason was addressed at a clinic visit. Identified patient data could be tracked through time-series analysis and would offer a greater breadth of understanding of the real relationships between the hospitals and the CHCs. Using patient identified data would be integral to improving services if a referral service or enhanced GAHN services were introduced.

Another limitation resulted when gathering the data from the GAHN administrators. There is another hospital that could have been included in the data but was removed from the study due to inconsistent and incomplete data. Although there is another hospital ED counted among the Augusta area hospitals, the excluded hospital ED is a for-profit hospital with greater turnover, causing data reporting inconsistency. It would have been very helpful to include that hospital's ED patient visit data, but the hospital had gone through several leadership changes over the four-year GAHN study period, so understandably, there has been a different level of consistency and dedication to GAHN. With that, the first year of data collection, 2007, was incomplete so it could not be used. Although data for 2011 was requested, the data was never submitted to GAHN, so a complete picture could not develop. As a result, the researcher did not include that hospital in the study because it would have skewed the annual data and would not have allowed trends to appear. Although the inclusion of this hospital's annually reported data would have counted all Augusta area hospitals, the exclusion of the data did not invalidate the study.

Another limitation of the data arose upon analysis. GAHN received data from each of the hospitals and clinics for each year and thoroughly reviewed it for consistency. This data was collected and tabulated for each year from 2007 through 2011. However, in 2012, GAHN surveyed each of the clinics for their capacity and also asked questions about the total number of visits to each clinic for each year, 2007 through 2011. When the capacity surveys were returned, the number of visits did not match the annual tabulated data that was previously collected. Most of the numbers were not that much different, but it did raise a concern. One of the clinic's annual totals exceeded the reported capacity

listed on the same survey. For instance, the survey reported that the capacity of the clinic was 8,500 patient visits while the total number of visits reported exceeded 12,000 visits for the year. Further examination of the data revealed that 12,000 patient visits was grossly inaccurate when compared to the annual tabulated data. In that instance, the annual tabulated number of patient visits was used for the study.

This inconsistency could be attributed to several different variables, which could be alleviated with proper training. The person, who reported the data for the capacity survey in 2012, was not the same person who reported the annual patient visit data to GAHN. The two people may have had a different understanding of the data needs of GAHN, thus reporting what they thought was the accurate information. Different people and even different clinics could define patients visit differently. It seems that some clinics could have been defining patient encounters and patients as different numbers in some clinics and the same number in different clinics. When GAHN collects patient visits, it is concerned with a patient encounter. An encounter is defined as a patient visit to a clinic. A clinic may have 5,000 patients but if each of those patients visits the clinic three times, the result is 15,000 visits. This study is focused on visits (patient encounters) not just the number of patients. It is not clear if this definition was consistently used. GAHN administrators state that the annually tabulated data was consistent, which is the data that was used in the study for the clinics.

Careful Examination

In 2007, the number of inappropriate ED visits by uninsured patients was the highest of the four-year study period. From 2007 to 2008, the largest decrease in inappropriate ED visits by uninsured patients occurred, while at the same time, the largest

increase in clinic visits occurred. Although a direct causal relationship cannot be proven, there is a strong relationship. The data illustrates that the CHCs contributed to the large reduction of inappropriate visits in 2008, since there was a 10% decline in inappropriate ED visits by uninsured patients (4,753 visits) and a 30% increase in the number of CHC visits (4,896 visits). This means that, because of the differential in the total number of visits, *for every thirty patient visits at a clinic, there could be a decrease in inappropriate ED visits by one visit*.

During each of the three years following the first year inverse relationship, the number of ED visits by uninsured patients and CHC visits remain somewhat steady. The increase in the number of CHC visits increased each year, but did not increase by 30%, therefore, there was not an effect on ED visits. This can be further evidence that there must be a large change in CHC visits before there is an effect on uninsured hospital ED visits. As a matter of fact, inappropriate ED visits by uninsured patients continue to rise each year from 2008 to 2010, even while health clinic visits also increase. The CHC visits increase each year, having no effect on inappropriate ED visits by uninsured patients. The three years following the inverse relationship from 2007 to 2008, illustrate that there is not an inverse relationship between ED visits and clinic visits. Further research following this year should continue to monitor these relationships.

GAHN did report some referrals to CHCs from area hospitals, which increased in number each year. The term 'referral' though, is little more than an emergency room nurse giving a list of CHCs to the patient for primary care follow-up. Normally a doctor would suggest a follow-up visit to the patient's primary care physician, but if a patient did not have a primary care physician, the nurse could offer a list of resources where a

patient could follow-up. Nurses and doctors are not allowed, by law, to refer patients to specific doctors or clinics. The nurse providing information about available clinics could be one of the reasons for the increase in the number of visits to CHCs, but these CHC visits are not decreasing the ED visits, suggesting that the chronic inappropriate ED users are not affected.

Table 20: Number of Referrals to CHCs

Year	MCGHI	Trinity	University	TOTAL
2007	41	3	406	450
2008	76	5	534	615
2009	82	98	481	661
2010	437	215	909	1561

GAHN hospitals and the CHCs are not currently reducing unnecessary visits, but the data shows that there are plenty of ACSC visits to the EDs each year and a greater percentage of those visits are by uninsured patients. Implementing programs that truly redirect (or manage) patients to appropriate primary care settings rather than an ED for preventable, avoidable conditions would provide significant savings to hospitals. Redirecting these patients to primary care homes, such as CHCs would create a more efficient health care delivery system as well (Choudhry et al., 2007).

The mere existence of GAHN seems to not be enough to have the desired impact. There is no tangible redirection program being implemented. The nurse–provided information/referral system is a good start, but a true referral system would actually identify, call, and make an appointment with a primary care physician for follow-up. If there is a thorough training program for intake and triage specialists to coordinate referrals for uninsured patients visiting for inappropriate reasons, this referral system may help to lower some of the inappropriate ED visits. This training program and setting up a

referral process would take additional personnel of which GAHN does not have. Of course, uninsured patients could be referred but never go to the clinic for an appointment. A more intensive referral system, such a case management system would need to be implemented for the best results.

According to the 2009 definition by the Case Management Society of America, the definition of case management is:

> a collaborative process of assessment, planning, facilitation, care coordination, evaluation, and advocacy for options and services to meet an individual's and family's comprehensive health needs through communication and available resources to promote quality cost-effective outcomes (8).

Uninsured patients who are frequent users of the ED for inappropriate reasons should be the main focus of this program. Each high frequency, uninsured ED user would be paired with a case manager who would conduct a comprehensive assessment of the client's health and health needs. The case manager would facilitate communications and coordination between primary care physicians and clinics, and educate the client on the appropriate use of health care services, as defined by the Case Management Society of America (CMSA) (2009). These clients would be identified at the ED upon triage and a case manager would follow up with the client and track and manage him or her through the ED and to the CHC, if that is the best health care home for that individual. Studies have shown that having a regular health care provider is a better predictor of seeking care than having insurance alone, and having both make the greatest impact on health care outcomes (Choudhry et al., 2007).

Managing uninsured individuals who are the most likely to return to the ED for inappropriate or preventable reasons could be facilitated through individual care plans

especially for the chronic abusers of ED for primary care. A study by Pope and et al. (2000) at an inner city medical center showed a dramatic reduction in the number of visits to the ED by patients enrolled in a difficult-case management program. These difficult cases were frequent ED users that had psycho-social issues in addition to medical issues; patients that would be better treated in a primary care clinic. The program was successful with upwards of 20 to 30 referrals each month (Pope et al., 2000). Shumway et al. (2007) reporting on the cost-effectiveness of clinical case management for ED frequent users discovered that case management does appear to be more cost effective. This type of system might also be effective for GAHN since GAHN has a strong advisory board which includes representatives from hospitals, CHCs and other community health organizations which could oversee, advise and coordinate communication among the various case managers and the health care organizations.

Looking at the possible savings that the CHCs could provide if working at capacity and filling that capacity with those inappropriately using hospital EDs for primary care suggests that the minimum savings is approximately $7 million. Focusing on reducing ED visits by 2,000; GAHN would need to hire eight case managers with a caseload of about 250. This is the caseload suggested by Balstand and Springer (2006). Hiring eight case managers at $40,000 plus benefits would cost to GAHN only $430,000. For the best functioning of the case managers, there would need to be one supervisor for every five case managers and one administrative assistant. This case management unit would be extremely beneficial, and cost effective especially covering each of the hospitals downtown and working together as a unit of GAHN.

If these case managers focused on the most frequent ED users and focused on those ED users with preventable conditions (ACSC), they could reduce inappropriate ED use. Eight case managers could each have a caseload large enough to cover the 30% of the avoidable ED visits, thus reducing ED use by 10%, saving the hospitals, at the most conservative estimate (~$648 per ED visit by an uninsured patient), approximately $3.2 million. An investment of $430,000 would be well worth the possible savings.

CHCs are experiencing increases in visits, despite operational challenges, which include capacity issues, reliance on volunteer staffing in some cases, and a limited number of physicians. One of the GAHN CHCs reported a provider out sick for 15 days and 165 no-shows for the month. Another clinic reported 244 no-shows for one month. Another clinic was closed for a full week while a physician was out sick. Clinic no-shows could be a result of the long wait times reflected in the survey.

Focusing on ways to expand or even continue services with a substitute physician, or on-call physicians, possibly using retired physicians who could fill in while other physicians are out sick may be a way to alleviate long wait times, closing a clinic, or having to reduce appointments due to lack of physician availability. It seems that the clinics may need to focus on improved clinic physician management and scheduling to help reduce unproductive clinic times. Another role for GAHN might be in managing a physician/nurse practitioner registry where slots are filled from the pool to avoid clinic downtime. There will be a benefit to the hospitals in the future by addressing clinic productivity in the form of prevented or managed chronic disease that often produces an ambulatory care sensitive ED visit.

The results of the GAHN study could not prove that CHC visits reduce

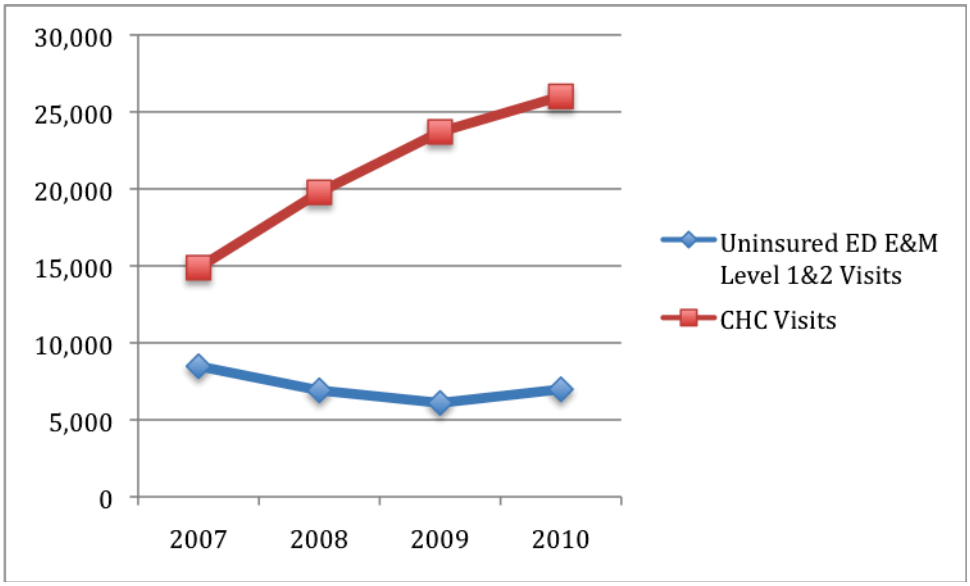
inappropriate ED visits by uninsured patients as reported by Rust et al. (2008). Rust (2008) was able to show causality, which the GAHN study could not do using de-identified patient information. On the other hand, the GAHN study and the Billings et al. (2000) study of New York City EDs both illustrated that inappropriate use was similar. Both studies basically monitored ED visits, which provided a better understanding of why people go to the ED. No matter how inappropriate ED visits are defined; both studies found that there are a high proportion of inappropriate ED visits by uninsured patients, which would be more appropriate in a primary care facility.

Both the GAHN and the NYU study concluded that it is important to understand why patients are using the ED for their health care needs and to identify ways to improve access to primary care and reduce reliance on the ED. The suggestions for improvement of GAHN are similar to the suggestions for improvement in NYU study, which included reducing wait times at clinics and doctors' offices, expanding office hours, and enhancing phone consultations. Additionally, by coordinating care between physicians and EDs, identifying repeat visitors, and linking patients to a primary care physician, the NYU study suggestions included similar remedies as the GAHN study. In essence, with de-identified data directly from the ED, the GAHN study resulted in some very valuable observations for better management and future improvements.

Recommendations for Further Research

Despite the lack of reduction overall in unnecessary ED visits, CHC visits are increasing, as illustrated in Figure 1.

Figure 1: Annual CHC and ED Visits



The question remains, where are these new clinic visits coming from? The source of the increase in CHC visits is likely the result of persons in the community lacking access to health care because they lack health insurance. When a new patient contacts a doctor's office, the first question the doctor's office asks is about insurance status. If the potential patient has no insurance, then the physician's office normally states that it is not accepting new patients at this time or the next appointment is several months away. Consequently, CHCs and hospital outpatient departments serve a higher proportion of uninsured patients. Uninsured patients only represent about 9% of private office-based providers' caseload. There is a high number of private practitioners so the aggregate number of visits for uninsured patients seems larger (Fairbrother et al., 2003).

The effect of uninsured individuals having a source of primary care at the clinics is not currently being realized in the EDs, but the clinics should have an impact on unnecessary ED usage in the future through prevention and management of chronic disease. Since there is no reduction in unnecessary ED visits, it is likely that there are

individuals who are habitual users of the ED for inappropriate conditions. This group is already in the habit of making multiple trips to the ED. Referrals to the clinics for some reason does not change their habit, but referrals have not been used by GAHN to a sufficient degree to determine if this would have any impact. Breaking habitual ED usage will likely require specialized case management. GAHN would be better positioned to provide referrals to CHCs along with a case management approach to those populations.

Redirecting patients is not the entire story. Future studies could determine the need for a physician/nurse practitioner shared registry so the clinics could reduce downtime or address unusual demand. This type of study also would not require identified patient data, but the clinics would need to keep logs of physician absences, re-scheduled or cancelled appointments, etc. Capacity models could continue to be developed for both clinic physical capacity and patient capacity based on the number of physicians. Redirecting patients is important but only tells a part of the story. Nevertheless, CHCs are making a positive impact on community health.

Further research could also focus on the geographic component of the data. Since the hospital ED visit data is identified by zip code, the ED visit data could be mapped in a GIS. The zip code visit data could be over-layed with poverty levels, education levels, and other demographic layers to develop a better visual understanding of what type of clientele are presenting at the various EDs.

The ICD-9 codes are also divided up within each zip code, which would enable further visual understanding of the various acute and chronic conditions occurring in specific areas. Concentration levels of the most common diagnosis could be identified in

each zip code area. This information could be used by the hospitals and clinics for public health education and specialty clinic development. The GIS information could also be used to better refer ED users to CHCs closer to their homes. Using GIS area buffers would also allow the CHCs to determine their service areas and determine if there are areas of downtown Augusta, or other high poverty areas, which could be better served by a clinic. Using geographic information of clinic patients would also help to identify areas for specific advertisement of clinic services and hours. Geographic information systems could greatly benefit the hospitals and the clinics in better understanding their clientele and the needs of their clientele.

The changes in patient volume and the number of patient visits as a result of the passage of the Patient Protection and Affordable Care Act (PPACA) could be compared to the four years of data already collected. In other words, a study of the policy implications of PPACA on visits by uninsured patients to CHCs and emergency EDs could be studied in the future. Since PPACA aims to decrease the number of Americans without health insurance, it would be interesting to see the effect PPACA has on the CHCs in years to come.

The GAHN data is rich in possibilities for further study. With the emergence of Belle Terrace Health and Wellness Center being designated a Federally Qualified Health Clinic (FQHC) in 2012, the center should have quite an affect on the community. The Department of Health and Human Services also awarded the clinic $4.9 million for the construction of a new clinic next door to its current clinic which will double the number of patients admitted. This vast increase in patients that will occur once construction is complete will provide a great test of the findings in this study. Will an increase in patients

in such a high number reduce ED visits for inappropriate reasons? Continuation of visit data collection for several years to come will enable the duplication of this study to verify its findings, or possibly prove them wrong. Whatever happens, the Belle Terrace FQHC designation will only help to improve the community's continuum of care.

REFERENCES

Ashley, Dennis W. 2010. "The Quest for Sustainable Trauma Funding: The Georgia Story." Bulletin of the American College of Surgeons, October: 17-21.

Asplin, Brent R. 2004. "Show Me the Money! Managing Access, Outcomes, and Cost in High-Risk Populations." *Annals of Emergency Medicine* 43(2): 174-177.

Ayanian, John Z., Joel S. Weissman, Eric C. Schneider, Jack A. Ginsburg, Alan M. Zaslavsky. 2000. "Unmet Health Needs of Uninsured Adults in the United States. *The Journal of the American Medical Association*, 284 (16): 2061-2069.

Babcock Irvin, Charlene, James M. Fox and Kevin Pothoven. 2003. "Financial Impact on Emergency Physicians for Nonreimbursed Care for the Uninsured." *Annals of Emergency Medicine,* 42(4) October: 571-576.

Balstad, Amy and Pamela Springer. 2006. "Quantifying Case Management Workloads, Development of the PACE Tool." *Lippincott's Case Management,* 11(6), 291-302.

Billings, John, Nina Parikh, and Tod Mijanovich. 2000. "Emergency Room Use: The New York Story." *The Commonwealth Fund Issue Brief*, November. www.cmwf.org (Last accessed on March 2, 2012).

Brault, Andrea. 2008. "E&M vs. Observation Care." February. http://client.emergencygroupsoffice.com/ContentHandler.ashx?ID=33 (February 25, 2012).

Case Management Society of America (CMSA). 2010. *Standards of Practice for Case Management.*

Centers for Medicare and Medicaid Services (CMS). 2009. "Exhibit 179 – Information on Medicare Participation Federally Qualified Health Center (FQHC)." Rev. 40, 03-20-09. Accessed September 9, 2012: http://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/som107_exhibit_179.pdf

Choudhry, Lina, Mackenzie Douglass, Jaclyn Lewis, Courtney Howard Olson, Rachel Osterman, and Paras Shah. 2007. "The Impact of Community Health Centers & Community-Affiliated Health Plans on Emergency Department Use." Association for Community Affiliated Plans and National Association of Community Health Centers, Inc. Last Accessed October 3, 2012: http://www.nachc.com/client/documents/publications-resources/IB_EMER_07.pdf

Cunningham, Peter. 2011. "Nonurgent Use of Hospital Emergency Departments." Hearing on "Diverting Non-urgent Emergency Room Use: Can It Provide Better are and Lower Costs?" U.S. Senate, Health, Education, Labor and Pensions Committee, Subcommittee on Primary Health and Aging: May 11, 2011.

Custer, William S., Patricia Ketsche, and Christian King. 2009. "Sources of Health Insurance Coverage in Georgia." Tabulations of the March 2010 Annual Social and Economic Supplement to the Current Population Survey. Center for Health Services Research Institute of Health Administration: Georgia State University.

Davidson, Pamela L., Ronald M. Andersen, Roberta Wyn, and E. Richard Brown. 2004. "A Framework for Evaluating Safety-Net and Other Community-Level Factors on Access for Low-Income Populations." *Inquiry*, 41(1), 21-38.

Davidson, Richard A., Angela Giancola, Andrea Gast, Janice Ho, and Rhondda Waddell. 2003. "Evaluation of Access, A Primary Care Program for Indigent Patients: Inpatient and Emergency Room Utilization." *Journal of Community Health* 28(1): 59-64.

DeLia, Derek and Joel C. Cantor. 2009. "Emergency Department Utilization and Capacity." Robert Wood Johnson Foundation. Research Report.

Ehrlich, Natalie J., Farzana Tasmin, Haytham Safi, Jonathan Barnett, and Barbara Lasley. 2004. "Pilot Study of ER Utilization at Tulsa Hospitals." Journal of the Oklahoma State Medical Association 97(2): 64-68.

E/M (Emergency/Management) University. 2012. "Definitions." http://emuniversity.com/Definitions.html (Last accessed 11/2/2012)

Fairbrother, Gerry, Michael K. Gusmano, Heidi L. Park, and Roberta Scheinmann. 2003. "Care For The Uninsured In General Internists' Private Offices". *Health Affairs* 22,6: 217-224.

Felland, Laurie E., Robert E. Hurley and Nicole M. Kemper. 2008. "Safety Net Hospital Emergency Departments: Creating Safety Valves for Non-Urgent Care." (Issue Brief No. 120.) Washington, D.C.: Center for Studying Health System Change.

Fordyce, James, Fidela S.J. Blank, Penelope Pekow, Howard A. Smithline, George Ritter, Stephen Gehlbach, Evan Benjamin and Philip L. Henneman. 2003. "Errors in a Busy Emergency Department." *Annals of Emergency Medicine*, 42 (3), September: 324-333.

Gore, Laura. 2010. "ER Visits Increase at Twice the Rate of U.S. Population." *American College of Emergency Physicians*. August 11. www.acep.org (Last accessed 3/2/2012).

Greater Augusta Healthcare Network. GHSU College of Nursing. http://www.georgiahealth.edu/nursing/gahn/index.html (Last accessed 1/8/2013)

Gunn, Patrick P., Allen M. Fremont, Melissa Bottrell, Lisa R. Shugarman, Jolene Galegher and Tora Bikson. (2004). "The Health Insurance Portability and Acccountability Act Privacy Rule: A Practical Guide for Researchers." *Medical Care* 42,4: 321-327.

Kamoie, Brian and James G. Hodge, Jr. (2004). "HIPAA's Implications for Public Health Policy and Practice: Guidance from the CDC." *Public Health Reports,* 119, 2: 216-219.

Kleiman, Michael B. 1979. "Emergency Room Use and Access to Alternative Sources of Care." *Sociology of Health and Illness* 1(3): 318-329.

Lee, N. Genell. 2000. "Legal Issues: Update o EMTALA." *The American Journal on Nursing*, 100,9: 57-59.

MacDonald-Thompson, Karen and Doris F. Glick. 1999. 'Cost Analysis of Emergency Room Use by Low-Income Patients." *Nursing Economics* 17 3:142-155.

Malone, Ruth E. 1998. "Whither the Almshouse? Overutilization and the Role of the Emergency Department." *Journal of Health Politics, Policy and Law* (23) 5: 796-832.

Medical Expenditure Panel Survey (MEPS). 2009. Table 6: Emergency Room Services-Median and Mean Expenses per Person With Expense and Distribution of Expenses by Source of Payment: United States, *Agency for Healthcare Research and Quality (AHRQ).*

Meyer, Jack A. 2004. "Safety Net Hospitals: A Vital Resource for the United States." Washington, D.C.: Economic and Social Research Institute. Accessed September 9, 2012: http://www.esresearch.org/publications/NAPH_final.pdf

National Association ACHC, The Robert Graham Center, and Capital Link. 2007. "Access Granted: The Primary Care Payoff." August. www.nachc.com/research (March 10, 2012).

National Association of Community Health Centers, Inc. (NACHC) 2008. "United States Health Center Fact Sheet, 2008." Accessed September 9, 2012: http://www.nachc.com/client/documents/United%20States%20FSv2.pdf

Nelson, Karin, Rosa Elena Garcia, Julie Brown, Carol M. Mangione, Thomas A. Louis, Emmett Keeler, and Shan Cretin. (2002). "Do patient Consent Procedures Affect Participation Rates in Health Services Research?" *Medical Care,* 40,4: 283-388.

Newton, Manya F., Carla C. Keirns, Rebecca Cunningham, Rodney A. Hayward, and Rachel Stanley. 2008. "Uninsured Adults Presenting to US Emergency Departments." *JAMA* 300 (16): 1914 – 1924.

Pitts, Stephen R., Emily R. Carrier, Eugene C. Rich, and Arthur L Kellerman. 2010. "Where Americans Get Acute Care: Increasingly, It's Not At Their Doctor's Office." *Health Affairs* 29 (9): 1620-1629.

Pope, Dorothy, Christopher M. B. Fernandes, France Bouthillette, and Jeremy Etherington. 2000. "Frequent Users of the Emergency Department: A Program to Improve Care and Reduce Visits." *Canadian Medical Association Journal,* April 162, 7: *1017 – 1020.*

Rainey, Hal G. 1997. *Understanding and Managing Public Organizations*. San Francisco: Jossey-Bass, Inc.

Rosenbaum, Sara and Peter Shin. 2006. *Health Centers Reauthorization An Overview of Achievements and Challenges*. Kaiser Commission on Medicaid and the Uninsured. Report #7471 (Washington, D.C: March 2006).

Rust, George, Peter Baltrus, Jiali Ye, Elvan Daniels, Alexander Quarshie, Paul Boumbulian, and Harry Strothers. 2009. "Presence of a Community Health Center and Uninsured Emergency Department Visit Rates in Rural Counties." *The Journal of Rural Health* 25: 8-16

Shumway, Martha, Alicia Boccellari, Kathy O'Brien, and Robert L. Okin. 2008. "Cost-Effectiveness of Clinical Case Management for Frequent Users: Results of a Randomized Trial." *The American Journal of Emergency Medicine* 26: 155-164.

Sommers, Benjamin D, Katherine Baicker and Arnold M. Epstein. 2012. "Mortality and Access to Care among Adults after State Medicaid Expansions." *The New England Journal of Medicine* nejm.org: 1-10.

Streeter, Sonya, Shamonda Braithwaite, Narda Ipakchi, and Michael Johnsrud. 2009. "The Effect of Community Health Centers on Healthcare Spending & Utilization." *National Association of Community Health Centers*. September: Avalere Health.

Tang, Ning, John Stein, Renee Y. Hsia, Judith H. Maselli and Ralph Gonzales. 2010. "Trends and Characteristics of US Emergency Department Visits, 1997-2007." *JAMA* 304(6): 664-670.

U.S. Census Bureau. 2011. American Community Survey 1-Year Estimates. http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_11_1YR_S2701&prodType=table last accessed September 26, 2012.

U.S. Government Accountability Office. 2011. *Hospital Emergency Departments: Health Center Strategies That May Help Reduce Their Use*, GAO-11-414R (Washington, D.C: April 11, 2011).

Weber, Ellen J., Jonathan A. Showstack, Kelly A. Hunt, David C. Colby, Barbara Grimes, Peter Bacchetti, and Michael L. Calaham. 2008. "Are the Uninsured Responsible for the Increase in Emergency Department Visits in the United States?" *Annals of Emergency Medicine* 52(2): 108-115.

Weinick, Robin M., Rachel M. Burns and Ateev Mehrotra. 2010. "Many Emergency Department Visits Could Be Managed At Urgent Care Centers and Retail Clinics." *Health Affairs*, 29,9 (September): 1630-1636.

Weiss, Larry D. and Jorge A. Martinez. 1999. "Fixing EMTALA: What's Wrong with the Patient Transfer Act." *Journal of Public Health Policy*, 20,3: 335-347.

Zahradnik, Anne G. 2008. "Does Providing Uninsured Adults with Free or Low-Cost Primary Care Influence Their Use of Hospital Emergency Departments?" *Journal of Health and Human Services Administration,* Fall: 240-258.

Zibulewsky, Joseph. 2001. "The Emergency Medical Treatment and Active Labor Act (EMTALA): What It Is and What It Means For Physicians." *Baylor University Medical Center Proceedings* 14: 339-346.

APPENDIX

VALDOSTA STATE UNIVERSITY
Building for Our Next Century

February 22, 2012

Ms. Kimberly Gray
DPA Program

Dear Ms. Gray:

Thank you for your inquiry regarding the applicability of Institutional Review Board (IRB) review of your proposed capstone project, "Greater Augusta Healthcare Network (GAHN) Study." Because you are not interacting or intervening with any individuals to collect data and because the archival data you will use do not contain identifiers, this project is not considered human subject research as defined in 45 CFR 46 and, therefore, is not subject to IRB oversight.

I wish you best of luck with this project and with completion of your degree program.

Sincerely,

Barbara H. Gray

Barbara H. Gray
IRB Administrator

Office of Sponsored Programs & Research Administration
Location Regional Center for Continuing Education • 903 N. Patterson St. • **Address** 1500 N. Patterson St. • Valdosta, GA 31698-0429
Phone 229.259.5045 • **Fax** 229.245.3853 • **Web** www.valdosta.edu/ospra/