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Trends of Emergency Department Use by Uninsured Individuals for Non-Urgent Health Care Conditions

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Abstract

Roughly one-third of all emergency department (ED) visits by both insured and uninsured individuals in the United States (US) are for non-urgent health conditions that can be effectively treated at a reduced cost by a primary care provider (Hossain, 2011). The purpose of this study is to identify trends of ED visits by uninsured individuals. This study is a secondary data analysis of patient visits to a midwest community ED. This study examined the services provided in the ED for non-urgent visits that could be provided at a less costly and non-urgent care facility, such as a Community Health Care Clinic (CHC), Nurse Managed Health Center (NMHC), or prompt care. Implications of the analysis are discussed, including community resources needed to reduce non-urgent ED visits and the associated cost burdens of uncompensated health care dollars on this midwest community.

Background

The number of Americans without health care insurance is a problem that has been difficult for the nation to address. The US Federal Census Bureau in 2011 states that the number of uninsured Americans in 2010 was 49.9 million individuals, up from 49 million in 2009, and this number is expected to rise again in 2011. In 2010, 16.3% of the US population was without health care insurance, a number that has risen by over three percent in the past decade (Denavas-Walt, Proctor, & Smith, 2011). This does not include the over 13 million Americans that are estimated to be underinsured (Commonwealth Fund, 2006; as cited in Brim, 2008).

The US spent 2.6 trillion dollars on health care in 2010, and this amount is growing annually (Kaiser Family Foundation, 2012). Health care costs are increasing because of the costs of chronic health care problems, especially those that lead to tertiary care. Chronic health care needs are the leading responsibility for this increase in health care costs, accounting for roughly 75% of total annual spending by the US on health care (Centers for Disease Control and Prevention [CDC], 2011). With chronic conditions becoming more common in all populations, especially those that are uninsured, uncompensated care costs in the future may continue to rise.

Those most likely to be uninsured include foreign-born residents who are not US citizens, young adults ages 19 to 25, and low-income families living well below the poverty level (Christie, 2011). Individuals who are uninsured face many barriers that could have effects on their health in the future. Individuals who lack insurance are more likely to report poor to fair health, are less likely to have a regular source of primary care, and are more likely to have ED visits (Begley, 2006; Hadley & Holahan, 2004). The uninsured are more likely to be diagnosed with advanced stages of disease, and they are 30-50% more likely to be hospitalized for a preventable illness (Begley, 2006; Hadley & Holahan, 2004).

The uninsured are not receiving the primary preventive care they need. When they do seek care, the most accessible option is an ED. Hossain (2011) found that one-third of all ED visits (including both insured and uninsured individuals) in the US are for non-urgent conditions that can be effectively treated by a primary care provider. When individuals who are uninsured receive care from an ED and are unable to pay the hospital, government and tax payers are left to compensate the bill (Henderson, 2010). It is estimated that public hospitals provide 34-40 billion dollars of uncompensated care annually (Hadley & Holahan, 2004).

Each day the US lacks a solution for providing quality and affordable health care for uninsured individuals, the nation and its taxpaying citizens pay the cost. One solution that can help lessen this problem is the utilization of non-urgent care facilities such as community health care clinics (CHCs), nurse managed health centers (NMHCs), or prompt care facilities.

Non-Urgent Care Facilities

CHCs are "private nonprofit or public organizations that provide primary health care in medically underserved areas throughout the United States and its territories" (Carlson, 2001, p. 47). These centers are used specifically to serve individuals who are not receiving the primary preventive care they need. CHCs are usually funded through grants and donations from private organizations. A CHC can be managed by a team of physicians, advanced practice nurse, or other health care provider, and collaborations among providers are commonly seen.

CHCs focus on providing care for the community and strengthening health in the community. Eden, Carlson, and O'Connor (1997) found that one in three CHC users was uninsured, and this ratio has been expected to grow as the nation's uninsured population continues to rise (as cited in Carlson, 2001). CHCs offer primary preventive care to help maintain uninsured patients' health and wellness and aid in reducing the risks that chronic health

conditions place on them. A study by Fertig, Corso, and Balasubramaniam in 2012 found that the average cost savings to a hospital by having a free clinic (CHC or NMHC) that addressed non-urgent health care needs (such as those that have an acuity rating of levels 1-3 in this study) was $170 per visit. Uncompensated care from a hospital costs the nation more money over time than uncompensated care from a CHC or NMHC, and the utilization of facilities such as these will save money in the long term (Hadley & Holahan, 2004).

NMHCs serve a similar population as CHCs. They focus on primary care, but also on building a trusting relationship between the nurse and the patient to aid in health care education and patient autonomy (Agbisit, 2007). NMHCs are managed by an advanced practice nurse and are more likely to receive federal funding than a CHC. NMHCs, like CHCs, offer low-cost health care; the cost for a visit to a NMHC is often two to three times less than a visit to an ED for the same non-urgent health care problem (Thompson, 1999). After opening a NMHC, one community reduced ED visits, and decreased 911 calls by 30%, which resulted in a savings of over $16,000 annually for the community (Coddington & Sands, 2008). Compared to other providers, NMHC patients have lower rates of hospitalizations, which decreases hospital budget deficits derived from providing uncompensated care to uninsured individuals (Hansen-Turton, Bailey, Torres et al., 2010).

Urgent care centers, or prompt cares, as referred to in this paper, are the fastest growing segment of health care in the US (National Association for Ambulatory Care, 2012). Prompt care centers are health care facilities that have more expansive services as compared to retail clinics. They also help reserve EDs for patients who have more serious, life-threatening health care conditions by caring for minor acute care conditions (Urgent Care Association of America, 2011). Like CHCs and NMHCs, prompt cares aid in diverting non-urgent visits from the ED to a

more accessible and appropriate facility. Unlike CHCs and NMHCs, prompt care centers are not intended to be a primary care provider for patients, but rather a facility that cares for acute situations when they arise. Weinick & Betancourt published *No appointment needed: The resurgence of urgent care centers in the United States* (2007), which focused on the importance of prompt care centers in the US. This publication noted a 2005 study by Health Partners that stated a visit to a prompt care center roughly costs $130, compared to $328 for an ED visit for the same condition. Prompt care centers, like CHCs and NMHCs, have the potential to help reduce uncompensated care costs, as well as offer patients a more accessible health care option.

Access to affordable health care through a CHC or alternative non-urgent care facility may reduce non-urgent visits to EDs (Rust, 2009). A study by Smith-Campbell (2005) showed that within three years of establishing a CHC, uninsured visits to the local hospital ED decreased by almost 40%, while insured ED visits continued to grow. Hadley and Holahan (2004) state that uninsured individuals receive less preventive and primary care, are diagnosed with more advance stages of chronic health care conditions, and have higher mortality rates than insured individuals do. CHCs, NMHCs, and prompt cares have the opportunity to help reduce the burden of uncompensated care on the US and have the chance to provide affordable and quality health care to individuals who are unable to receive it through their own resources.

ED Use by Insured and Uninsured Patients

While there is a focus and need on providing affordable and accessible care to uninsured individuals, previous literature has found that insured patients were the cause of increased use of the ED. Weber et al. stated in a 2008 study that uninsured visits to the ED remained stable throughout an eight year period; while throughout the same time frame, insured visits to the ED steadily increased. Their study found that individuals who have a primary care provider and a

usual source of care were the individuals who were responsible for the increase in ED use. Peter Cunningham, a quantitative researcher also agreed with Weber et al. (2008) in his testimony to the US Senate in 2011. He stated that the insured population is responsible for the increased use of the ED, not the uninsured population. His testimony states that from 1995-2008 the use of EDs in the US by privately insured individuals increased from 37% of all visits to 42% of all ED visits. While the privately insured population's use of ED visits increased, the uninsured visit rate of use fell by 2%. At the same time, the amount of uninsured individuals in the U.S. increased by 23%. Cunningham estimates that the privately insured individuals were responsible for 60% of the overall increase in use of the ED, while the uninsured population accounted for only 9% of the increase.

Purpose

The purpose of this study is to identify trends of ED visits by uninsured and insured individuals from mid 2004 to the beginning of 2012. Diagnoses commonly seen in the ED that could be appropriately outsourced to a CHC, NMHC, or prompt care were also investigated. Community resources that could reduce non-urgent visits and cost burdens on this midwest community ED are investigated.

Research Questions

The following research questions guided the study:

1. What characteristics are similar and different between insured and uninsured patients?
2. Are uninsured patients using the ED at a higher rate than insured patients? How has the use of the ED changed over time?
3. What health conditions account for non-urgent visits to the ED?
4. What services or resources are needed in the community to reduce non-urgent ED visits?

Method

Study Design

This is a nonexperimental, retrospective, correlational, secondary data analysis of patient visits to a midwest community ED between mid 2004 and the beginning of 2012.

Data

The data set included 151,241 adult visits to a midwest ED. It was narrowed to 84,877 visits to reflect only non-urgent visits. Incomplete data were present throughout the data set, including several variables with missing values. The total population was comprised of patients presenting with a variety of health conditions. To ensure a sample that adequately represents CHC, NMHC, or prompt care patients, the following inclusion and exclusion criteria were used.

Inclusion Criteria:

- All patients ages 18 and above
- Patients who presented to the ED with and received an acuity level of 1, 2, or 3, as assigned by ED staff, representing a non-urgent visit

Exclusion Criteria:

- Any patient presenting to the ED with an acuity level of 4 or 5, as assigned by ED staff
- Patients who, after discharge from the ED, were admitted to an inpatient floor, observation floor, or another inpatient type of health care facility
- Any patient who died in the ED
- Any patient who left the ED before being seen by a physician or receiving a diagnosis

Procedure

Institutional Review Board (IRB) approval was granted for this project by the researchers' affiliated university, as well as the partnering hospital's IRB. No informed consent was required as the patient data set was retrospective and did not include identifying information. There were no incentives offered to the hospital who participated in this study and no consequences for refusal to participate. Researchers agreed to provide the participating hospital with the final research report for their organization's records.

A secondary data set was received from information technology services at the participating hospital institution. The data set was maintained on password protected computers and flash drives. The data set included multiple variables of patient visits. Researchers organized the data set, and equivalent terms were changed for consistency throughout the data set. Exclusion criteria were applied to 151,241 patient cases to leave a non-urgent population of 84,877 patient visits that met inclusion criteria.

Statistical Analysis

SPSS 18.0 was used for all statistical analysis. Frequencies were run for multiple patient variables of the total population and the non-urgent population; for a complete listing of patient variables in the data set, refer to Table 1. The total population and the non-urgent population were categorized into insured patients and uninsured patients and cross tabulations were run to determine the effect insurance status has on other patient variables. Pearson's Chi Squares were used to determine the significance of this relationship. Means were calculated for appropriate variables as a measure of central tendency to describe a certain characteristic of a variable of different population groups. Independent t-tests were used with these variables to determine the significance of any differences between means of insured and uninsured groups.

Results

Demographics

Frequencies were used to determine patient demographic data of all patient visits in this study; for total population demographics refer to Tables 2-7. The total population was 58.7% female and 41.3% male. Of the total population, 76.4% were between the ages of 18-60, which the mean age for males was 40.4 years and females was 39.6 years. The mean age of insured patients in this population was 47.8 years, and the mean age for the uninsured patients in this population was 34.5 years. An independent t-test confirmed that insured patients' mean age and uninsured patients' mean age were significantly different ($t=142.4$, $df=70,261$, $p<0.0005$). The majority of the total population was Caucasian or White at 81.2%, followed by 13.5% African American or Black individuals, and the remaining 5.3% of the population included many different race groups. Of the patients in the total population, 29.8% received care through a managed care system, 45.9% received care through Medicare/Medicaid, 18.1% were considered uninsured or charity cases, and 6.3% were commercial payers. Therefore, 18.1% of the total population was uninsured and the remaining 81.9% were insured. The majority of the total population (70.7%) stated they had a primary care provider.

The non-urgent population had similarities and differences as compared to the total population. The female population was slightly higher at 59.4%, males making up 40.6% of the population. Of the non-urgent population 61.4% were between the ages of 18-60. The mean age for males was 40.4 years, the mean age for females 39.6 years. The mean age of insured patients in the non-urgent population was 41.8 years, where the uninsured patients' mean age was 33.3 years. An independent t-test validated that insured patients' mean age and uninsured patients' mean age were significantly different ($t=76.76$, $df=50,230$, $p<0.005$). The majority of the non-

urgent population was Caucasian or White at 77.9%, followed by African American or Black individuals at 16.2%, and the remaining 5.9% was a mix of different races. The non-urgent population had a higher percentage of African American or Black individuals than the total population. Of the patients in the non-urgent population, 28.3% had insurance through a managed care system, 41.7% had Medicare/Medicaid, 22.1% were uninsured, and 7.9% were commercial payers. There was a higher rate of uninsured individuals in the non-urgent population than in the total population. The majority did have primary care providers (65.3%), but this percentage is lower compared to the total population's primary care provider percentage of 70.7%.

Comparing Insured and Uninsured Populations

Chi Squared (χ^2) was calculated for each cross tabulation of the non-urgent population. Insurance status was significantly related to acuity level, year visit took place, sex, race, overall age, day of visit to the ED, and whether the patient had a primary care provider. All relationships had a significance level below 0.0005. For results regarding χ^2 refer to Table 8.

The following discussion of cross tabulations focuses on the non-urgent population. Tables were created for the total population as a means of comparison to the non-urgent population. The total population will not be discussed here, as the primary investigation for this study focuses on the non-urgent patients. For a representation of the effect insurance status had on other patient variables of the non-urgent population, refer to Tables 9-14.

Of the non-urgent population, insured patients were 63.5% female and 36.5% male, compared to the uninsured group being more evenly distributed with females making up 44.8% of uninsured patients and males making up 55.2%. Ages of the insured population were 63.1% between the ages of 25-60, whereas the uninsured population had 60.7% between the ages of 18-

34. Race breakdowns were slightly different with 80.4% of the insured group being Caucasian or White, 14.7% African American or Black, and 4.9% other races. The uninsured group was slightly more diverse with 69.2% Caucasian or White, 21.7% African American or Black, and 9.1% other races. Patients in the insured group had a slightly lower rate of primary care providers at 72.6%; the uninsured group's primary care provider rate was lower, at 39.4%.

Variables of particular interest included the time of the day and day of the week when visits occurred for uninsured and insured patients (Tables 15-16). Insured patients in the non-urgent population visited most often from 12am-3am (22.5%) and from 9am-6pm (57.7%). The uninsured patients in the non-urgent population frequently visited from 12am-3am (20.9%) and 9am-6pm (48.8%). Insured patients of the non-urgent population visited most often on Sundays at 14.8%, with visits on other days at almost the same rate ranging from 13.7%-14.8%. The uninsured group of the non-urgent population visited most frequently on Mondays at 15.6%, and the other days of the week were visited at close to the same rate at 14.0%-15.6%.

Because of economic fluctuation over the past decade, cross tabulations were run to investigate the percentage of total visits by insured and uninsured patients in each year (Table 17). Of the non-urgent population, insured patients visited the ED most often during 2008 at 11,496 visits in that year. The insured group of the non-urgent population visits increased from 2005 to peak in 2008 and then steadily decreased to 9,864 visits in 2011. The uninsured group of the non-urgent population visited most often in 2009 with 3,091 visits. The visits for the uninsured group of the non-urgent population fluctuate more than the other groups from year to year, from 2009 to 2010 visits decreased by 6% while from 2007 to 2008 visits increased by 28%.

Another topic investigated was the mean acuity level of patient health care conditions. Mean acuities were calculated for each group's ED visits; refer to Tables 18-20. The insured group of the non-urgent population had a mean acuity for patient conditions at 2.65. Patients in the uninsured group of the non-urgent population had a lower mean acuity at 2.54. An independent t-test stated that insured patients' mean acuity level and uninsured patients' mean acuity level were significantly different ($t=17.699$, $df=27{,}626$, $p<0.0005$).

The top ten health care condition categories for both the insured and uninsured groups of the non-urgent population are listed in Tables 21 and 22. Both groups had the same top three reasons why patients visited the ED. The category of general symptoms (of the cardiovascular, urinary, digestive and abdominal, respiratory, skin, head and neck, and nervous and musculoskeletal systems) was the highest ranked reason for ED visits. Diseases of the musculoskeletal and connective tissues ranked second, and sprains of joints and muscles ranked third. These three categories alone made up over 30% of total visits for each group. For the insured group of the non-urgent population, open wounds was the fourth ranked health care condition category. Of the uninsured group of the non-urgent population, diseases of the oral cavity, salivary glands, and jaw was ranked fourth at 7.0% of visits.

Discussion

Trends of ED Use

Trends of ED use by uninsured patients provide information regarding the importance of primary care for these individuals. Uninsured individuals came in with a higher number of minor health care conditions rated at an acuity level of 1 or 2 more frequently than insured individuals. Patients who were uninsured typically visited EDs Mondays through Fridays between the hours of 9am and 6pm, which are roughly the hours the free CHC and prompt care are open in the

midwest community from which the data were derived. This finding suggests that a CHC, prompt care, or, if available, a NMHC can be used to help divert acuity level 1, 2, and 3 health care conditions from the ED, which will aid in reducing ED patient load as well as provide care at a lower cost to uninsured individuals.

In the past, the CHC in this community had to limit or refuse new patients due to the high volume of need. In 2008, when the economic recession began in the US, the CHC in the community saw a 30% increase in monthly prospective patient applications received (Swiech, 2008). With a sudden increase in patient applications, the CHC was unable to take new patients into the clinic. At the same time, ED visits by uninsured individuals increased reflecting the need for more resources in the community. From 2008 to 2009, the uninsured total population and non-urgent population both saw an increase in annual visits. With increased funding and number of providers, the alternative non-urgent care options have the potential to continue to reduce the number of uninsured patient visits in the EDs for non-urgent health care conditions. Expanding the resources currently available would enable a CHC, NMHC, or prompt care to reach a greater number of people who need access to affordable primary and preventive care.

Decreasing Costs through Use of Non-Urgent Care Options

The aspect of what cost savings a CHC, NMHC, or prompt care can provide was an initial question for this project. Unfortunately, cost was one of the areas of missing data, and this question was not directly addressed during the time period of this study. If the Fertig, Corso, and Balasubramaniam (2012) average cost savings of $170 per visit was applied to the 84,877 non-urgent patient visits in this study, the hospital would have saved $14,429,090 over seven years, roughly saving two million dollars annually. For non-urgent visits for acute health care situations prompt care centers are an appropriate care facility for patients instead of the ED. In Weinick &

Betancourt's 2007 study that referenced a 2005 study by Health Partners, a visit to a prompt care would cost $130. If the average of $130 per visit was applied to the 84,877 non-urgent visits in this study it would amount to a savings of $11,034,010 over seven years, roughly saving a hospital over 1.5 million dollars annually.

Care provided by a CHC or NMHC saves hospitals costs up front, but also provides a primary care outlet to patients that would not otherwise have had access to primary and preventive care. Uninsured patients receiving primary and preventive care at present will save hospitals money in the future by reducing the amount of tertiary care that would potentially be needed. Lack of prevention of chronic health care conditions, as well as of lack treatment and disease management for many years, will lead to serious tertiary health care conditions that require hospitalization. Like ED visits of uninsured patients, acute care visits to an inpatient floor are likely to be uncompensated care. Use of funding to care for these patients depletes monetary resources that could otherwise be used for projects that could benefit the entire community. By increasing funding to CHCs for primary and preventive care of uninsured individuals, a community is offering uninsured patients the opportunity for better health. In addition, all citizens have the opportunity for more health care resources by decreasing the uncompensated care costs of hospitals.

Frequent Non-Urgent Health Care Conditions

A wide variety of health care conditions were included in acuity level 1, 2, and 3 health care conditions for both insured and uninsured individuals. The number one reason why uninsured patients in the total population and the non-urgent population in this sample visited the ED was for symptoms of the cardiovascular, urinary, digestive and abdominal, respiratory, skin, head and neck, and nervous and musculoskeletal systems. Symptoms involved in this category

include nausea, vomiting, syncope, sleep disorders, dizziness, vertigo, abnormal gait, rashes, cyanosis, edema, tachycardia, dyspnea, cough, shortness of breath, heartburn, bloating, dysuria, urinary retention, incontinence, and pain among others. Many of these symptoms can be treated with a visit to an advanced practice nurse or general physician at a CHC, NMHC, prompt care, or through a primary care provider. The CHC, in the midwest community where this study took place, has services available for chronic health care conditions, medications, primary care visits, and diagnostic laboratory work. An advanced practice nurse or physician could perform an assessment and order laboratory tests on a patient and determine the cause of the problem. If the reason for the visit is non-urgent, the care provider can treat the problem, and allow the patient to leave the clinic cared for with little to no health care bill. If the aggravating health care problem, on assessment, seems to be an emergency, the care provider can refer to the patient to the ED to receive the timely care they need to treat the patient's specific problem. Redirecting patient visits that seem non-urgent to a CHC, NMHC, or prompt care will allow the ED to have all resources available for patients who have health care problems that are urgent and serious.

The uninsured population in this study had a significantly lower percentage of patients that had a primary care provider. Many patients come to the ED for health care problems that can be addressed by a primary care provider (Hossain, 2011). Because they do not have a primary care provider, they treat the ED as one, where it costs significantly more to see a provider for the same care a patient could receive at an office or clinic (Hadley & Holahan, 2004). The lack of primary care throughout life can have detrimental effects on overall health. CHCs and NMHCs provide a way for uninsured individuals to receive excellent primary care at little to no cost. If more CHCs, NMHCs, or prompt cares were available, with a wide variety of services, there could be an increase in the overall quality of health of a community.

Insured vs. Uninsured: Who Uses the ED at a Higher Rate?

One of the research questions addressed is if uninsured patients used the ED at a higher rate than insured patients. This question was hypothesized to determine if the results found were consistent with those of Weber et al. (2008), who found that insured individuals were the reason for the increase in ED visits in the US. The results from the present study show that insured patients have actually decreased the total annual number of visits from 2005 to 2011, and that uninsured visits have increased roughly 63%. Investigating uninsured visits in 2011 that are considered non-urgent have increased by over 73% since 2005.

Previous studies suggest that uninsured individuals are not the root cause of increased ED visits. However, these studies analyzed data from the early 2000s. While it is possible that the trend in this community is different than the national trend, many factors that affect health care have changed significantly within the past five years. Many factors could be responsible for the increased number of total annual visits by uninsured individuals seen in this study. In this study, the economic downfall of the US appears significant. Uninsured visits have been at higher rates since the 2008 economic crash. With limited resources available within the community through the CHC and the health department, the ED is the next choice for many individuals when it comes to receiving care. The CHC in the midwest community in which the study was conducted stated that many patients left the CHC in the early to mid 2000s due to obtaining insurance through their employer. When the economic crash occurred, people lost jobs and insurance or took significant pay cuts. This made them unable to access the health care they needed and many returned to the CHC, putting a hold on applications for new patients.

Resources Needed in the Community

The type of health care individuals receive throughout their lives has an effect on their future health. Currently, the community has inadequate health care options for individuals who are uninsured and lack the resources available to receive adequate care. By expanding the services and resources available at CHCs, NMHCs, and prompt cares, uninsured patients will have the opportunity to receive primary and preventive care without large uncompensated care costs on hospitals and the community. For a change to occur, more resources need to be obtained for services that are not currently being provided at CHCs, NMHCs, prompt cares, or health departments. One such service is dental care, frequently a cause of ED visits by uninsured individuals.

The midwest community in which data was obtained does not have any regular dental care services for uninsured adults other than extraction at the local health department. Several organizations hold one day clinics periodically, but these clinics are not always available when needed by patients. The CHC is unable to provide routine dental care as well. Dental problems were ranked as the fourth highest reason for uninsured visits to the ED for non-urgent health care problems. With no access to dental care at an affordable cost, the ED is the only option for uninsured individuals. The services provided for dental care at the ED are minimal. Dental care is very important to overall health and is frequently an aspect of health care that is neglected (US Department of Health and Human Services, 2000). The mouth breeds bacteria and serves as portal of entry for other harmful diseases. The Surgeon General's Report, *Oral Health in America*, describes the mouth as the "mirror for the rest of the body (p. 97)." The mouth shows physical ailments as well as the overall health of a patient.

Oral health has long been a part of the Healthy People initiative and is included in long-term planning for many midwest communities as a service that needs to be increased, especially for low income individuals. It is necessary that affordable dental care becomes an option at CHCs, NMHCs, or prompt cares for patients who are uninsured, because it will have an effect on their future health. By taking a primary preventive approach and expanding the amount of primary care and health care resources offered to patients, people will live healthier lives and health care costs may begin to decrease.

Limitations

The current study analyzed data from only one midwest ED. It is unclear whether the results from this study are consistent with the results that would be received from other communities throughout the country. The sample size for this study was adequate for analyzing aspects of patient care and had an adequate representation of males and females across all age groups. However, some races were not adequately represented, including Hispanic, Asian, and multiracial individuals. This inadequate representation of race may affect the generalizability of this study to other geographic areas and populations. The retrospective design used in this study is also a limitation. The data analyzed are only as accurate as entered into the system, and certain patient variables were missing substantial amounts of data. One such variable was the costs of and the actual procedures provided in the ED. Due to missing data, the study could not evaluate the cost effectiveness of using a CHC instead of the ED's services. If hospitals want an accurate portrayal of the money they are losing due to uncompensated health care costs in the ED, more attention to data entry is needed. The exclusion criteria used may also be a limitation, as patient visits that were excluded may have been inappropriate users of the ED.

Clinical Implications

CHCs and NMHCs are appropriate alternative primary care providers for individuals who are uninsured. In addition, prompt care centers are an appropriate alternative for acute health care conditions of uninsured and insured individuals as well. Whether used to treat a current, acute health care condition or to manage chronic health care conditions, CHCs, NMHCs, and prompt cares provide excellent quality and low cost care. With the current economic situation in the US, many individuals are in need of a primary care provider that fits their budget and their needs. If uninsured visits to the ED for non-urgent health care conditions are to decrease in the future, new options for care and resources need to become available for these individuals. CHCs, NMHCs, and prompt cares are a desirable alternative.

The investigation of the top reasons uninsured individuals visit the ED is another factor that needs to be addressed clinically. General symptoms of body systems can appropriately be cared for by a physician or an advanced practice nurse. Musculoskeletal and connective tissue diseases and conditions can be cared for by a physician or an advanced practice nurse as well as a care provider in the orthopedic field. Sprains of joints and muscles can also be cared for by an orthopedic care provider. Most importantly, dental hygiene is a serious problem and ranked as the fourth leading cause of non-urgent visits to the ED by uninsured individuals in this study. Other research demonstrates the importance of accessible and affordable dental care to uninsured individuals (Anderson, Cherala, Traore & Martin, 2011; Hong et al., 2011).

For ED visits for non-urgent health care conditions to decrease, changes in care must be made. These changes will decrease the negative financial effects on hospital EDs from uncompensated care. These changes will increase the health and well being of the uninsured population that typically lacks effective and consistent health care (Brim, 2008; Carlson, 2001).

Communities putting more time, money, and effort into CHCs, NMHCs, and prompt cares will eventually benefit the community members at large through more resources becoming available for the entire population. They will create a healthier population as well. CHCs and NMHCs can make a difference in their communities, by making primary care services available to those who need them most.

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Table 1

Patient Variables Included in the Data Set

Patient Variables
Day of Arrival
Arrival Date
Arrival Time
Length of Stay in ED
Mode of Arrival
Payer Source
Sex
Age
Zip Code
Race
Primary Language
ED Discharge Destination
Acuity Level 1-5
Diagnosis Code and Name
Procedures Received
Primary Care Provider
Any Procedure Charges
Type of Patient after ED Discharge
If a Referral was made
Specialty of Referral

Table 2

Demographics for Total Population: Sex

Sex	Frequency	Percent
Female	88832	58.7
Male	62401	41.3
Total	151233	100.0

Table 3

Demographics for Total Population: Age

Age Range	Frequency	Percent
18-24	25071	16.6
25-34	32401	21.4
35-44	25332	16.7
45-60	32808	21.7
61-75	17981	11.9
76-85	11419	7.6
86-105	6229	4.1
Total	151241	100.0

Table 4

Demographics for Total Population: Race

Race	Frequency	Percent
American Indian or Alaskan Native	116	0.1
Asian	591	0.4
Black or African American	20458	13.5
Hispanic	3293	2.2
Multiracial	47	0.0
Other	3761	2.5
Unknown	102	0.1
White	122856	81.2
Total	151224	100.0

Note. 17 patients in the total population did not have race data entered and are considered missing values.

Table 5

Demographics for Total Population: Payer

Payer Type	Frequency	Percent
Commercial	9534	6.3
Managed Cared	45024	29.8
Medicaid	29891	19.8
Medicare	39399	26.1
Self Pay/ Charity	27362	18.1
Total	151210	100.0

Note. 31 patients in the total population did not have payer data entered and are considered missing values.

Table 6

Demographics for Total Population: Insurance Status

Insurance Status	Frequency	Percent
Uninsured	27362	18.1
Insured	123848	81.9
Total	151210	100.0

Note. 31 patients in the total population did not have insurance status data entered and are considered missing values.

Table 7

Demographics for Total Population: Primary Care Provider (PCP)

PCP	Frequency	Percent
Yes	106986	70.7
No	44255	29.3
Total	151241	100.0

Table 8

Chi Squared Significance of Insurance Status on Patient Variables in the Non-Urgent Population

	Acuity Level	Sex	Race	Overall Age	Day of Arrival	Year Visit Took Place	PCP
Pearson Chi-Square Value	372.632	2124.043	1502.478	4619.014	51.345	187.994	7073.768
Likelihood Ratio	354.406	2092.395	1351.457	6260.130	54.067	166.012	6793.866
Degrees of Freedom	4	4	14	174	12	16	2
Significance (p value)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Number of Valid Cases	84877	84877	84877	84877	84877	84877	84877

Note. $p<0.05$ is considered significant.

Table 9

Insured vs. Uninsured Total Population vs. Non-Urgent Population: Sex

Sex of Total Population	Insured		Uninsured	
	N	%	n	%
Female	76402	61.7	12411	45.4
Male	4744	38.3	14945	54.6
Total	123848	100.0	27362	100.0

Sex of Non-Urgent Population	Insured		Uninsured	
	n	%	n	%
Female	42005	63.5	8386	44.8
Male	24126	36.5	10339	55.2
Total	66132	100.0	18726	100.0

Note. 31 patients in the total population did not have data entered to correlate the insurance status with gender and are considered missing values. 19 patients in the non-urgent population did not have data entered to correlate insurance status with gender and are considered missing values.

Table 10

Insured vs. Uninsured Total Population vs. Non-Urgent Population: Age

Age of Total Population	Insured		Uninsured	
	N	%	n	%
18-24	18059	14.6	7008	25.6
25-34	24008	19.4	8385	30.6
35-44	19605	15.8	5724	20.9
45-60	27110	21.9	5683	20.8
61-75	17472	14.1	508	1.9
76-85	11378	9.2	41	0.1
85-105	6216	5.0	13	0.0
Total	123848	100.0	27362	100.0
Mean Age	47.85 years		34.50 years	

Age of Non-Urgent Population	Insured		Uninsured	
	n	%	n	%
18-24	12962	19.6	5237	28.0
25-34	16366	24.7	6124	32.7
35-44	11897	18.0	3695	19.7
45-60	13473	20.4	3406	18.2
61-75	6409	9.7	251	1.3
76-85	3377	5.1	12	0.1
85-105	1648	2.5	1	0.0
Total	66132	100.0	18726	100.0
Mean Age	41.81 years		33.31 years	

Note. 31 patients in the total population did not have data entered to correlate the insurance status with age and are considered missing values. 19 patients in the non-urgent population did not have data entered to correlate insurance status with age and are considered missing values.

Table 11

Independent t-test of Mean Age and Insurance Status of Total Population

t-test of Mean Age and Insurance Status	t	Degrees of freedom	p	Mean Difference	Standard Error Difference
Equal Variances Not Assumed	142.412	70261.466	<0.0005	13.34919	0.09374

Note. p<0.05 is considered significant.

Table 12

Independent t-test of Mean Age and Insurance Status of Non-Urgent Population

t-test of Mean Age and Insurance Status	t	Degrees of freedom	p	Mean Difference	Standard Error Difference
Equal Variances Not Assumed	76.76	50230.694	<0.0005	8.49278	0.11064

Note. p<0.05 is considered significant.

Table 13

Insured vs. Uninsured Total Population vs. Non-Urgent Population: Race

Race of Total Population	Insured		Uninsured	
	n	%	n	%
American Indian or Alaskan Native	100	0.1	16	0.1
Asian	516	0.4	74	0.3
Black or African American	14870	12.0	5586	20.4
Hispanic	1787	1.4	1506	5.5
Multiracial	30	0.0	17	0.1
Other	2804	2.3	955	3.5
Unknown	82	0.1	20	0.1
White	103659	83.7	19171	70.1
Total	123848	100.0	27362	100.0

Race of Non-Urgent Population	Insured		Uninsured	
	n	%	n	%
American Indian or Alaskan Native	61	0.1	10	0.1
Asian	294	0.4	46	0.2
Black or African American	9696	14.7	4060	21.7
Hispanic	1160	1.8	1020	5.4
Multiracial	19	0.0	11	0.1
Other	1713	2.6	610	3.3
Unknown	37	0.1	12	0.1
White	53152	80.4	12957	69.2
Total	66132	100.0	18726	100.0

Note. 31 patients in the total population did not have data entered to correlate the insurance status with race and are considered missing values. 19 patients in the non-urgent population did not have data entered to correlate insurance status with race and are considered missing values.

Table 14

Insured vs. Uninsured Total Population vs. Non-Urgent Population: Primary Care Provider (PCP)

PCP of Total Population	Insured		Uninsured	
	N	%	n	%
Yes	95598	77.2	11368	41.5
No	28250	22.8	15994	58.5
Total	123848	100.0	27362	100.0

PCP of Non-Urgent Population	Insured		Uninsured	
	n	%	N	%
Yes	47993	72.6	7382	39.4
No	18139	27.4	11344	60.6
Total	66132	100.0	18726	100.0

Note. 31 patients in the total population did not have data entered to correlate the insurance status with primary care provider status and are considered missing values. 19 patients in the non-urgent population did not have data entered to correlate insurance status with primary care provider status and are considered missing values.

Table 15

Insured vs. Uninsured Total Population vs. Non-Urgent Population: Time of Day Care Used

Time of Arrival for Care Used by Total Population	Insured		Uninsured	
	N	%	n	%
0001-0300	18659	20.5	3167	15.7
0301-0600	3818	4.2	833	4.1
0601-0900	8578	9.4	1977	9.8
0901-1200	12852	14.1	3205	15.9
1201-1500	13386	14.7	3225	16.0
1501-1800	13975	15.3	3254	16.2
1801-2100	13554	14.9	2983	14.8
2101-2400	6265	6.9	1478	7.3
Total	91087	100.0	20122	100.0

Time of Arrival for Care Used by Non-Urgent Population	Insured		Uninsured	
	n	%	n	%
0001-0300	10572	22.5	2084	20.9
0301-0600	1789	3.8	530	3.9
0601-0900	4430	9.4	1370	10.1
0901-1200	6560	14.0	2230	16.4
1201-1500	6436	13.7	2210	16.2
1501-1800	6755	14.4	2205	16.2
1801-2100	7339	15.6	2028	14.9
2101-2359	3111	6.6	955	7.0
Total	46922	100.0	13612	100.0

Note. 40,032 patients in the total population did not have data entered to correlate the insurance status with time of arrival and are considered missing values. 24,343 patients in the non-urgent population did not have data entered to correlate insurance status with gender and are considered missing values.

Table 16

Insured vs. Uninsured Total Population vs. Non-Urgent Population: Day of Visit

Day of Visit by Total Population	Insured		Uninsured	
	n	%	n	%
Sunday	17679	14.3	3835	14.0
Monday	18718	15.1	4194	15.3
Tuesday	17798	14.4	4024	14.7
Wednesday	17569	14.2	3819	14.0
Thursday	17117	13.8	3896	14.2
Friday	17272	13.9	3864	14.1
Saturday	17695	14.3	3730	13.6
Total	123848	100.0	27362	100.0

Day of Visit by Non-Urgent Population	Insured		Uninsured	
	n	%	N	%
Sunday	9789	14.8	2630	14.0
Monday	9584	14.5	2922	15.6
Tuesday	9051	13.7	2714	14.5
Wednesday	9474	14.3	2639	14.1
Thursday	9208	13.9	2676	14.3
Friday	9287	14.0	2652	14.2
Saturday	9739	14.7	2630	14.0
Total	66132	100.0	18726	100.0

Note. 31 patients in the total population did not have data entered to correlate the insurance status with day care received and are considered missing values. 19 patients in the non-urgent population did not have data entered to correlate insurance status with day care received and are considered missing values.

Table 17

Insured vs. Uninsured Total Population vs. Non-Urgent Population: Year of Visit

Yearly Visits of Total Population	Insured		Uninsured	
	N	%	n	%
2004 (Sept-Dec)	3382	2.7	589	2.2
2005	14305	11.6	2709	9.9
2006	15315	12.4	3075	11.2
2007	15882	12.8	3547	13.0
2008	17109	13.8	3796	13.9
2009	17359	14.0	4386	16.0
2010	19078	15.4	4455	16.3
2011	19719	15.9	4437	16.2
2012 (Jan)	1699	1.4	368	1.3
Total	123848	100.0	27362	100.0

Yearly Visits of Non-Urgent Population	Insured		Uninsured	
	n	%	n	%
2004 (Sept-Dec)	1836	2.8	442	2.7
2005	6928	10.5	1770	9.5
2006	7065	10.7	1871	10.0
2007	8558	12.9	2324	12.4
2008	11496	17.4	2993	16.0
2009	9749	14.7	3091	16.5
2010	9913	15.0	2931	15.7
2011	9864	14.9	3069	16.4
2012 (Jan)	723	1.1	235	1.3
Total	66132	100.0	18726	100.0

Note. 31 patients in the total population did not have data entered to correlate the insurance status with year care was received and are considered missing values. 19 patients in the non-urgent population did not have data entered to correlate insurance status with year care was received and are considered missing values.

Table 18

Insured vs. Uninsured Total Population vs. Non-Urgent Population Level of Acuity and Mean Acuity

Level of Acuity of Total Population	Insured		Uninsured	
	n	%	n	%
Level 1	7440	6.1	3057	11.7
Level 2	8504	7.0	2556	9.8
Level 3	52771	43.5	13447	51.3
Level 4	42765	35.3	6227	23.8
Level 5	9802	8.1	927	3.5
Total	121282	100.0	26214	100.0
Mean Acuity	3.32		2.98	

Level of Acuity of Non-Urgent Population	Insured		Uninsured	
	n	%	N	%
Level 1	7323	11.1	3005	16.0
Level 2	8402	12.7	2537	13.5
Level 3	50407	76.2	13184	70.4
Total	66132	100.0	18726	100.0
Mean Acuity	2.65		2.54	

Table 19

Independent t-test of Mean Acuity and Insurance Status for Total Population

t-test of Mean Acuity and Insurance Status	t	Degrees of freedom	p	Mean Difference	Standard Error Difference
Equal Variances Not Assumed	52.278	37639.76	<0.0005	0.34391	0.00658

Note. p<0.05 is considered significant.

Table 20

Independent t-test of Mean Acuity and Insurance Status for Non-Urgent Population

t-test of Mean Acuity and Insurance Status	t	Degrees of freedom	p	Mean Difference	Standard Error Difference
Equal Variances Not Assumed	17.699	27626.037	<0.0005	0.10791	0.00610

Note. p<0.05 is considered significant.

Table 21

Insured vs. Uninsured Total Population: Categories of Health Care Conditions

Top 10 Categories of Illnesses or Diseases that were ED visits for Insured Group of the Total Population	Number and Percentage of Cases within the Group	
	n	%
General Symptoms of the cardiovascular, urinary, digestive and abdominal, respiratory, skin, head and neck, and nervous and musculoskeletal systems	23366	19.1
Diseases of the musculoskeletal system and connective tissues	9231	7.6
Sprains of joints and muscles	6675	5.5
Open wounds	5345	4.4
Contusions and crushing injuries	5053	4.1
Diseases of the Urinary System	4643	3.8
Acute Respiratory Infections	4076	3.3
Fractures	3849	3.2
Chronic Obstructive Pulmonary Disorders and allied conditions	3747	3.1
Complications of pregnancy, childbirth, and the puerperium	3647	3.0
Total	69632	57.1

Top 10 Categories of Illnesses or Diseases that were ED visits for Uninsured Group of the Total Population	Number and Percentage of Cases within the Group	
	n	%
General Symptoms of the cardiovascular, urinary, digestive and abdominal, respiratory, skin, head and neck, and nervous and musculoskeletal systems	4286	16.1
Diseases of the musculoskeletal system and connective tissues	2416	9.1
Sprains of joints and muscles	1887	7.1
Acute Respiratory Infections	1384	5.2
Diseases of the oral cavity, salivary glands, and jaw	1364	5.1
Diseases of the skin and subcutaneous tissue	1270	4.8
Contusions and crushing injuries	1243	4.7
Neurotic disorders, personality disorders, and other nonpsychotic mental disorders	1181	4.4
Open wounds	1086	4.1
Diseases of the urinary system	855	3.2
Total	16972	63.8

Note. All patients in the total population had data entered to correlate the insurance status with primary diagnosis but only the top 10 were listed above.

Table 22

Insured vs. Uninsured Non-Urgent Population: Categories of Health Care Conditions

Top 10 Categories of Illnesses or Diseases that were ED visits for Insured Group of the Non-Urgent Population	Number and Percentage of Cases within the Group	
	n	%
General Symptoms of the cardiovascular, urinary, digestive and abdominal, respiratory, skin, head and neck, and nervous and musculoskeletal systems	9361	14.4
Diseases of the musculoskeletal system and connective tissues	6714	10.3
Sprains of joints and muscles	5772	8.9
Open wounds	4745	7.3
Contusions and crushing injuries	3949	6.1
Acute Respiratory Infections	3276	5.0
Diseases of the skin and subcutaneous tissue	2437	3.7
Diseases of the oral cavity, salivary glands, and jaw	2279	3.5
Fractures	2184	3.4
Diseases of the urinary system	2004	3.1
Total	42721	65.7

Top 10 Categories of Illnesses or Diseases that were ED visits for Uninsured Group of the Non-Urgent Population	Number and Percentage of Cases within the Group	
	n	%
General Symptoms of the cardiovascular, urinary, digestive and abdominal, respiratory, skin, head and neck, and nervous and musculoskeletal systems	2138	11.6
Diseases of the musculoskeletal system and connective tissues	1994	10.8
Sprains of joints and muscles	1704	9.3
Diseases of the oral cavity, salivary glands, and jaw	1286	7.0
Acute Respiratory Infections	1201	6.5
Diseases of the skin and subcutaneous tissue	1107	6.0
Contusions and crushing injuries	1027	5.6
Open wounds	930	5.1
Neurotic disorders, personality disorders, and other nonpsychotic mental disorders	831	4.5
Chronic Obstructive Pulmonary Disorders and allied conditions	626	3.4
Total	12844	69.8

Note. All patients in the non-urgent population had data entered to correlate the insurance status with primary diagnosis but only the top 10 were listed above.