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# Improving Dental Care Access for Low-Income Populations

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Improving Dental Care Access for Low-Income Populations

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### Abstract

The Surgeon General's Call to Action report in 2000 established the problem of *oral health* disparities as an important public health issue. Because of its widespread prevalence and preventable nature, the problem of untreated dental caries and poor oral health has been called a "neglected *epidemic*." As in other areas of health, the *poor* often carry a disproportionate burden of oral health problems. The purpose of this research was to examine the patient population who utilized the dental clinic at the Good Neighbor House, a health and human service organization that serves as a safety net clinic, to determine the *dental needs* of patients there and how those needs change among different income levels, races, and ages. Previous literature on oral health disparities identified these characteristics as having a statistically significant relationship with untreated and more severe dental needs. The charts of all dental patients receiving care at the clinic between August 2011 and August 2012 were reviewed to document patient demographic characteristics, including *income*, *age*, and *race*. Treatment plans, developed by dentists at the patients' initial visit, were also reviewed to document the specific treatment needs of the patients. These needs were then categorized by *severity* level. Chi-square analysis was used to determine any statistically significant relationships. The findings were consistent with previous literature that a significant relationship exists between income and dental care needs, while age and race were had no statistically significant relationship to dental care needs.

*Keywords:* oral health, epidemic, dental needs, income, race, age, severity

### **Improving Dental Care Access for Low-Income Populations**

Improvement of oral health has recently been identified as a priority in the United States as well as throughout the world. The Surgeon General's Call to Action in 2000 firmly established the issue of oral health and disparities in population subgroups (Evans & Kleinman, 2000). The report brought much-needed attention to the problem and proposed prevention efforts and strategies to help combat oral health deficiencies. Since 2000, much progress has been made in the promotion of oral health. However, disparities still exist. Socioeconomic status is just as strong a predictor of oral health as it has been in most other aspects of wellness. The poor carry a disproportionate burden of tooth decay, dental pain, and overall lower levels of oral health. Among the leading causes of this oral health disparity is the issue of access to dental care services. Many people of limited economic means often defer, delay, or refuse to seek treatment based on the high cost of treatment and an undervaluation of need. Providing greater access to affordable care is imperative to improving oral health, especially among poor populations. To accomplish this, the problems surrounding access to oral health care must be identified and correctly framed before progress can be made in delivering more widespread, easier access to quality dental care.

#### **Statement of Purpose**

This report examines the issue of disparities in access to dental care, particularly among individuals of lower socioeconomic status. Of specific interest in the study are the effects of race, income, and dental insurance coverage on the utilization of dental services and overall oral health. A review of other studies on the habits and behaviors of people most in need of dental care and yet unable to afford it or find it provides insights as to how health care resources and efforts among the dental workforce can be distributed to make the greatest positive impact.

Finally, an assessment of the infrastructure of safety net dental clinics offers a locally relevant example of how such clinics may improve their efficiency in the delivery of dental care to underserved populations.

### **Literature Review**

In May of 2000, the United States Surgeon General issued a report that was the first of its kind in calling for increased oral health awareness and maintenance (Allukian, 2008). Until then, oral health status had been steadily improving in recent decades due to advances in technology and extensive community water fluoridation efforts. However, untreated tooth decay and other oral maladies still remain widespread and persistent health issues. Due to its prevalence and largely preventable nature, the problem of poor oral health was labeled a “neglected epidemic” by those who advocated placing a higher priority level upon it and making it a fundamental element in health programs and assessments (Allukian, 2008). Previous studies have noted that while oral health is a problem everywhere, it is often worse for low-income populations, especially children. It has been estimated to be as much as five times worse for children aged 2 to 5 when compared to high-income children of that same age (Allukian, 2008). When comparing those without dental insurance to those who carry it- another indicator closely tied to income- uninsured persons have an average of four times as many unmet dental needs as people with insurance (Allukian, 2008).

As identified in the Surgeon General’s report, one of key components of implementing positive changes in oral health is changing the long-held beliefs and perceptions concerning its importance and relevance to systemic health. The perceived value of oral health and its relation to general health was identified in a 2002 study. The study highlights the perceptions of the public, of policymakers, and in some cases, of medical professionals, that oral health was of less

importance because oral diseases did not present life-threatening situations (Pyle, 2002). The lack of awareness concerning the connection between oral health and systemic health may play a key role in people's attitudes toward seeking regular dental care. The associations between chronic oral conditions and other health problems such as coronary heart disease, diabetes, stroke, and premature and low-birthweight babies are the topics of recent oral health literature (Benjamin, 2010). For many people, regular visits to the dentist may be the only encounter they have with a healthcare professional and should be viewed as an opportunity to assess different pathologies, especially those that manifest within the mouth. A study by Strauss, Alfano, Shelly, and Fulmer (2008) of people who had visited a dentist within the previous year revealed that of those surveyed, 26 percent of children and nearly 23 percent of adults did not visit a primary care physician within that same year. This means that for an average of 19.5 million people each year, the only health care professional seen may be a dentist. The dentist's check-ups during preventive care visits are an important time and place to assess a patient's overall health, particularly for those with limited access to other areas of health care. By making oral health maintenance a higher-valued priority for individuals through coordinated efforts to improve oral health literacy, people will learn to become stakeholders in their own oral health. Doing so will ultimately lead to the greatest potential for positive change on a population scale.

Changing the way people think about oral health and making it a priority was important enough that it was included in the Healthy People 2000 objectives. Healthy People details the need for improvement in the areas of eliminating disparities and improving access for all (National Center for Health Statistics [NCHS], 2001). Oral health is improving and percentages of untreated tooth decay are declining, as data from the past forty years illustrates (National Institute of Dental and Craniofacial Research, 2012). This decline is due in large part to the



increasing number of community water fluoridation programs. Water fluoridation is widely recognized to be one of the most effective means of preventing dental caries, commonly called cavities (Benjamin, 2010). However, there is still a great deal of room for improvement. Despite the fact that dental diseases are largely preventable with routine care and maintenance, dental caries and periodontal disease are among the most common chronic diseases in the country. Dental caries is the most common disease of childhood, occurring with nearly five times the prevalence of asthma and allergies (Benjamin, 2010). Approximately 53 million Americans live with untreated decay in their permanent teeth (Benjamin, 2010). In adults, advancing periodontal disease, a chronic infection of the gums and bone, is the leading cause of tooth loss. Because of this and other oral diseases, it is estimated that 25 percent of the population aged 65 and older are edentulous, or completely without teeth (Benjamin, 2010). It is clear that dental caries and other oral diseases are ubiquitous problems that demands focused attention in finding solutions. With the right approach and efficient allocation of resources, the consequences of these preventable diseases may well be alleviated.

### **Unmet Dental Needs: The Scope of the Problem**

Like so many other health indicators, the burden of poor oral health disproportionately affects minorities and the poor. Often times, these circumstances go hand-in-hand. Census data from 2000 to 2007 shows that black and Hispanic children were nearly twice as likely to be living in poverty as non-Hispanic White and Asian children (Edelstein & Chinn, 2009). Exacerbating the problem is the increasing percentage of those living below the Federal Poverty Guidelines. There was a two percent increase in children living in poverty was found in census data from 2000 and 2007 (Edelstein & Chinn, 2009). According to NHANES data from 2002, 55 percent of these children living in poverty had experienced tooth decay, a number almost

twice that of their high-income peers (Russell, 2010). As for adults, a study by the Henry J. Kaiser Foundation (2012) showed similar findings. According to the data, gathered between 1999 and 2004, only 12 percent of American adults living at or above 400 percent of the federal poverty level have untreated dental caries. As income levels begin to decline, the rate of untreated dental caries in adults rises, until the number of adults with untreated caries living at or below the poverty level reaches 42 percent. Clearly, socioeconomic status is a strong predictor of caries experience, and general oral health by proxy.

Compounding the problem of poor oral health is a lack of access to dental services, particularly for low-income populations. While this population segment is growing, the number of dentists per capita has been declining over the previous decades (Mertz & O'Neil, 2002). It is projected that in the next ten years, the number of new dental school graduates will not be able to keep pace with the number of retiring dentists (Solomon, 2004). Participation by dentists in Medicaid has traditionally been weak due in large part to low reimbursements and patient unreliability. The low number of dentists accepting Medicaid increases the difficulties that low-income populations have in accessing care as the use of Medicaid funds is often the only way in which they can afford care. For older Americans who depend on Medicare as their primary means of health insurance, no dental coverage is offered through the program, even for routine preventive care visits (Medicare Rights Center, 2010).

Studies conducted on oral health status across the United States indicate that while some measures of oral health are improving, the gap is widening in the provision of care between high and low income earners (Stanton & Rutherford, 2003). Minorities, the elderly, and poor populations are more likely to have untreated dental needs and less able to access services. In 1996, only 31 percent of Maryland's Medicaid-enrolled children received preventive dental care,

despite coverage being mandatory for all Medicaid-eligible children until the age of 21 (Stanton & Rutherford, 2003). Similar statistics were seen a year later in Georgia and Alabama, where only 30 percent and 19 percent received dental care, respectively. In North Carolina, almost half of the state's Medicaid-enrolled children had never accessed dental care. Of those that did access preventive services, less than a third received the follow-up care necessary to have all of their diagnosed needs met (Stanton & Rutherford, 2003).

Nationally, trends in dental care usage follow the same demographic patterns that other studies focusing on smaller regional populations have indicated. In 2008, dental service usage peaked in age groups from 35 to 65, with over 72 percent of adults reporting a dental visit within the previous twelve months (Centers for Disease Control and Prevention [CDC], 2010). After age 65, that number drops to 67 percent. The disparities among different races were also noted in the 2008 data, as over 72 percent of whites received dental care compared to only 59 percent of African-Americans and only 58 percent of Hispanics. A key predictor in knowing how and when to seek dental care, education level, was also highly relevant. In 2008, just over 46 percent of people with less than a high school diploma reported visiting a dentist within the past year. That percentage rises with increasing levels of educational attainment, as 81 percent of college graduates report visiting a dentist. The most significant predictor of accessing dental services in 2006, however, was income. Fewer than 46 percent of people earning less than \$15,000 annually had received care within the past year. As income increased, the number of people reporting visits also grew, with over 80 percent of Americans earning more than \$50,000 a year reporting visits (CDC, 2010).

Despite having higher rates of periodontal disease and tooth decay, the elderly often do not seek dental care because of financial access barriers. To illustrate this, Agency for

Healthcare Research & Quality researchers studied the effects of a Medicare-waiver program that, unlike traditional Medicare, offered coverage for dental services. Among elderly African-American enrollees in the program, the probability of utilizing dental services became twice that of elderly Caucasians (Stanton & Rutherford, 2003). Given that African-Americans and other racial minorities are more likely have lower incomes than Caucasians (Institute of Medicine [IOM], 2011), the increase in service usage brought about by the removal of the financial barrier illustrates how large a role cost plays in the decision to access dental care.

In Ohio, the problem of poor oral health is a major one. For low-income populations, it ranks as the number one unmet health care need. Like the rest of the country, poor non-white residents and/or people living in Appalachian regions are most likely to carry this burden. Over forty percent of Ohio adults, nearly 3.5 million people, are uninsured for dental care, with those aged 65 and over nearly twice as likely to be without insurance (Ohio Department of Health [ODH], 2007).

Ohio Medicaid programs, like so many others, have only a limited effect on improving oral health. In 2005, only one-third of adults aged 19-64 reported a dental visit in that year (ODH, 2007). For those aged 65 and over, only about 25 percent of Medicaid enrollees reported a visit (ODH, 2007).

Only a quarter of Ohio dentists submitted at least one Medicaid claim in 2005, illustrating the reluctance of many dentists to accept Medicaid patients. However, the need for care is certainly evident. Approximately one hundred safety net dental clinics are in operation within the state to try to keep up with the growing oral health epidemic (ODH, 2007).

Still, despite the efforts of safety net dental clinics, over fifty federally-designated health professional shortage areas have been identified in Ohio due to a poor distribution of dentists for

those areas, most of which are rural (ODH, 2007). Combined with poor health knowledge and low self-efficacy, the problem of limited access has a disproportionately stronger effect on lower-income populations in Ohio. This finding indicated that for poor, less-educated populations, removing the cost barrier alone can have a profound effect on improving access.

A closer examination of Ohio statistics mirrors national data from the same 2008 time period. Among various age groups, those who reporting dental visits within the past 12 months peaked in the 35 to 65 range, with over 75 percent of people confirming a visit within that time frame. This was followed by a sharp decline among those 65 years and older, with only 65 percent reporting a visit within the previous year (CDC, 2008). As an individual's highest education level earned improves from below high school diploma to college degree, reported dental visits within the previous year increases from 50 percent to 80 percent (CDC, 2008). While only 48 percent of those earning less than \$15,000 each year visited a dentist, over 83 percent of people making over \$50,000 were able to seek care (CDC, 2008). Examining access by race, 72 percent of white Ohioans visited a dentist in 2008, 12 percent more than African-American residents (CDC, 2008).

### **The Dental Safety Net**

Although the problem of poor oral health has shown improvement overall, profound disparities still exist among some segments of the population (CDC, 2009). Access to necessary dental services is becoming more difficult, disproportionately so for the poor (IOM, 2011). Low-income populations are more likely than wealthier demographics to utilize emergency dental care due to a lack of routine maintenance (IOM, 2011). In order to address the problem, systemic changes must be made to remedy the growing disconnect between the way in which dental care is delivered and the needs of the population.

‘Safety net’ dental clinics are systems established to deal with the problem of access to oral health services. The dental safety net is loosely defined as the network of facilities, healthcare providers, and payment programs available to poor and underserved populations that allow for the provision of dental care (Edelstein, 2010). The dental safety net is somewhat distinct from the private dental practice paradigm, where the goal is to accommodate both patient needs and wants beyond what is necessary to meet the standards of basic oral health as well as maximize profits. In safety net clinics, the treatments able to be rendered are often limited to basic preventive, restorative, and extraction procedures due to the cost-prohibitive nature of more expensive cosmetic procedures. The main objectives are to alleviate the patient’s dentofacial pain and to return patients to a healthy baseline of oral health.

In Ohio, one tool that has been created to equip the public with knowledge concerning available safety net resources, data, and clinic locations is a web-based portal maintained in a collaborative effort between the state health department’s Oral Health Program and the National Center for Maternal and Child Health (National Center for Maternal and Child Health, 2012). A comprehensive listing of safety net clinics in the state identifies 125 facilities available to residents. A search option helps users find clinics with the ‘safety net’ designation by name, county, city, services, and program type. While the dental safety net as a whole is considered to be a somewhat disorganized conglomeration of separate clinics, Ohio’s online site has attempted to centralize information and resources and provide a framework both for patients and health professionals to access and deliver dental care more effectively.

Much of the dental safety net, both nationally and at the state level, is made up of clinics officially recognized as Federally Qualified Health Centers (FQHCs). Clinics with this designation are community-based organizations specifically designed to serve low-income

populations with limited access to services. To meet the needs of these populations, these clinics must be located in areas deemed “medically underserved” by the government. In Ohio, 615 of these areas exist, 26 of which are located within Montgomery County (ODH, 2012). Although FQHCs are available to people of all ages, races, and economic conditions, the demographics within FQHCs are indicative of the need for improving health care access among the poor. 2009 data showed that while only 33 percent of the population nationwide was living below 200 percent of the federal poverty level, the population of that same socioeconomic category made up over 92 percent of FQHC patients (American Dental Association [ADA], 2011). And although 16 percent of the country’s population was completely uninsured (without private insurance, Medicare, or Medicaid), that figure among FQHC users rose to 38 percent. In terms of racial demographics, almost 27 percent of FQHC patients were African-American, despite comprising only 13 percent of the nation’s total population (ADA, 2011). Given this data, those utilizing the services rendered at FQHCs are primarily poor residents, with the uninsured and minorities making up a disproportionate market share of the patients.

FQHCs are defined as facilities that are federally funded through grants under section 300 of the Public Health Service Act (ADA, 2011). In 2009, 1,331 facilities in the United States were recognized as FQHCs. Nearly three-quarters of these clinics provided on-site dental care. Health care centers with this designation depend partially on a federal funding source and compete for 330 grant funds every five years with other FQHCs. 330 grants are federal funds defined by Section 330 of the Public Health Service Act as funds available to organizations providing healthcare to underserved populations (Rural Assistance Center, 2012). In the US, 330 grant funds, however, typically comprise only up to a quarter of a given facility’s overall revenues due to a limited amount of funds available for a large number of applicant clinics.

Other sources of revenue for FQHCs include Medicare and Medicaid payments, grants from individual states and foundations, and direct payment from patients and/or private insurance companies (ODH, 2012). Because reimbursement from federal insurance programs like Medicaid is typically low, acceptance of private insurance plans has proven to be essential for FQHCs. Private insurance not only supplements the finite amount of grant funding available, but also allows a broader array of services to be performed for patients who can afford it. The ability to perform and gain competence in a variety of procedures, in turn, improves recruitment among the dental health care workforce as it allows dentists the opportunity to use more of the skills for which they were trained. Attracting dental professionals to join FQHCs is essential to the viability of these clinics. New dentists entering the workforce in these clinics may also be eligible for student loan repayments through the National Health Service Corps. This encourages the expansion of FQHCs and, in turn, promotes greater accessibility of oral health services for underserved populations (ADA, 2011). Still, attracting dentists to work in these types of clinics has proven difficult, with only 2 percent of the dental workforce providing care within FQHCs (ADA, 2011).

### **Mid-Level Practitioners**

While the demand for dental services by low-income populations is growing, the safety net dental clinics designed to serve them are extremely limited in their capacity to meet the needs. As of 2010, 82 million Americans were recognized as having incomes less than twice that of the federal poverty level, underscoring the financial barriers that exist to seeking care (Edelstein, 2010). However, only 20 percent of dentists across the country actively participate in Medicaid programs designed to assist these populations. Even with financial assistance to help overcome cost barriers, the availability of providers has become another obstacle in seeking care.



One solution that has been proposed to help remedy both of these concerns is the use of mid-level dental practitioners, dental care providers that are trained in basic dental procedures but are not licensed as dentists. Analogous to nurse practitioners in medicine, the use of mid-level practitioners is a relatively new and controversial issue (Edelstein, 2010).

Proponents of using mid-level practitioners have argued that it will expand the availability of necessary services to those who would not normally have access to dental care (Edelstein, 2011). Additionally, because of the basic nature of their services provided, mid-level practitioners often charge less than traditional private practice dentists. In other countries such as Australia, Canada, and England, where the use of these mid-level practitioners (also called ‘dental therapists’) has been common, these health care workers have typically been selected from underserved population areas in order to minimize cultural, financial, and/or language differences that often exist in the doctor-patient relationship (Edelstein, 2011). With rudimentary training, mid-level practitioners are frequently employed in safety net dental clinic settings within underserved areas. Advocates of mid-level practitioners point to the ease with which the dental health workforce can be expanded and tailored more to the needs of patients, particularly in areas where access is limited by financial or geographical barriers, as the ideal solution to many of the nation’s dental care access problems (Mouradian, 2006).

Opponents to the use of mid-level practitioners cite several reasons why the implementation of this type of personnel may in fact be counterproductive to solving the problem. First, dental therapists receive only two to three years of instruction following high school compared to the eight years of combined undergraduate and doctoral education that dentists undertake (Edelstein, 2011). Most dental professionals are reluctant to offer support for mid-level practitioners performing many of the same procedures that dentists do with only a

fraction of the training and education. Allowing dental therapists to carry out these procedures instead of dentists simply because they may be more readily available to low-income populations constitutes what many in the profession have called “second class care” that ultimately puts the health of individuals and the public at risk. Overall, instituting mid-level practitioners would be a “disruptive innovation” that would diminish the market share enjoyed by dentists in private practice as well as their professional authority in patient diagnosis and care (Edelstein, 2011).

Currently, mid-level practitioners are only used in Alaska and Minnesota, although other states have considered adding legislation that would allow them to practice (Cauthon, 2012). The position of dental therapist is a relatively new one, making it difficult to assess whether or not it represents a solution to the problem of access and availability for low-income populations or if it will contribute further to the health disparities between socioeconomic classes by creating a market of substandard care masked as relief.

### **Health Care Reform Laws**

The issue of access to adequate care, not only in the arena of oral health but also for general health, is of such importance that it was the focus of a 2010 federal bill entitled the Patient Protection and Affordable Care Act (H.R. 3590, 2009). The objectives of the law were to expand insurance coverage to over 30 million uninsured Americans, to rein in rising costs in health care, and to improve the standard of care for all Americans by reorganizing the current health care infrastructure (Sparer, 2011). The law contains six fundamental elements designed to help reach these objectives. First, Medicaid coverage would be extended to Americans living at or below 133 percent of the federal poverty level. Second, insurance exchange programs would be created by each state for self-employed and small business workers in which the federal government provides funding for premiums on behalf of workers with an income at or below 400

percent of the federal poverty level. Third, companies with more than fifty employees would incur a financial penalty for not offering health care coverage. For companies that do offer insurance coverage to low-income employees, however, tax credits would be given to that company. New federal regulations would also be put into place that would abolish traditional practices by the insurance industry intended to maximize profits, including denial of applicants with pre-existing conditions and setting lifetime maximums on insurance coverage. Finally, financial penalties would be levied on anyone without any form of medical insurance, either government or private. In order not to risk partisan opposition, the government avoided sensitive political issues in health care reform such as price and service usage regulation and opted instead to allow free-market principles, such as basing provider reimbursement to performance and outcomes, to remain in play where they could (Sparer, 2011).

Of particular interest to the issue of oral health in the new legislation was the law's focus on primary and preventive care for the underserved through new programs, particularly with the approval of \$11 million for the creation of new federally qualified community health centers and the development of a health care system with more integration between all health care providers, including dentists. The law makes the provision of dental care coverage for all children mandatory by including it in the essential benefit package (Edelstein & Chinn, 2009). While coverage for children is extended, the law does not require insurance coverage of dental services for adults in the same way it requires medical insurance coverage. Although the legislation allows for greater eligibility and enrollment in Medicaid for adults, the decision as to what services to include within that coverage is ultimately left to the individual states. Many states do not include dental coverage for adults as part of their Medicaid plans, negating any potential oral health benefits from expanded coverage (Sparer, 2011).

Despite this, the Patient Protection and Affordable Care Act directly promotes oral health in a variety of other ways. The law includes the creation of programs and scholarships intended to help expand the dental workforce with the goal of creating more access opportunity for underserved populations. Additionally, the law calls for a commission to assess the sufficiency of Medicaid reimbursements to dentists, which could help improve payments for services and increase participation in Medicaid among more dentists. Finally, the central focus of the PPACA is the establishment of a “medical home” where all facets of health care, including oral health, are accounted for and encouraged in order to achieve higher degrees of health care access and outcomes for all (Sparer, 2011).

### **Overcoming Disparities**

The lack of access to dental care among low-income populations is recognized as a significant public health issue. One crucial step in overcoming this problem is communicating the special needs and unique circumstances of people within this population to the dental health workforce so that solutions can be more effectively tailored to the existing problems. Several studies have been conducted to gain a deeper understanding of the access barriers faced by low-income individuals. Kelly, Binkley, Neace, and Gale (2005) sought to identify the concerns of low-income caregivers about accessing oral health services for Medicaid-enrolled children. The research focused on poor African-American and Caucasian caregivers and examined individuals who accessed dental services (utilizing) and those who did not (nonutilizing) within each grouping. Caregivers who utilized Medicaid dental services were generally found to have higher levels of education, especially as to the importance of oral health in overall health. However, both utilizing and nonutilizing caregivers clarified some key barriers to access. One shared constraint was the ability to overcome behaviors about oral health instilled in them at a young

age from their family and/or culture. Often, having little to no access to dental care in their youth, combined with the low value placed upon it by their parents, influenced how caregivers viewed the need for dental care, especially for themselves, as adults (Kelly, Binkley, Neace, & Gale, 2005). It is important, then, that dental care providers hoping to lessen the oral health burden on the poor recognize that improving education and changing traditional beliefs within that community about oral hygiene will lay the foundation for success.

Those who did not utilize dental services pointed to school absence policies as a main reason as to why they chose not to visit the dentist (Kelly et al., 2005). This, coupled with difficulties arranging transportation to and from dental visits, reflects a need for dentists to operate outside of traditional school and work hours to accommodate more patients. It is important, too, that schools come to value dental visits in the same way that doctor's appointments are that are commonly excused.

One of the key differences between those who access care and those who did not lies in the perception of need. Kelly et al. (2005) report that caregivers who did not access dental services expressed personal appearance, self-confidence, and pain as the most important reasons for visiting a dentist, disregarding the systemic health benefits and illustrating a view of dental care as an emergency service rather than a preventive, maintenance-based routine. This finding was similar to answers submitted by respondents in a study surveying the perceptions of oral health care access among low-income adults (Wallace, 2012). Within that community, it was found that the need for dental treatment was commonly associated with conditions such as toothaches, large cavities, missing or fractured teeth, and other problems that are only brought to the attention of dentists when they become too painful to withstand (Wallace & Macentee, 2012).

Changing this mentality into one that values prevention over treatment, while difficult to overcome, will yield positive results for low-income populations.

Another common complaint among low-income patients as well as dentists is the lack of services covered by government dental benefits (Wallace & Macentee, 2012). Although extractions are necessary for many individuals and are usually covered, public insurances do not provide coverage for any prosthetic replacements. People would rather keep what damaged, painful teeth they have for as long as they can than opt for extractions that would improve their health but leave them with missing teeth, diminished self-confidence, and an inability to pay for an acceptable replacement. Dentists then must work with the public insurance systems to compromise on a fee schedule and a set of covered services that satisfies both the health needs of the low-income populations and the financial needs of the providers.

Improving cultural competency among the dental health care workforce is another key to delivering better care to underserved communities. Because health care providers and low-income patients are often on opposing ends of the socioeconomic spectrum, it is important that providers be sensitive to the needs of people different from themselves and be able to communicate effectively with them. Cultural competency is acknowledged as a critical skill for dental care providers, so much so that all thirty-four dental schools that responded to a survey by Rowland, Bean, and Casamassimo (2006) reported having integrating the concept into their curriculum, either as a separate course or as part of several courses within their programs (Gregorczyk & Bailit, 2008). Still, a quarter of the dental students polled in a 2003 ADEA survey believed that more time should be allocated in dental schools on the subject of cultural competency, illustrating the value future professionals place on being able to adapt to the country's changing demographics (Evans & Kleinman, 2000). In the survey of barriers for low-

income caregivers, one African-American participant remarked on the “cultural whiteness” of the office she visited for care. Recognizing what aspects of the dental care experience, including the surroundings and the doctor-patient interaction, could potentially make some patients uncomfortable and working to remedy them is one way in which providers can easily remove one of the many access barriers for low-income populations.

## **Methods**

### **Research Questions**

This is exploratory research. This research examined the following questions:

1. What is the level of severity of treatment need by poverty level?
2. How much of the base cost of treatment is recovered through patient payments?
3. What percentages of treatment plan items are completed?
4. What are the levels of severity of treatment needs by gender?
5. How does the severity level of treatment needed differ between age groups?
6. How does the severity level of treatment needed differ between races?
7. How does the severity level of treatment needed relate to the percentage of treatment completed?
8. How did patient age relate to the percentage of treatment plan items completed?
9. How does race relate to the percentage of treatment plan items completed?
10. How does the severity level of treatment needed differ between new and established patients?

The goals of the study were to determine the type of dental care needs of patients at safety net clinics, to determine how much of the necessary treatment was completed by patients, and to determine the percentage of reimbursement as a function of the base cost for completed

procedures. Using different patient demographic characteristics, these items were examined as they related to different subgroups within the patient population. The results of the study will then be provided to the Good Neighbor House to provide insights as to how to better serve the needs of their patient population. An analysis of the costs recovered for treatment may also be used to support grant-writing and funding requests for the clinic's operations.

The Good Neighbor House, a health and human services organization in Dayton, Ohio serves as a safety net dental clinic for Dayton and the surrounding areas. Good Neighbor House provides care to low-income people. Individuals may receive a discount on medical and dental services there based on their income. Dentists examining patients at the Good Neighbor House prepare a patient treatment plan for each patient who is examined. Treatment plans contain information about necessary treatment needs based upon radiographs and intraoral examinations, the base cost of each treatment, and the adjusted costs for each patient based upon income level. Usual and customary rates (UCR) at the Good Neighbor House are based on Medicaid reimbursement rates for dental services.

Dependent variables in the study include the severity of treatment needs, the percent of treatment plan items completed, and the percent of the base cost of treatment recovered through patient payments. Independent variables to be examined include income and race, both of which are self-reported in patient charts. Due to the small sample size of patients identifying their race as other than white or black, the few members of this group were added to the black population for statistical purposes. Income is confirmed by tax returns. Patients are required to present tax returns to determine eligibility for discounts on dental services.

Dependent variables are the presumed effect or response measured by a researcher in a study (University of North Carolina at Pembroke [UNCP], 2012). Because this study aims to



quantify and qualify the effects of poverty upon measures of oral health, outcomes such as the severity of treatment needed, the costs associated with treatment, and percent of completed treatment, these measures serve as dependent variables.

The severity of treatment need was determined by classifying items on individual patient treatment plans as preventive, basic restorative, and major restorative. Preventive needs were comprised only of preventive services (cleanings and sealants). Basic restorative needs consisted of procedures that addressed compromised tooth structure without nerve involvement, which in the case of Good Neighbor House, included only amalgam and composite fillings. Major restorative needs included procedures that addressed needs with nerve involvement, including extractions and root canal therapies. Treatment needs were diagnosed by a variety of contract and volunteer dentists at the clinic.

In order to determine the percentage of treatment plan items completed, treatment plans from initial visits were assessed and each item on the treatment plan subsequently completed counted toward a total completion percentage. Items on patient treatment plans were coded according to the American Dental Association's Common Dental Terminology (CDT) codes.

Based upon the treatment items listed by CDT code, the percentage of funds recovered via patient payments were calculated by assessing the amount paid by patients for each treatment item completed against the usual and customary rates (UCRs) listed on the Good Neighbor House's fee schedule.

Independent variables are the presumed cause or variable(s) manipulated by a researcher in a study (UNCP, 2012). Because income level and race were the basis of comparison for the dependent variables, they served as independent variables.

Data was collected from health history/patient information forms as well as treatment plans in patient charts at the Good Neighbor House. Information was abstracted from existing treatment plans, exposing patients to no risk. No names, birthdates, or other individual identifiers were included in the data abstracted from the treatment plan. Data files did include a unique record number that allowed the investigator to refer back to information on a treatment plan in the event of further questions about the data. The deidentified data was kept in a secure file on a password-protected computer in order to ensure confidentiality of the information. In order to ensure validity and minimize selection bias, all dental patients aged 18 years and older seen at Good Neighbor House between August 2011 and August 2012 were used in data analysis.

Classification of treatment plan severity by income level and by race provided a correlational, qualitative non-experimental design. Percentage of treatment plan completed and the percent of the base cost recovered by income level and by race provided quantitative, correlational study designs.

Tables were constructed to show the severity of treatment needs by income, race, age, and gender. Included in the tables were numbers and percentages of each independent variable in the spectrum of severity of needs. Tables also showed the base cost for procedures versus the amount paid by patients according to income level and race. Additional tables showed the percentage of treatment plan items completed by race and income. The data was analyzed using SPSS software to generate cross-tabulation tables and perform chi-square tests.

## **Results**

Table 1 shows selected demographic characteristics for patients at the Good Neighbor House dental clinic from August 2011 to August 2012.

Table 1

*Patient Demographic Characteristics*

	N	%
<b>Gender</b>		
Male	203	43.6
Female	263	56.4
<b>Age</b>		
18-34	148	31.9
35-49	155	33.4
50-82	161	34.7
<b>Race</b>		
White	270	57.9
Black/Other	196	42.1
<b>Annual Income</b>		
No income/Not reported	145	30.9
Less than \$15,000	187	39.9
\$15,000 plus	137	29.2
<b>Patient Status</b>		
New	335	71.9
Established	131	28.1
<b>Severity of Treatment Needs</b>		
Preventive	38	8.2
Moderate Restorative	123	26.4
Major Restorative	305	65.5
<b>Percentage of Treatment Complete</b>		
0%	98	21.2
Less than 50%	67	14.5
51% to 99%	95	20.5
100%	203	43.8

Fifty-six percent of patients at the Good Neighbor House dental clinic were female. Patient age was relatively evenly distributed with approximately one-third of patients falling into each age category. The majority of patients at the Good Neighbor House patients were White (58%). Forty percent of patients report incomes of less than \$15,000 a year, with 31 percent not reporting income, either because they chose not to disclose the information, or in twelve cases, because there was no income to be reported. Seventy-two percent of individuals seen at the

dental clinic in the period were identified as new patients, having never sought treatment at the Good Neighbor House in the past. In terms of needs diagnosed by clinic dentists, 66 percent of individuals required treatment, which addressed conditions involving nerve tissue (root canals and/or extractions- major restorative), 26 percent required treatment that addressed replacing tooth structure and function (fillings- basic restorative), and eight percent required only “preventive” care (cleanings). Forty-four percent of patients completed all treatment items on their treatment plan, 21 percent of patients completed less than all but more than half of the treatment items, and 15 percent completed less than half of the treatment items. Twenty-one percent completed none of the items on their treatment plan.

Table 2 shows the patient status by the severity of treatment needs. New patients were more likely to need major restorative services and established patients were more likely to need only preventive services ( $p=0.013$ ).

Table 2

*Patient Status by Severity of Treatment Needs*

Patient Status	Preventive		Basic Restorative		Major Restorative		Total	
	N	%	N	%	N	%	N	%
New	20	6.0	86	25.7	229	68.4	335	100.0
Established	18	13.7	37	28.2	76	58.0	131	100.0
Total	38	8.2	123	26.4	305	65.5	466	100.0

Chi-Square=8.748 df=2 p=0.013

Table 3 shows the differences in severity levels of treatment diagnosed by dentists for patients of different income groups at the Good Neighbor House. Differences in severity of treatment by income group exist. Analysis (not shown) indicates that a statistically significant difference exists at each level of income. Patients with no reported income were most likely to have major restorative dental work (81%), and 56% of patients reporting incomes of greater than

\$15,000 needed major restorative treatment. Patients with incomes of greater than \$15,000 were most likely to need only preventive care (12%).

Table 3

*Income Level by Severity of Treatment Needs*

Annual Income	Preventive		Basic Restorative		Major Restorative		Total	
	N	%	N	%	N	%	N	%
No income/Not reported	7	4.8	21	14.5	117	80.7	145	100.0
Less than \$15,000	15	8.0	60	32.1	112	59.9	187	100.0
\$15,000 plus	17	12.4	43	31.4	77	56.2	137	100.0
Total	39	8.3	124	26.4	306	65.2	469	100.0

Chi-Square=24.103 df=4 p=0.000

Table 4 shows the relationship between the severity of diagnosed treatment needs diagnosed by gender. There is no statistically significant relationship between gender and the severity of treatment needed.

Table 4

*Gender by Severity of Treatment Needs*

Gender	Preventive		Basic Restorative		Major Restorative		Total	
	N	%	N	%	N	%	N	%
Male	16	7.9	57	28	130	64	203	100.0
Female	22	8.4	66	25.1	175	66.5	263	100.0
Total	38	8.2	123	26.4	305	65.5	466	100.0

Chi-Square 0.529 df=2 p=0.768

Table 5 illustrates differences in the severity of treatment needs for three different age groups of dental patients at the Good Neighbor House. There is no significant difference in treatment needs by age. The majority of necessary treatments for all age groups were in the category of major restorative.

Table 5

*Severity of Treatment Needs by Age Group*

Age Range	Preventive		Basic Restorative		Major Restorative		Total	
	N	%	N	%	N	%	N	%
18-34	16	10.8	33	22.3	99	66.9	148	100.0
35-49	9	5.8	42	27.1	104	67.1	155	100.0
50-82	13	8.1	47	29.2	101	62.7	161	100.0
Total	38	8.2	122	26.3	304	65.5	464	100.0

Chi-Square=4.063 df=4 p=0.398

Table 6 shows the relationship between severity of treatment need and race. No significant difference was observed in the treatment needs of white patients and black patient.

Table 6

*Race by Severity of Treatment Needs*

Race	Preventive		Basic Restorative		Major Restorative		Total	
	N	%	N	%	N	%	N	%
White	18	6.8	69	26.0	178	67.2	265	57.4
Black/Other*	21	10.7	55	27.9	121	61.4	197	42.6
Total	39	8.4	124	26.8	299	64.7	462	100.0

Chi-Square=2.728 df=2 p=0.256

Table 7 shows the relationship between treatment plan completion and the severity level of the treatment diagnosed. Further analysis (not shown) reveals significant differences between the different severity levels of dental care needed and amount of care completed.

Table 7

*Severity of Treatment by Percentage of Treatment Plan Completion*

Severity of treatment	0%		Less than 50%		50 to 99%		100%		Total	
	N	%	N	%	N	%	N	%	N	%
Preventive	13	36.1	0	0.0	1	2.8	22	61.1	36	100.0
Basic Restorative	33	26.6	15	12.1	35	28.2	41	33.1	124	100.0
Major Restorative	52	17.2	52	17.2	59	19.5	140	46.2	303	100.0
Total	98	21.2	67	14.5	95	20.5	203	43.8	463	100.0

Chi-Square = 12.04 df=6 p=0.007

Only 33 percent the patients who were scheduled for basic restorative care completed all treatment plan items, compared to the 61 percent ( $p < 0.01$ ) of patients who needed only preventive care. Forty-six percent of patients who required major restorative care completed all recommended treatment items, compared to 33 percent ( $p < 0.01$ ) of those who required basic restorative treatment.

Table 8 shows the relationship between patient status and the percentage of treatment plan items completed. Overall, established patients completed higher percentages of treatment in each category. The largest difference can be seen among those completing none of the treatment plan items, as thirty-two percent of new patients failed to complete any treatment, compared to only twenty-one percent of established patients.

Table 8

*Patient Status by Percentage of Treatment Plan Items Complete*

Patient Status	0%		Less than 50%		50% to 99%		100%		Total	
	N	%	N	%	N	%	N	%	N	%
New	108	32.2	44	13.1	26	7.8	157	46.9	335	100.0
Established	27	20.6	27	20.6	13	9.9	64	48.9	131	100.0
Total	135	29.0	71	15.2	39	8.4	221	47.4	466	100.0

Chi-Square=8.455 df=3 p=.037

Table 9 shows that there is not a statistically significant relationship between age and the percent of treatment plan items completed for patients at the Good Neighbor House.

Table 9

*Percentage of Treatment Plan Completion by Age Group*

Age Group	0%		Less than 50%		50 to 99%		100%		Total	
	N	%	N	%	N	%	N	%	N	%
18 to 25	27	18.4	30	20.4	28	19.0	62	42.2	147	100.0
35 to 49	36	23.2	21	13.5	35	22.6	63	40.6	155	100.0
50 to 82	35	22.0	16	10.1	30	18.9	78	49.1	159	100.0
Total	98	21.3	67	14.5	93	20.2	203	44.0	461	100.0

Chi-Square=8.796 df=6 p=.186

Table 10 shows that there is not a statistically significant relationship between age and the percent of treatment plan items completed for patients at the Good Neighbor House.

Table 10

*Race by Percentage of Treatment Plan Items Complete*

Race	0%		1%-49%		50%-99%		100%		Total	
	N	%	N	%	N	%	N	%	N	%
White	54	20.0	39	14.4	52	19.3	125	46.3	270	100.0
Black/Other	45	25.3	28	15.7	43	24.2	80	44.9	178	100.0
Total	99	21.2	67	14.4	95	20.4	205	44.0	466	100.0

Chi-Square 2.193 df=6 p=0.901

Table 11 shows the total base cost for all services rendered at the Good Neighbor House and the total patient payments for all services performed. Twenty-eight percent (\$34,149) of the base cost of all procedures (\$122,952) based on Medicaid reimbursement rates were recovered in the form of patient payments. These values were used to calculate an individual average cost per patient who received care. The average base cost per patient was \$333.20. The average amount paid by each patient for dental services received at Good Neighbor House was \$93.



Table 11

*Base Costs vs. Patient Payments*

Base Costs	\$122,952
Patient Payments	\$34,149
Percent Fee Recovery	27.8

Table 12 shows the percent of base cost paid by severity level of treatment. Of those who received preventive dental care services, half paid less than 50 percent of the base cost. Sixty-four percent of patients who received basic restorative care and major restorative services paid less than 50 percent of the base cost of their treatment.

Table 12

*Percentage of Base Cost Paid by Treatment Severity Level*

Severity	1%-24%		25%-49%		50%-74%		75%-100%		Total	
	N	%	N	%	N	%	N	%	N	%
Preventive	1	2.6	18	47.4	3	7.9	3	7.9	25	100.0
Basic Restorative	43	35.0	35	28.5	8	6.5	7	5.7	93	100.0
Major Restorative	108	35.4	88	28.9	42	13.8	19	6.2	257	100.0
Total	152	32.6	141	30.3	53	11.4	29	6.2	375	100.0
Chi-Square	28.083	df=8	p=0.00							

Only six percent of all dental patients paid 75 percent of base cost or more for the dental care they received at Good Neighbor House.

### Discussion

Stanton and Rutherford (2003) found that minorities, the elderly, and low-income populations, were more likely to have unmet dental needs than Caucasians. This study found no differences in the need for dental care by race or age for the low incomes population that uses the Good Neighbor House for dental care. The ADA (2011) reports that minorities and the poor make up the majority of the patients who use federally-qualified health centers for dental care

services. Good Neighbor House patients during the study year, however, were 57 percent Caucasian/white and 43 percent minorities. The median income for those who reported their annual income to the Good Neighbor House was \$13,296, substantially lower than the federal poverty level of \$15,130 for a family of two.

The Institute of Medicine (2011) reported that low-income populations have a greater tendency to utilize dental care services on an emergency basis because of lack of routine preventive care. Results from the Good Neighbor House support this finding with 229 of the “new” patients (68%) being diagnosed as requiring major restorative treatment. Many of these are patients seeking emergency care for problems stemming from a lack of routine dental care. A review of the clinic’s patient schedules revealed notes stating “emergency visit” as the reason given for patient visits for 107 of the 335 new patients seen during the study year.

The results indicate that the percentage patients at the Good Neighbor House who require only preventive care, though small, were the most likely to complete all items on their treatment plans. When the treatment plan includes only preventive care, it is easier for patients to fully complete treatment as opposed to treatment plans that require more intensive therapies requiring multiple visits. Kelly et al. (2005) identified financial, transportation, and educational barriers to accessing care among low-income individuals, all of which may factor into how much care is ultimately received. There is little research that directly links the diagnosed severity of dental health problems and the completion of treatment with barriers to care, especially in public health clinics.

The Surgeon General when reporting on access barriers to dental care indicates that advancing age often coincides with financial barriers to care (IOM, 2011). Age of patients who utilized the Good Neighbor House clinic for dental care was evenly distributed across age

categories. No relationship was found between patient age and the severity of diagnosed treatment needs or between age and the percent of treatment plan items completed at the clinic. Members of the oldest age group at the Good Neighbor House clinic were no less likely to have incomplete treatment plans than those in younger age groups.

Stanton and Rutherford (2003) identified minorities as one population particularly at-risk for untreated dental needs. There was no relationship was found between race and likelihood of completing treatment plans. Results show that Good Neighbor House minority patients were no more likely than Caucasian patients to have unfinished treatment plan items.

DeVoe, Saultz, Krois, and Tillison (2009) report that children without a “usual source of care” have a greater chance of having unmet oral health care needs. Results from the Good Neighbor House suggest that the same holds true for adults. New patients were 1.2 times more likely to need major restorative treatment than established patients at the clinic. Creating a usual source of dental care, or a “dental home,” relies heavily on establishing trust between patients and care providers. Graham, Logan, and Tomar (2004) found that patients with self-described low levels of trust in physicians and dentists were 54 percent less likely to seek care than those with a high level of trust in physicians and dentists. Given that the results show a relationship between patient status and severity of treatment needs, these findings suggest that maintaining the trust of patients in the clinic and its providers may result in the need for less severe treatment interventions and will ultimately lead to better oral health outcomes for patients at the Good Neighbor House.

The reimbursement rate for Good Neighbor House is based on the Medicaid fee schedule. Patients pay for dental services on a sliding fee scale. Those who choose to pay the full rate are not required to report their income. The average amount paid by those receiving care at Good

Neighbor House was 27 percent of the base rate. The dental clinic delivered nearly \$123,000 worth of services during the study year. This means that each patient would have paid an average of \$333 had they paid the full price of care. Instead, the average patient payment was \$93. Good Neighbor House is meeting its mission of providing care for the underserved.

In many ways, oral health has steadily improving in the United States over the past several decades. However, low-income populations have major deficiencies in oral health status. The perception the individual has of their need for treatment or importance of receiving timely treatment also plays an important role in poor oral health status among low income populations. But oral health disparities are the result, in a large part, to an inability to access dental care services. The key barriers to access to dental care include cost and availability of providers to serve low income individuals needing care. While changing perceptions and behaviors can be difficult and slow to show signs of change, increasing service availability and lowering costs are two elements that are within the control of the public health and dental health communities that would significantly improve access, and in turn, oral health on a large scale.

### **Strengths and Limitations**

Strengths of the study included the use of a large patient pool over an extended period of time. By doing this, a more accurate assessment of safety net dental clinic patients and their needs could be obtained. The Good Neighbor House maintains a thorough patient tracking system, allowing for many patient demographic characteristics to be evaluated along with the severity, completion percentage, and payment percentage variables in the study. Weaknesses of the study included difficulties in individual chart reviews that contained unclear or incomplete treatment plan forms. Handwritten chart notes made by treating dentists were sometimes substituted for information within the treatment plan when treatment plan forms were incomplete

or missing. A more standardized system of documenting diagnosed patient needs and treatment items delivered may assist in any future chart reviews and in the efforts of dental clinic staff delivering the highest quality of care.

### **Public Health Implications**

The chart audit at the Good Neighbor House dental clinic allowed for an in-depth examination of both the needs of the patient population and the clinic's capabilities. One of the most relevant findings to clinical operations was the percentage of fees paid by patients for services. By quantifying the severity of oral health problems within a low-income population, it becomes easier to see what kinds of resources are needed to combat the problem. Showing how limited the clinic's reimbursements are for services with patients paying under 27 percent of the base costs, the need for financial assistance through grants and community aide becomes apparent. Learning how to collect this kind of data and interpret results allows a more targeted approach to patient care. The numbers show that low-income patients require a great deal of restorative care, so clinic staff with this type of expertise should be put into place. Percentage of treatment plan items complete within the patient population is low, so doing things like expanding clinical hours to accommodate patient needs and focusing on oral health education and instruction may help improve the amount of treatment patients receive, ultimately improving their oral and systemic health. As a future health professional in dentistry, studying how a safety net dental clinic operates and being able to offer input on strategies to improve efficiency and patient care will provide me with the tools to be a more effective manager in any health system setting.

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**Appendix 1: Institutional Review Board Approval**

Office of Research and Sponsored Programs  
2011 University Hall  
3640 Col. Glenn Hwy.  
Dayton, OH 45435-0001  
(937) 775-2425  
(937) 775-3781 (FAX)  
e-mail: [rsp@wright.edu](mailto:rsp@wright.edu)

**DATE:** April 3, 2013

**TO:** Ethan Jones, PI, Grad. Student  
Public Health  
Bill Spears, PhD, Fac. Adv.  
Community Health

**FROM:** B. Laurel Elder, Chair   
WSU Institutional Review Board

**SUBJECT:** SC# 5137  
*'Access to Dental Care Among Low-Income Populations'*

At the recommendation of the IRB Chair, your study referenced above has been recommended for exemption. Please note that any change in the protocol must be approved by the IRB; otherwise approval is terminated.

This action will be referred to the Full Institutional Review Board for ratification at their next scheduled meeting.

**NOTE:** This approval will automatically terminate two (2) years after the above date unless you submit a "continuing review" request (see [http://www.wright.edu/rsp/IRB/CR\\_sc.doc](http://www.wright.edu/rsp/IRB/CR_sc.doc)) to RSP. You will not receive a notice from the IRB Office.

If you have any questions or require additional information, please call Robyn Wilks, IRB Coordinator at 775-4462.

Thank you!

Enclosure

RESEARCH INVOLVING HUMAN SUBJECTS

SC# 5137

ACTION OF THE WRIGHT STATE UNIVERSITY  
EXPEDITED REVIEW

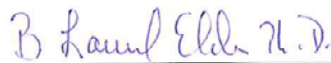
Assurance Number: FWA00002427

Title: 'Access to Dental Care Among Low-Income Populations'

Principal Investigator: Ethan Jones, PI, Grad. Student  
Public Health  
Bill Spears, PhD, Fac. Adv.  
Community Health

The Institutional Review Board Chair has approved an exemption with regard to the use of human subjects on this proposed project.

REMINDER: Federal regulations require prompt reporting to the IRB of any changes in research activity [changes in approved research during the approval period may not be initiated without IRB review (submission of an amendment), except where necessary to eliminate apparent immediate hazards to subjects] and prompt reporting of any serious or on-going problems, including unanticipated adverse reactions to biologicals, drugs, radioisotope labeled drugs or medical devices.



Signed \_\_\_\_\_ Chair, WSU-IRB

Approval Date: April 03, 2013

IRB Mtg. Date: April 15, 2013

**Appendix 2: List of Tier 1 Core Public Health Competencies Met**

<b>Domain #1: Analytic/Assessment</b>
Identify the health status of populations and their related determinants of health and illness (e.g., factors contributing to health promotion and disease prevention, the quality, availability and use of health services)
Describe the characteristics of a population-based health problem (e.g., equity, social determinants, environment)
Use variables that measure public health conditions
Use methods and instruments for collecting valid and reliable quantitative and qualitative data
Identify sources of public health data and information
Recognize the integrity and comparability of data
Identify gaps in data sources
Adhere to ethical principles in the collection, maintenance, use, and dissemination of data and information
Describe the public health applications of quantitative and qualitative data
Collect quantitative and qualitative community data (e.g., risks and benefits to the community, health and resource needs)
Use information technology to collect, store, and retrieve data
Describe how data are used to address scientific, political, ethical, and social public health issues
<b>Domain #2: Policy Development and Program Planning</b>
Describe how policy options can influence public health programs
Explain the expected outcomes of policy options (e.g., health, fiscal, administrative, legal, ethical, social, political)
Gather information that will inform policy decisions (e.g., health, fiscal, administrative, legal, ethical, social, political)
Describe the public health laws and regulations governing public health programs
Incorporate policies and procedures into program plans and structures
Identify mechanisms to monitor and evaluate programs for their effectiveness and quality
Demonstrate the use of public health informatics practices and procedures (e.g., use of information systems infrastructure to improve health outcomes)
Apply strategies for continuous quality improvement
<b>Domain #3: Communication</b>
Identify the health literacy of populations served
Participate in the development of demographic, statistical, programmatic and scientific presentations
<b>Domain #4: Cultural Competency</b>
Incorporate strategies for interacting with persons from diverse backgrounds (e.g., cultural, socioeconomic, educational, racial, gender, age, ethnic, sexual orientation, professional, religious affiliation, mental and physical capabilities)
Recognize the role of cultural, social, and behavioral factors in the accessibility, availability, acceptability and delivery of public health services
Describe the dynamic forces that contribute to cultural diversity
<b>Domain #5: Community Dimensions of Practice</b>
Recognize community linkages and relationships among multiple factors (or determinants) affecting health (e.g., The Socio-Ecological Model)
Identify stakeholders
Collaborate with community partners to promote the health of the population
Identify community assets and resources
Inform the public about policies, programs, and resources
<b>Domain #6: Public Health Sciences</b>
Describe the scientific evidence related to a public health issue, concern, or, intervention
Retrieve scientific evidence from a variety of text and electronic sources
Discuss the limitations of research findings (e.g., limitations of data sources, importance of observations and interrelationships)
Describe the laws, regulations, policies and procedures for the ethical conduct of research (e.g., patient confidentiality, human subject processes)
Partner with other public health professionals in building the scientific base of public health

<b>Domain #7: Financial Planning and Management</b>
Describe the local, state, and federal public health and health care systems
Adhere to the organization's policies and procedures
Report program performance
Contribute to the preparation of proposals for funding from external sources
<b>Domain #8: Leadership and Systems Thinking</b>
Incorporate ethical standards of practice as the basis of all interactions with organizations, communities, and individuals
Describe how public health operates within a larger system
Identify internal and external problems that may affect the delivery of Essential Public Health Services
Use individual, team and organizational learning opportunities for personal and professional development
Participate in the measuring, reporting and continuous improvement of organizational performance