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The influence of community support services in reducing potentially preventable readmissions

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Abstract

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by

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M.B.A., University of Missouri in St. Louis, 1980

M. A., Webster University, 1978

B.B.A., University of Texas, 1975

Dissertation Submitted in Partial Fulfillment

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Abstract

Recently, the Centers for Medicare and Medicaid Services (CMS) ranked all hospitals based on Medicare readmission rates for heart attacks, heart failure, and pneumonia. CMS offered subsidies to hospitals ranked in the 4th quartile to develop community support services to reduce the problem of potentially preventable readmissions (PPRs). CMS cited 4 of the 5 hospitals in Prince George's County in the 4th quartile. The purpose of this quantitative research study was to investigate the relationship between community support services and the reduction of PPRs in Prince George's County. The Evans and Stoddart field model of health and well-being guided this study with support from Bertalannffy's general systems theory. This study sought to relate community support services to PPRs in Prince George's County in contrast to other Maryland counties. To evaluate relationships between community support services and the reduction of PPAs, secondary data were provided by CMS in conjunction with the Robert Wood Johnson Foundation and the University of Wisconsin. The data included 26 behavioral community support factors from 53,229 Medicare paid claims in Maryland residents from July 1, 2008 to June 30, 2011. Lack of diabetes screening is a community support factor within quality of care. Using multiple regressions, there was a statistically significant relationship found between diabetic screenings and pneumonia readmission rate. The implication for social change is that reimbursement of key screening recommendations to CMS, local government, and hospitals in Prince George's County may reduce readmission rates, thereby positively affecting patients, improving community health, and decreasing health care costs in Prince George's County.

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Dedication

To my family, I owe so much. They allowed me to focus on this subject so a quality research project would add to the common body of literature on the prevention of unnecessary readmissions. In addition, thanks to my friends and colleagues who read drafts and provided advice in the development of this topic.

Acknowledgments

Thanks to the members of my committee. My Chairman, Dr. Lori Demeter, assisted me in developing a quality research study, Dr. Raj Singh provided guidance on the methodology, and Dr. Kirk Williams offered improvements to ensure the paper added to the common body of knowledge. I want to thank Dr. Sarah Hart, my first Committee Chairman, who assisted in the design that was appropriate for a dissertation. Finally, I want to thank Wendy LaRue and Timothy McIndoo, who served as my editors.

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Chapter 1: Introduction

Introduction

Potentially preventable readmissions (PPRs) occur when patients lack medical and infrastructure support to help them manage their illnesses from their homes (Goldfield, 2008). Previous studies focused on PPRs that are costly to the health care system and that represent a lack of quality in the continuum of care (Berwick, Nolan, & Whittington, 2008; Goldfield, 2008; HSCRC, 2011b; Vest, Gamm, Oxford, Gonzalez, & Slawson, 2010). Vest et al. (2010) concluded that high-risk patients included those patients with poor health, fragility, comorbidities, increasing severity, and high previous utilization. Goodman, Fischer and Chang (2011) were the first scholars to study issues surrounding coordination of care for these high-risk patients discharged from hospital to community following an acute or chronic stay. Since 2008, the Centers for Medicare and Medicaid Services (CMS) has joined with leaders in the health care system to reduce PPRs for high-risk Medicare patients, to increase their quality of care, and ultimately, to reduce unnecessary expense (CMS, 2011d).

Background of Study

To reduce the unnecessary costs of PPRs, Medicare now denies payments on readmissions within 24 hours of discharge for a clinically related diagnosis (Jencks, Williams, & Coleman, 2009). The Medicare Payment Advisory Committee's report (*Medicare Payment Advisory Commission Report to the Congress: Reforming the delivery system: A path to bundled payment around a rehospitalization*, June 2008) to Congress on the 2005 rehospitalization data documented that rehospitalizations for

Medicare recipients during the first 30 days after discharge accounted for nearly 18% of all Medicare admissions. In a 2008 state-specific study, Goldfield (2008) found that 11.03% of the clinically linked readmissions that occurred within 30 days were potentially preventable and suggested that the shorter the interval from discharge to readmission, the more likely the readmission was potentially preventable. CMS suggested that the fewer readmissions, the less costly Medicare would be, and the greater overall improvement of the patient's satisfaction (CMS, 2011c). Using 2004 data, it was documented that readmissions cost the Medicare program an estimated $17.6 billion (Jencks et al., 2009). Further defining of costs and quality associated with PPRs should be examined using national data, Maryland data, and Prince George's County data.

Each rehospitalization comes with a chance of injury or complication, such as "object left in surgery, air embolism, blood incompatibility, catheter-associated urinary tract infection, decubitus ulcers, vascular catheter-associated infection, surgical site infection—mediastinitis after CABG and falls under specific trauma codes" (Keefe, 2008, para. 5). Fewer PPRs can reduce the number of injuries and complications (Keefe, 2008). The Institute of Medicine reported that, nationally, 98,000 deaths due to preventable medical errors occur annually in the United States (CMS, 2011c) and implied that poor quality was associated with some hospitalizations (Goldfield, 2008; Keefe, 2008). In 2011, CMS planned the implementation of the Partnerships for Patients program that was estimated to save $35 billion for patient care, including up to $10 billion for Medicare beneficiaries, by stopping preventable injuries and complications for 60,000 American lives over the next 3 years; a 40% decrease over 2010 data (CMS,

2011c). CMS expected a savings of $50 billion for Medicare if it implemented the partnership program with the hospitals and their communities to reduce PPRs, preventable injuries, and preventable complications (CMS, 2011c). The Partnership for Patients program had another goal: to reduce readmissions by 20%, which would mean that 1.6 million patients would not be readmitted within 30 days of discharge (CMS, 2011c). The number of Medicare readmissions in 2005 through 2009 remained constant at 20%, with only some states achieving a reduction. Approximately 2.6 million beneficiaries cost more than $26 billion a year (Goodman, Fisher, & Chang, 2011). New programs that encouraged the patient, the hospital, and the community to improve the continuum of care were the goal of the partnership program. Additionally, Congress allocated $1 billion in the Affordable Care Act (ACA) to meet the goals of keeping patients from injuries and complications, and improving transitions between care settings (CMS, 2011c).

In December 2010, CMS rolled out a new program to help reduce the readmissions by improving the transition between care settings. The program, called Community-based Care Transitional Program (CCTP), had "$500 million in funding to community-based organizations partnering with eligible hospitals for care transition services that include timely, culturally, and linguistically-competent post-discharge education, medical review and management, and patient-centered self-management support within 24 hours of discharge" (CMS, 2011c, para. 20). CMS began accepting applications as of April 2011. Due to the complexity of the application, in August 2011 CMS contracted with quality initiative organizations (QIOs) to assist applicants in

acquiring funding (Janet Jones, personal communication, September 23, 2011). An understanding of Prince George's County's CMS results may help to further describe why this study is necessary to reduce readmissions.

Prince George's County Hospitals

A further examination of PPRs' costs in Maryland identified by HSCRC staff, using Jencks' CMS estimation model, indicated that Maryland's cost for PPRs could be between $360 million and $650 million annually (HSCRC, 2011c; Jencks et al., 2009). In the state of Maryland, there are nine hospitals in the CMS fourth quartile of hospitals with high readmissions. These hospitals are eligible for participation in the CCTP funding to help improve the care transitions for the county's high-risk Medicare beneficiaries (CMS, 2011b). Four of the five hospitals in Prince George's County are eligible for participation: Doctors Community Hospital, Fort Washington Hospital, Prince George's Hospital Center, and Southern Maryland Hospital (CMS, 2011a, 2011b). With four of the five of the hospitals in Prince George's County accounting for the highest PPRs, it can be estimated that 25 % or greater of Maryland's costs for PPRs reside in one county, namely, Prince George's County.

An avoidable or preventable readmission is one that is considered clinically related to the previous admission and could have been prevented by improved hospitalization processes; appropriate discharge planning; and post-discharge follow-up with coordination among inpatient and outpatient teams, which include providers of care, the patient, the family, and the community (CMS, 2011d; Goldfield, 2008). The literature shows that there are multiple players and factors in reducing readmissions. It is clear that

working through the hospital is a means towards this end, whether or not the majority of the issues are the hospitals' responsibility (Vest et al., 2010). For example, because four of the five hospitals in Prince George's County in the state of Maryland are on the CMS fourth quartile list of high readmissions, further examination of contributing factors is warranted. Types and levels of factors in the community might have caused a high readmission rate in four of five Prince George's County hospitals. CMS goals focused on reducing avoidable hospital readmissions to reduce negative health outcomes and to positively increase levels of safety and quality of care provided (CMS, 2011d). The well-being of the citizens of Prince George's County is of public concern and the heart of this research study.

Population at Risk

The citizens and officials of Prince George's County face the fiscal constraints and challenges of a diverse population, both ethnically and socioeconomically, while ensuring the health and well-being of county residents (Lurie et al., 2009). The CCTP identified the need to be beneficiary-friendly while offering appropriate linguistic and culturally friendly services. One identified reason that four of the five hospitals in Prince George's County are on the CMS list of high readmissions is lack of diversity training and service modification to meet the community's needs (Lurie et al., 2009).

In studying the county's demographic and health characteristics, two significant points come into view: (a) ethnic and socioeconomic diversity, and (b) a high proportion of residents working outside the county with high commute times (Lurie et al., 2009). The issue of commuting could be important when studying the time caregivers need to

work with their elderly parents' medical needs. When the family does not participate in helping the elderly meet outpatient appointments, then the care transition from inpatient to outpatient care could result in a PPR. In addition to demographic and health characteristics, Lurie et al. identified other barriers to access of care.

The Lurie et al. (2009) study described two other barriers to access: (a) a low level of primary care physicians and (b) a high level of uninsured as compared to the surrounding catchment areas. Lurie concluded that the county did not have adequate safety nets for the uninsured, but did have adequate hospitals and emergency rooms. These results suggest reasons for more frequently per capita emergency room utilization as compared to neighboring counties (Lurie et al., 2009). Goodman et al. (2011) documented higher than normal readmissions, due to the use of the emergency rooms between admissions to handle chronic or acute episodes. As Goodman et al. documented, the use of emergency rooms substituted for the lack of primary care physicians for the uninsured. The payments to hospitals for emergency room visits for the uninsured are not an issue to patients because they must be seen regardless of payment ability, which is another factor in high potential readmissions in Maryland hospitals.

Maryland hospitals are compensated for all services provided to the uninsured through an increase in their allowable charges, so there is no financial incentive to encourage patients to visit their primary care physicians instead of returning to the hospital's emergency room (HSCRC, 2011a). Also patients in Prince George's County may be constrained in visiting their primary care physicians after a hospital stay because of the lack of community support services as compared to neighboring counties (Lurie et

al., 2009). Typical community support services include adequate transportation alternatives, pharmacies, primary care offices, diabetes screenings, and programs to aid families in the care of children and the elderly. Besides the five available emergency rooms, two clinics and a federally qualified health center (FQHC), Greater Baden Medical Services, Inc. (GBMS) served more than 80,000 uninsured patients in Prince George's County (Lurie et al., 2009). This study identified issues with access, demographics, and health characteristics that accounted for the lack of adequate health care services for the residents of Prince George's County (Lurie et al., 2009).

The Lurie et al. (2009) study presented much data about the citizens and the health care providers of Prince George's county and related demographics. The report did not discuss PPRs. This research study attempted to build upon the Lurie et al. study by examining trends in the types and levels of community support services—data that could indicate why four hospitals in Prince George's County are high-risk PPR hospitals and eligible for CCTP funding.

Problem Statement

In Prince George's County of Maryland high-risk Medicare beneficiaries are being readmitted to hospitals at a higher rate than the state's average (CMS, 2011d). CMS found that PPRs for Medicare recipients are more costly than the cost of treating the patients on an outpatient basis, and resulted in poorer patient outcomes (CMS, 2011d). CMS offered subsidies under the ACA, section 3026 of P.L. 111-148, to those hospitals with extraordinary PPR rates in order to encourage them to develop community-based care transitions programs and thus reduce PPR rates (CMS, 2009). CMS identified

nine Maryland hospitals as facilities with extraordinary PPR rates, of which four are in Prince George's County (CMS, 2011b).

This problem of readmissions in Prince George's County affects the cost of healthcare when the patient uses expensive emergency room and inpatient treatment options to regulate chronic, treatable outpatient ailments, such as diabetes or renal failure (Goodman et al., 2011; Lurie et al., 2009). Lurie et al. identified some types and levels of community support services, such as lack of primary care physicians, overuse of emergency rooms, and illiteracy rates, which distinguish Prince George's County residents' health status from other Maryland counties. There are many possible types and levels of community support services, as seen in Table 1, that are continually gathered by county health rankings (Robert Wood Johnson Foundation & Institute, 2011); they could also contribute to the population health status and thus lead to the PPR problem in Prince George's County. The literature has shown that these four variables may apply to a county's PPR problem: (a) ineffective patient education upon discharge (Goldfield, 2008; Goodman et al., 2011), (b) lack of outpatient drug prescriptions and providers (Goldfield, 2008), (c) inadequate community support services (Goldfield, 2008), and/or (d) patient's inability to comply with directives (Goldfield, 2008; Goodman et al., 2011).

Lurie et al. (2009) identified illiteracy as an issue in Prince George's County, a variable for PPRs identified by Goldfield (2008) and Goodman et al. (2011). The current literature that identified these four variables did not link the variables to readmissions; however, using the county health rankings (Robert Wood Johnson Foundation & Institute, 2011) data and assigning the categories of that model into the four variables

presented by Goldfield could identify variables that affect readmissions. Another study by Graham (2009) identified the lack of effective education upon discharge—for both patient and caregivers—which caused health problems, including, but not limited to, PPRs. Literature has linked some of the community variables, such as literacy, lack of primary care physicians, overuse of emergency rooms, and lack of adequate training of caregivers, to PPRs.

The need to study the specific problem of why patients in Prince George's County are readmitted more often than in other Maryland counties exists so that the Prince George's County hospitals can reduce the PPR rates thus reducing healthcare costs and improving patient outcomes for the county residents. This quantitative study is expected to contribute to the body of knowledge of how to reduce PPR rates in the State of Maryland, in particular these four hospitals in Prince George's County. By investigating the similarities and differences in the types and levels of community support services affecting the readmission of patients at these four hospitals, changes could be made at the hospital, county, and patient level, changes that could reduce the cost of PPRs and improve the health experiences for patients.

Purpose of the Study

The purpose of this quantitative research study was to determine if there was a relationship between PPRs and the types and levels of community support services in Prince George's County as compared to other counties in Maryland. The focus was on preventable readmissions , thus reducing adverse patient outcomes and financial waste (Goldfield, 2008). Administrative data was used in Goldfield's study that pointed to

PPRs and their affect on the quality of care provided during hospitalizations. CMS approached the PPR issue with this same focus, one of reviewing the quality of care within the care continuum starting with the hospitals.

> Hospitals have traditionally served as the focal point of efforts to reduce readmissions by focusing on those components for which they have direct responsibility, including the quality of care during the hospitalization and the discharge planning process. However, it is clear that there are multiple factors along the care continuum that impact readmissions, and identifying the key drivers of readmissions for a hospital and its downstream providers is the first step towards implementing the appropriate interventions necessary for reducing readmissions. (CMS, 2011d, p. 3)

Nature of Study

This quantitative study used secondary data to determine the correlation between the types and levels of community support services in Prince George's County and PPRs. The population for this study came from CMS's 2010 claims data on PPRs and the 2013 demographic data from the county health rankings data (CMS, 2011b; Robert Wood Johnson Foundation & Institute, 2011). If a lack of adequate community-based care services can cause high PPR rates, then it is possible to develop appropriate care transition programs with the goals of reducing PPRs while offering a beneficiary-friendly environment (CMS, 2011d).

To answer the research question and subquestions, this study used a nonexperimental correlation research design (Salkind, 2010). I chose a nonexperimental

design because I was not manipulating the secondary data but rather exploring relationships. The specific community support services per county—the independent variables—were matched with the PPR rates per county, the dependent variable. The *t* test regression analysis was calculated for each county in Maryland to see if a correlation will exist between services and PPR rates. The one-way analysis of variance (ANOVA) and *t*-value with probability or *p*-value were calculated between Prince George's County and the other Maryland counties to test significance of findings or in other words that the correlation was not a chance finding (Trochim & Donnelly, 2008). If the results do not support one or more null hypothesis, then this study would have supported the hypothesis that PPRs are affected by one or more of the four research subquestions.

The focus of this research study was on the county health-related support programs that could result in a reduction of PPR rates. Studying the relationship between types and levels of services offered in Prince George's County is expected to identify why Prince George's County has four hospitals in CMS's PPR report. This study provided data that can be used in understanding these factors throughout Maryland as well as other U.S. counties with similar characteristics. The detailed discussion about methodology appears in Chapter 3.

Research Question and Hypotheses

This research was designed to investigate the relationships between the types and levels of community support services and PPR rates. PPRs were derived from the CMS claims data and community support services using three of the four categories of the

county health rankings data (see Table 1). This study was based on five research questions, each of which generated related hypotheses:

The primary research question asked how the community support services affected the levels of PPRs differently for Prince George's County than for other counties in Maryland. The five subquestions are as follows:

RQ1: Does the county health rankings' quality of care reported data on ineffective patient education upon discharge affect PPRs?

H_1^0: County health rankings' quality of care reported data on ineffective patient education upon discharge do not affect PPRs.

H_1^A: County health rankings' quality of care reported data on ineffective patient education upon discharge do affect PPRs.

RQ2: Does the county health rankings' access to care reported data on the lack of outpatient drug prescriptions and providers affect PPRs?

H_2^0: County health rankings' access to care reported data on the lack of outpatient drug prescriptions and providers do not affect PPRs.

H_2^A: County health rankings access to care reported data on the lack of outpatient drug prescriptions and providers do affect PPRs.

RQ3: Does the county health rankings' social and economic factors reported data on the lack of inadequate community support services affect PPRs?

H_3^0: County health rankings' social and economic factors reported data on the lack of inadequate community support services do not affect PPRs.

H_3^A: County health rankings' social and economic factors reported data on the lack of inadequate community support services do affect PPRs.

RQ4: Does the county health rankings' health behaviors reported data on patient's inability to comply with directives affect PPRs?

H_4^0: County health rankings' health behaviors reported data on patient's inability to comply with directives do not affect PPRs.

H_4^A: County health rankings' health behaviors reported data on patient's inability to comply with directives do affect PPRs.

RQ5: Do all of the variables together (county health rankings' data on ineffective patient education upon discharge, lack of outpatient drug prescriptions and providers, the lack of inadequate community support services, and the patient's inability to comply with directives) affect PPRs?

H_5^0: County health rankings' data on ineffective patient education upon discharge, lack of outpatient drug prescriptions and providers, the lack of inadequate community support services, and the patient's inability to comply with directives do not affect PPRs.

H_5^A: County health rankings' data on ineffective patient education upon discharge, lack of outpatient drug prescriptions and providers, the lack of inadequate community support services, and the patient's inability to comply with directives do affect PPRs.

Theoretical Framework

The foundation for this research required consulting current theory on collaboration among the players involved in the continuum of care. It is through collaborative activities that an improved model of health care delivery can be established (Evans & Stoddart, 1994). A study of theories on systems and the public-private collaboration showed that, without collaboration, the health care industry cannot receive the funding to offer the care transition programs recommended in the ACA. The patient, the service providers, and the community support systems are all part of the ACA and require collaboration to achieve the goals of the ACA. Adding to this area of current knowledge about collaborative theories are theories summarized by Shafritz, Ott, and Jang (2005) and Tompkins (2005), and identified in Systems Theory (2004); Bertalannffy (1972); Donabedian (1988); and Evans, Barer, and Marmor (1994).

The theoretical framework is categorized into three sections to review the current body of knowledge. The first section describes the delivery of healthcare using the structure-process-outcome model that influenced the development of the quality health outcomes model (Donabedian, 1988; Mitchell, Ferketich, & Jennings, 1998). The second section builds on the quality model and describes the open systems model of healthcare delivery using Bertalannffy's (1972) general systems theory (GST). The third section moves one step forward towards an interactive multi-dimensional model; it is described by Evans and Stoddart (1994) as the field model of health and well-being that constitutes the conceptual framework for this study.

Quality Health Outcomes Model

During the review of literature on the health care delivery system, the basic model of structure-process-outcome was presented (Donabedian, 1988; Mitchell et al., 1998). The attempt to form linkages between health care delivered and quality began with this basic model. The structure is the place of service delivery; the process includes the activities performed by the patients and providers; and the outcomes are the results of the services provided on the patients' health status (Donabedian, 1988; Mitchell et al., 1998). This basic model appears to be a linear, one directional, individual approach toward improved health status (Donabedian, 1988). The concept is that with proper places of service, the right professionals, and patient interactions that the health status of the individual will improve. The model failed to consider complex multi-directional interpersonal relationships between structure, processes, and outcomes or the levels of linkages among the three components. Despite this shortcoming, during the past decades, since the development of quality health outcomes model, studies have used this model to expand relationships in behaviors and clinical activity, such as eating behaviors, nursing care and patient responses, nursing care and quality, and other services provided to patients by providers.

Donabedian (1988) took the traditional linear model of structure-process-outcome and formulated the dynamic quality health model which includes two-directional relationships among the system, the clients, the care provided, and the interventions. In this quality health outcomes model, the client is the patient, the family, and the community. The community is only at play in relationship to the individual who is the

focus in this model. Donabedian's model concerning quality outcomes has moved toward the multidirectional individual approach but has lacked the focus on how the population's health status can be improved.

This study's focus was on preventable readmissions and the opportunities for the community support factors to help in reducing these readmissions. For an accurate focus on preventable conditions, a multidirectional community focus is required of the conceptual framework. A review of the body of knowledge on multidirectional community focused systems will be presented in the next section.

Open Systems Model of Healthcare Delivery

Appendix A, A Theoretical Framework: Care Continuum Delivery Model, identifies the open system that services the patients through a corresponding multidirectional relationships among all the players, with interactions within the environment for survival and prosperity (Bertalannffy, 1972). A closed system is one in which the parts have relationships and arrangements that connect them into the pattern that solves the societal problem (Bailey, 2001). Building upon this closed system definition, the health care continuum delivery model also experiences influences from its environment: the public, interest groups, politics, and the media (McKinnon, 2009). These influences change the health care continuum from a closed system to an open system. In the case of health care, once Congress passes the laws, the regulators write the rules for implementation, and the hospitals and other providers serve the public, community support services begin to take a role to serve the public forming the open

system that needs nurturing to be efficient. These congressional laws, for examples laws associated with quality of services, will affect the government and the private insurers.

Using the open health care theoretical model, this study's research design began to develop based on systems theory, in particular the general systems theory (GST) (Bertalannffy, 1972). Shafritz et al. (2005) offered an historical approach to organizational theories with their collection of the masters' works which support the care continuum delivery model. The review of general systems theory elucidates that within the open system of health care delivery of services is an understanding that the environment can affect the continuum of care, accurately describing the health care system as an open system.

Bertalannffy (1972) defined the system as general structures from different disciplines that have predictive values. The forces of nature result in relationships that can introduce special system conditions. In the case of the continuum of care, general systems theory brings into play the government, the reimbursement methods, providers, patients, families, and community support systems that are each different disciplines, which results in a predictive value for the general structure.

General systems theory describes the health care continuum. Although in the delivery of services there is an appearance of a closed system among government, providers, and patients; in reality it is an open system with interdisciplinary activities among the government, the reimbursement methods, the service providers, the patients, community support systems, and the environment (Stevens, 2008). In order for the health care continuum to function in our society, Stevens suggested that the movement of

payment for services must occur. Federal legislators and local community leaders play a role in the access of health care services when writing and implementing rules that include reimbursement for services (J. Anderson, 2006).

Legislators compose legislation to support the health and well-being of their constituents (Oberlander, 2009). The composition of legislation is with assistance from the legislators' personal staffers who compose the law, and the committees and the Congressional institutional staff who assist in documenting the needs of the constituents and the fiscal figures of the proposed law (J. Anderson, 2006). Several other secondary players in the development of policies include the executive branch, media, special interest groups, the court system, research organizations, individuals, and political parties (J. Anderson, 2006). These secondary players are the environment, which again leads us to see that the GST best describes the health care model. The reasonable payments, such as Medicare, Medicaid and commercial insurance carriers, are a key financial component of the health care system's stability (Orszag, 2010). The CCTP was an attempt by the legislature to compensate community providers during a demonstration period to show how Medicare beneficiaries can benefit from new community and hospital programs as of yet not considered covered by insurance or Medicare (CMS, 2011d). The CCTP funding program was a step in this direction of keeping the seemingly closed system of delivery of services in balance with the open system of the continuum of care.

Collaborative results in the health care industry require an understanding of leadership roles for all the public and private players in the open system of the continuum of care as seen in the care continuum delivery model in Appendix A (Topolewski, 2008).

The legislative health care process is an open system because the players' motives, the resources, and the process tools in policy formation and implementation of law are components from one or more of the players in this system, as well as its environment. To be an open system, according to Bertalanffy (1972) and Shafritz et al. (2005) players would seek information and resources from outside the system, offer collaboration to outside players to improve the system, and focus on the society versus individual. In the CCTP model, not all players are part of the closed system for the delivery of health care since the continuum of care must involve others in the environment to prosper as suggested in GST (CMS, 2011d). In the open system, using the GST, the parts of the closed health care delivery system link the environment and community support services resulting in an effective continuum of care that improves outcomes and reduces costs (CMS, 2011c).

In the case of the open system or care continuum delivery model, to be successful, the players in the environment must accept that each have different motives. In addition, each player rules over different levels of resources to accomplish the best legislative design to resolve the public problem for the continuum of quality health care at a reasonable cost for all citizens (Robbins & Davidhizar, 2007). Efficiencies and effectiveness can result when collaboration exists in the open system that leads towards mutually agreed upon efficiencies of scarce resources (Pressman & Wildavsky, 1984).

In summary, the theoretical framework based on a general systems theory (GST) allowed two factors to be studied, namely, the PPR rates and the types and levels of community support services. The first factor, the PPR rates, included such actions as

adequate linguistic and cultural communication with the patients before discharge to minimize rehospitalization. The second factor, the types and levels of community support services, included patients, their families, the county services, the community private services such as pharmacies, and the other providers of services. In this open system, these two factors influenced an effect on the continuum of quality care to the patient (CMS, 2011c).

In the body of literature, a model that focused on the general systems multidimensional, community based delivery of health care was formulated by Evans and Stoddart (Evans & Stoddart, 1994) and continues to be cited by scholars in studies relating to the delivery of health care. The Evans and Stoddart model will be the guiding conceptual framework for this study.

Conceptual Framework Guided by the Evans and Stoddart Field Model of Health and Well-Being

This section will describe the model used as the guiding theoretical framework in the understanding of research questions presented in this study. The structure-process-outcome model, the quality health outcomes model and the GST are the basis for the selection of the Evans and Stoddart field model of health and well-being (1994). The field model of health and well-being (Appendix C) described a population health conceptual framework that provided "meaningful categories in which to insert the various sorts of evidence that are now emerging as to the diverse determinants of health, as well as to permit a definition of health broad enough to encompass the dimensions that people – providers of care, policymakers, and particularly ordinary individuals – feel to be

important" (Evans & Stoddart, 1994, p. 32). In other words, this field model of health and well-being provides the broad theoretical framework for understanding the health in the community, not just for the individual as seen in the quality health outcomes model. Evans and Stoddart stated that their analytic tool was an interactive model in which there was interplay among community factors, as is suggested in this study of preventable readmissions in Prince George's County and other counties in Maryland. A description of the Evans and Stoddart field model of health and well-being is included in this paper to support the understanding of how this model supports the conceptual framework of the study.

The social environment incorporates linkages among family structure, social and educational systems, and levels of prosperity (Weissman, 1996). The physical environment is synonymous with the patient's living location including transportation and communications. The genetic endowment plays an important role because not all disease management activities can change genetic medical problems, such as cystic fibrosis.

Health care and disease are two environments that were seen in the quality health outcomes model, which describes the basic treatments of illness between the practitioner and the patient. The health and function, per Evans and Stoddart (Weissman, 1996), encompasses the patients' personal perspectives on the absence of illness's affects in their lives. Individuals' responses are the behavior and the biology of the individuals, such as those factors that the individuals do that affect their well-being such as smoking, exercising, and dietary practices.

The prosperity reflects the individual's social class and the community's performance both fiscally and on a macro-economic decision-making level. The well-being encompasses the quality of life per Evans and Stoddart (1994), not just the health. CMS's guidelines also describe the care of the elderly, to include well-being in the community, as a component in the delivery of health care.

Evans and Stoddart's (1994) field model helps in conceptualizing components affecting health status. In particular for this study, it helps in conceptualizing the relationships that might occur in counties that result in more preventable readmissions. The Field Model of Health and Well-Being does not attempt to understand why the interactions occur among the different components (Weissman, 1996), just that each component has a relationship with health status. This study was an effort to research the existence of relationships between communities and preventable conditions, not to understand why the interactions exist.

This study included an examination of the relationships in Prince George's County that could be the reasons that four of the five hospitals in the county are on CMS fourth quartile of readmissions in the nation. The field model of health and well-being will be the guiding conceptual framework in this study's attempts to identify components of health status for the communities.

Definition of Terms

The terms in this study associated with health care reimbursements and accounting for fiscal results are as follows:

Affordable Care Act: Federal legislation to improve upon the beneficiaries' experiences to improve the quality of care and reduce the cost of delivery (CMS, 2011d).

Care continuum: The delivery of care from the hospital to all other levels of service such as nursing homes, hospices, primary care providers, caregivers, and other outpatient services (Stevens, 2008).

Centers for Medicare and Medicaid Services: Centers for Medicare and Medicaid Services (CMS), which was previously named HCFA, is currently named CMS (N.A., 2010).

Determinants of health: "A range of personal, social, economic, and environmental factors that influence health status" ("Determinants of Health," 2011, p. About).

Fourth quartile: With the ranking of data, the fourth or lowest quartile is the top 25% of participants in the study. In this study, the CMS fourth quartile are the top 25% of hospitals with the highest readmission rates (CMS, 2011b).

Health Services Cost Review Commission (HSCRC): The Commission appointed by the Governor of Maryland to have oversight over inpatient and hospital- related services (HSCRC, 2011a).

High-Risk Medicare: Patients with Medicare insurance who have poor-health, are fragile, have co-morbidities, have increasing severity, and had previous utilization of services (Vest et al., 2010).

Medicare: Insurance provided by CMS for 65-year and older renal failure eligible United States citizens (Das, 2008).

Medicaid: Insurance provided to specific patients whose income levels fall near the poverty level, depending upon the state's program, which is partially funded by the federal government (CMS, 2005; Ku & Coughlin, 1995).

Outcomes: A term of art used in health care to describe the patient's health care status after an intervention by a provider of services to improve upon the patient's health (Burton, Weiner, Stevens, & Kasper, 2002).

Potentially preventable readmissions: (PPR) "A hospital readmission" is when a patient, who has recently been discharged from a hospital (within 30 days), is once again readmitted into a hospital" (CMS, 2012). A PPR has a reasonable expectation of preventability of "one or more of the following: (1) the provision of quality care in the initial hospitalization, (2) adequate discharge planning, (3) adequate post discharge follow up, or (4) improved coordination between inpatient and outpatient health care teams" (Goldfield, 2008, p. 76).

Rehospitalization: Another term used to mean a potentially preventable readmission, the time between the initial discharge and its clinically related readmission (Goldfield, 2008).

Subsidies: Moneys allowed by law to be given to hospitals or other industries based on rules, and not based on patient claims to third-party payers (Hsieh, 2010).

Triple aim: Centers for Medicare and Medicaid Services has developed three goals— improved health care experience, improved community health, and reduced cost per capita—around which all their programs are being redesigned (Berwick et al., 2008).

Types and levels of community support services: Community services are the behavioral factors presented in the county health rankings. Each service is a type of service, and the quantity of service provided is the level (Robert Wood Johnson Foundation & Institute, 2011).

Assumptions

For this study, I assumed the secondary data presented were accurate for each county. I also assumed the tools I used have a relevance to all the support systems offered in each county, for example that the county health ranking factors could relate to the three CMS diagnosis. Another assumption is that the governmental databases chosen for this study were both controlled in the collection of data and then accurate in the summary of the data reported. The theoretical framework employed, as seen in Appendix C, is based on the assumption that all players are providing timely and accurate data. There may be fraudulent billings to CMS (Raybum, 1992). It must be assumed that the fraudulent activity in Prince George's County is not different from other counties in Maryland or the United States because the claims data are important to the documentation of outpatient activity after an initial admission.

To reduce the risk of bias, as recommended by Wright, Manigault, and Black (2004), I acknowledge that I am an employee at one of the county hospitals (see CV). To reduce this potential bias, I shared this paper with a quality-focused HSCRC employee who is familiar with the county and PPR goals of CMS.

Limitations

This study was subject to two limitations. One limitation was the timeliness of the data. To reduce this potential weakness, I used the most current CMS data at https//www.cms.gov and county health rankings data at http//www.countyhealthrankings.org. The other limitation was how to interpret the relationships between and among the variables in the community services. There were 27 health outcomes, health factors, and policies and program categories of data within county health rankings. I selected specific categories within the data provided by county health rankings, guided by the literature, which could support the reduction of PPRs.

To mitigate these limitations, I offered a copy of my coded data to a few members of the community-based organization (CBO) to assist in validating my results. I presented my findings to my hospital's executive team to help validate my results. By asking for feedback, I ensured that discrepant data was eliminated (Maxwell, 2005). The data must be understood to be able to interpret their meaning (Trochim & Donnelly, 2008). Through multiple reviews and discussions with others, I attempted to improve the significance of the study by reducing the limitations.

Scope and Delimitations

The scope of this study is outlined in the primary research question, which asked how the community support services affected the levels of PPRs differently for Prince George's County than for other counties in Maryland. Evidenced-based secondary data was selected for the study from CMS on claims paid and county health rankings on health

outcomes, health factors, and policies and programs. Using evidenced based secondary data offered me the opportunity to have rich data to support in my results.

Significance of the Study

The connections between the types and levels of community support services, as documented by governmental websites and literature, reflect on the ability to reduce PPRs when implementing care transition programs through a CBO with CCTP funding. There is an eminent need to reduce the escalating cost of health care while sustaining the quality of care. Identifying associations in the care continuum delivery model to increase quality—while reducing cost, injuries, and complications— will advance knowledge in this discipline of how to reduce PPRs. Analyzing Prince George's County in particular will fill in the gap in the literature. Expanding the study to compare Prince George's County to the counties of Maryland constitutes an additional professional application to the subject of PPRs reductions.

Although a county study on the health care delivery system was ordered by the Prince George's County commissioners, their study did not identify the care transitions that would improve citizens' health care and reduce PPRs (Lurie et al., 2009). CMS identified one factor, PPRs, as a first factor that linked quality outcomes and beneficiary well-being (CMS, 2011c). A study was needed to identify factors in the care continuum delivery model that links the activity during the inpatient stay to the long-term period after the discharge to ensure that the patients can remain in an appropriate care setting, and avoid preventable readmissions. A study was also needed to identify post-discharge community support services that help reduce PPRs and improve patient outcomes. These

identifications can result in potential contributions that advance policy changes that can result in fewer PPRs.

According to CMS, health care outcomes relate to improvements in long-term continuum of care (CMS, 2011d). Funding was necessary for counties to look for programs for improved care (CMS, 2011d). When Prince George's County implements evidenced-based care transition programs, CMS will provide the funding through the CCTP model. In this open health care system, patients and their families, primary care physicians, nursing homes, home health agencies, pharmacies, transportation services, and other community services must acknowledge their part. Being able to identify the associations among the players is critical to ensuring that the right care transition programs are implemented, or else there might be no change in readmissions or even an increase in preventable readmissions (CMS, 2011d).

The key to implementing care transition programs for Prince George's County is to first identify the relevant per capita services provided in the county, the surrounding counties, and the nation. Then the care transition program can be developed with assistance from the other players, including but not limited to Congress, regulators, providers of care, families, patients, and providers of supplies. As CMS mandated, the beneficiary-friendly environment, with quality of care at a reasonable cost, is the desirable product for hospitals throughout the United States and for the four Prince George's hospitals in the CMS report (CMS, 2011a).

The first step towards a comprehensive care transition program to reduce PPRs in Prince George's County was focusing on the implementation of this study's evidenced-

based results as they relates to PPR reduction. A thorough understanding of the readmission issues that affect the four hospitals might offer the players of the health care system the opportunity to reduce PPRs for the targeted audience, Medicare beneficiaries (and perhaps other insured and uninsured patients). CMS (2011d) intended that its CCTP would offer equity in the health care system and avoid having its beneficiaries experience a higher percentage of injuries or complications due to the lack of adequate care transitions from inpatient to outpatient. This study could affect social change in areas of lawmaking to ensure Medicare beneficiaries and perhaps other patients receive the necessary community support services to reduce PPRs.

Summary

The study is concerned with how the community support services affected the levels of PPRs differently for Prince George's County than for other counties in Maryland. I presented background information on how Prince George's County's citizens may be in danger of receiving high-cost, poor-quality health care services at an inappropriate care setting, as compared to 75% of the nation's Medicare beneficiaries (CMS, 2011b). The background showed the CMS history on how CMS identified that quality of care, the care setting, the cost of care, and the beneficiary's health were concerns for the government. Social injustice that may occur because of (a) conditions not resolved during the inpatient stay, (b) poor discharge planning, (c) lack of patient understanding of care protocol, and (d) the lack of an appropriate continuum of care, is shown in the high readmission figures of PPRs. In this chapter, I presented the background, the statement of the problem, the purpose, the research question, definition

of terms, the significance of the study, assumptions, limitations, and scope and delimitations.

Chapter 2 includes a discussion of the examined literature that explains why a reduction of PPRs is critical to improving the health care of the society. Chapter 3 provides an overview of the research methodology and describes its salient components. Chapter 4 focuses on the interpretation and results of my study. Chapter 5 examines the findings, makes recommendations, and offers the study's implications for social change.

Chapter 2: Literature Review

Introduction

The purpose of this research was to examine the influence of community services on the reduction of PPRs in Prince George's County and other counties in Maryland. This literature review served as the theoretical framework for the research problem and questions. Chapter 2 covers the following topics: (a) the relevance of literature to the research question, (b) the data sources used, (c) a review of systems theory, (d) an assessment of the current literature on the community services known to reduce PPRs in the United States. The literature review, which focused on Medicare beneficiaries, included any type of community health service offered to all citizens. It included patients who were in need of services following discharge to prevent unnecessary readmissions, and how, through community collaborative efforts, the patients could remain in a healthy environment at home.

The following databases were used to identify and retrieve items for this review: Medline, ProQuest, SAGE, and SocINDEX. Data were also obtained from three policy institutes, Dartmouth Institute for Health Policies and Clinical Practices, and RAND Corporation, from the Health Care Financing Administration of CMS. The literature search used the following keywords: *CMS, care transition, collaboration, health care, reimbursement, Medicare, Medicaid, PPRs, Prince George's County, QIO, quality of care, rehospitalizations, readmissions, subsidies, systems theory,* and *Triple Aim.* Retrieval was restricted to articles in English between the years 2009 and 2013. Of the 265 items scanned, approximately 70 were used for this review.

For current data on Medicare claims, the CMS website was used. For community statistical data, the following public websites were used: Area Resource File (ARF, CDC), Maryland's Department of Health and Mental Hygiene (DHMH), Health Services Cost Review Commission (HSCRC), Maryland government, Maryland Health Care Commission (MHCC), Prince George's County, County Health Rankings, and the United States Vital Statistics Administration (VSA). The public websites included the data needed for this study, and none of the data were manipulated for this study. Besides reviewing Prince George's County census information, I reviewed the County's Medicare claims data as summarized by CMS for public viewing. These data resulted in a report on PPRs (CMS, 2011b).

Relevance of this Literature to the Research Question

The research question asks about the correlation between community support services and the PPRs for Prince George's County. The lack of adequate community support services could jeopardize the well-being of the citizens and thus return them to the hospital when the readmission stay was preventable (CMS, 2011c). This research study examined the misalignment of community support services based on the patients' needs, a misalignment that can result in a higher than average readmission rate in Prince George's County as compared to other counties in Maryland.

The research question focused on the community support services in Prince George's County with the CMS data provided on the PPRs. The analysis correlated the community and PPRs in Prince George's County and the other Maryland counties to determine if the lack of adequate community support services increased PPRs. If the

other counties have fewer PPRs, do they have more community support services? What types of community support services are available in each county, and does Prince George's have more, equivalent, or less? What are the services that most align throughout the state that assist in reducing PPRs? What community support services are most in need in Prince George's County to reduce PPRs?

Historical Perspective

CMS reimburses hospitals for admissions and anticipates that upon discharge, patients can find community support services to be able to remain healthy at home (Raybum, 1992). Studies on high-risk Medicare patients have shown that readmissions occur when the transition from hospital to home fails due to the lack of availability of community support services (Coleman, 2004). Section 3026 of the ACA provides funding for the development of models that show improvements in care for Medicare high-risk beneficiaries (CMS, 2011d). Care transitions are seen as the "local health care systems' ability to coordinate care for patients across the full continuum of care settings: hospitals, rehabilitation and skilled nursing facilities, nursing homes, clinical offices, hospice, and home" (Goodman et al., 2011, p. 3). CMS identified three goals that would result with improved care transitions: (a) improve quality of care, (b) reduce PPRs, and (c) reduce wasted costs in the system (CMS, 2011d). As part of the Partnership for Patients, the Community-based Care Transition Program (CCTP) is intended to reduce injuries and complications and to improve care transitions from inpatient to outpatient settings by offering more community support services to the patients (CMS, 2011d). A

further look into the national issues surrounding the three CMS goals was necessary to see if a literature gap existed.

Goodman et al. (2011) studied the nation's affects on readmissions and found (a) little reduction had occurred in the readmission rates, (b) high use of hospitals for medical conditions showed the highest levels of readmissions, and (c) to improve the care of the elderly, the review of the continuum of care was necessary. Without a new reimbursement model for inpatient and outpatient services, the continuation of the high readmission rates was likely (Jencks et al., 2009). The Goodman et al. (2011) and the Jencks et al. (2009) studies supported the idea that CMS's Partnership for Patients initiatives can affect a reduction in PPRs. Care coordination was a continuous process that began before hospitalization, continued during hospitalization, and followed while the patient was back in the community (Goodman et al., 2011). To develop an effective community program with appropriate funding, CMS developed rules to meet its predetermined goals and measurements as identified in ACA.

The CCTP is required to have some basic elements as defined in section 3026 of the ACA to meet required measurements. ACA required the CCTP be led by a community based organization (CBO) that would provide "care transition services across the continuum of care through arrangements with subsection (d) hospitals and whose governing bodies include sufficient representation of multiple health care stakeholders, including consumers" (CMS, 2011a, para. 2). The CBO is to utilize arrangements to provide care transitions and report on outcomes to CMS based programs on

predetermined measurements. Arrangements must be agreed to prior to the submission of the CMS application by the CBO (CMS, 2011d).

The CBO and their hospitals will submit their proposed care transition services application to reduce readmissions to CMS based on root-cause analyses of recently readmitted patients. Applicants will describe how care transition strategies will incorporate culturally appropriate and effective care transition beneficiary-centered approaches to ethnically diverse beneficiaries, and how other community and social supports and resources will be incorporated to enhance the beneficiaries' post-hospitalization management outcome. (CMS, 2011a, para. 5)

The CBO applicant provides a budget on a per discharge rate, submits an implementation plan with milestones, and demonstrates prior experience in care transitions. Before approval of the CBO, CMS requires that the CBO worked with the local Area Agency on Aging and be able to demonstrate prior experiences in programs that supported a reduction in PPRs (CMS, 2011c).

Once CMS approves the proposed care transition services plan and related costs, the CBO and hospitals can initiate their paperwork to be reimbursed by CMS for their care transition services (CMS, 2011d). The CBO's function is to receive the CMS funding and, through agreements and predetermined processes, document activity of the patients seen in the program (CMS, 2011d). The CBO will pay the hospitals for every beneficiary who participates in this transitional care program, based on the agreement of costs incurred. Some CCTPs may have all costs incurred by the CBO and no reimbursement to the hospitals (CMS, 2011d). Although the CMS funding to the CBO is

for 5 years, the initial award is for 2 years, with possible annual extensions for 3 years based on results (CMS, 2011d). Positive results include meeting the three CMS goals, as well as ensuring that patients are receiving a positive beneficiary-centered experience (CMS, 2011d). CMS identified the hospitals with high PPRs as receiving preferential treatment in the application review process (CMS, 2011d).

CMS has documented the eligible hospitals that can work with the CBOs as those hospitals with high levels of high-risk Medicare readmissions. A listing of eligible hospitals is provided by CMS on its website (CMS, 2011b). Because four of the five hospitals in Prince George's County are on the CMS eligible hospital report, the research question that was formed focused on identifying the differences among the counties in Maryland, and which community-based care transition services are lacking in Prince George's County that are provided for in other counties in Maryland that have lower PPRs.

PPRs: The Early Identification

The literature review for this study began in 2009. The intent of the review was to understand other scholarly works that examined the processes affecting the continuum of health care. In recent months, the study narrowed to examine the community-based care transition factors affecting the PPRs in Prince George's County (CMS, 2011a). The majority of the scholarly works focused on the health care industry or governmental data concerning the quality of care and reasonable payment for services. This research study focused on searching for a gap in the literature regarding whom or what affected the delivery of services so that the patient experienced the best continuum of care from

discharge through outpatient services in order to remain healthy at home. In reviewing other national studies that affected the continuum of care, it is expected that some of those issues may also apply to this study concerning the citizens of Prince George's County.

History of the Continuum of Care Efforts

In the history of the United States, attempts to offer the appropriate health care to the citizens in the right setting, at a reasonable cost, and at the right time, the government had attempted many fiscal offerings to encourage providers in the continuum to work together and to offer complementary services (Burton et al., 2002). Stevens (2008) summarized this history in the following passage:

> From the 1960s through the 1980s, there were half-hearted attempts to use government funds to encourage the coordination of an increasingly fragmented delivery system and thus improve access to care and efficiency in health services provision; that is, to act on the supply side while also increasing the demand for care….. Federal funds also helped produce new experts: health planners. What seems obvious in hindsight was not so obvious at the time. It was unrealistic to expect the rational knowledge of problems, as outlined in a plan, to be a sufficient goad for hospitals, nursing homes, and other local organizations and groups to give up some of their autonomy and expansive building schemes in favor of the public good, as defined by an agency with no money to offer in return. (Stevens, 2008, p. 475)

Stevens (2008) summed his work with these two questions "Will the United States meet social, behavioral and medical goals for its population as a whole? Will there be a workable consensus as to what those goals should be" (p. 481)? CMS continues to focus on the transition from inpatient to outpatient services—such as nursing homes, home health agencies, physician offices, and home—. Stevens predicted that CMS had to be involved to in order to achieve quality of life for patients through the incentive and penalty payment process. A brief historical review of how CMS uses its incentive and penalty payment process follows in the next section.

CMS: The Triple Aim Approach

Dr. Donald M. Berwick was the head of CMS from April 19, 2010 until his departure in December 2011 (Metzler, Hartmann, & Lowenthal, 2012; Meyer, 2011). Berwick had been an outspoken scholar on socialized medicine and the rationing of health care long before his appointment, which was just a month after the ACA was passed into law (Berwick et al., 2008; Meyer, 2011). Upon accepting this appointment, under the watch of President Barack Obama, Berwick assumed the implementation of ACA. Berwick et al. (2008) proposed the Triple Aim approach to improving the health and wellbeing of patients years before the ACA was passed into law when Berwick was head of the Institute for Healthcare Improvement (IHI) (Couch, 2012). The Triple Aim approach included "improving the experience of care, improving the health of populations, and reducing the per capita cost of health care" (Berwick et al., 2008, p. 759). Through the achievement of these three goals, the United States has the opportunity

to achieve high-value health care (Berwick et al., 2008; Epstein-Lubow, 2012; Reuben & Tinetti, 2012).

By July 2010, Berwick and his staff began to send the message that "most health care providers are committed people stuck in a horribly broken system and are now called to repair it" (Meyer, 2011, p. 2280). This section described each component of the Triple Aim approach, which are dependent upon each other to be successful (Berwick et al., 2008). Quality of life for the individual and the population, along with reduced cost per capita, was the focus of CMS ("Health-Related Quality of Life and Well-Being," 2010). Then scholarly articles are presented to show how the early stages of the ACA implementation, with the Triple Aim approach, affected individuals, society, and the cost per capita. Finally, this section will lead into how the ACA has provided opportunities for the development of CBO with CCTPs as demonstration projects with the Triple Aim at the heart of the service and cost design.

Triple Aim: The Individual Health Care Experience

To improve the individual health of patients, access to quality care is required to include equipment, staff, and the location of the care delivery (Berwick et al., 2008). Use of preventative medicine measures, such as assignment to a primary care physician and the problem levels of drugs and therapies, is necessary to improve health while reducing unnecessary costs (Berwick et al., 2008). The results of reducing unnecessary costs while improving the access to care is the formula for improved outcomes (Berwick et al., 2008).

Each individual requires different levels of health care and the further exploration of how to design a system that meets the individual experience "lies in the realms of ethics and policy; it is not technically inherit in the Triple Aim" (Berwick et al., 2008, p. 760). CMS approached the Triple Aim from the standpoint of equity in society, and not differing services affecting one subpopulation over another. When applying these thoughts on the first aim of the individual health experience, Berwick encouraged his staff to visit the providers of care and the patients in their homes to be able to have improved insights when setting policies (Meyer, 2011).

There are obstacles to achieving the first aim of the individual health experience, which begins with individuals understanding the determinants of their health (Berwick et al., 2008). The determinants of health are the individual's willingness to seek the care, the individual's social and economic environment, and the individual's understanding of the opportunities for quality care. The Triple Aim components are dependent upon each other to be successful, so just removing the obstacles in care experience does not lead toward society's health improvement or a reduction of cost per capita. By "optimizing on three aims at once requires constraints on at least two of them" (Berwick et al., 2008, p. 763) so it is necessary to continue to define the next two components of the Triple Aim.

Triple Aim: Improving Population Health

The second component of the Triple Aim is to improve the population's health, which means to improve outcomes. Berwick et al. (2008) wrote that the United States was the only industrialized nation not providing universal health care, a thought that with universal health care, all subpopulations in the United States would receive the same

quality of care and improved outcomes. Currently, measuring the most common reason for Medicare beneficiary admissions, congestive heart failure (CHF), showed that 40% of these patients were readmitted within 90 days of discharge (Berwick et al., 2008). With the best efforts by the care providers, this result showed that poor service amid high costs could not improve the population health (Berwick et al., 2008). Because CHF is not an isolated diagnosis reflecting poor outcomes, a further review of how to improve the population health continued at CMS with the introduction of ACA.

As with the first aim, a health system must exercise a balance among the three aims. The second aim, outcomes, is affected by policy constraints that reflect equity among subpopulations (Berwick et al., 2008). Because the health care financial models, before ACA was enacted, did not offer a health care system supporting all subpopulations, Berwick et al. (2008) identified that if was not in the self-interest of providers to support all three aims. Berwick et al. noted that a hospital could remove obstacles under its control but not amidst the total environment of its patients, particularly their social and economic issues.

The ACA's approach to population health was to form a linkage among providers, patients, and the environment. Berwick et al. (2008) suggested that individuals and providers have self-interests that might appear to be irrational, and that must be understood and accepted for rational collective efforts to move toward improved community resources resulting in improved population health. With the linkage of policies to provide the first two aims of improved access to care and improved outcomes, the cost per capita would increase unless policies are developed that exercise balance

among the Triple Aim components. A continuation of the definition of the Triple Aim, in terms of examining how to control the cost per capita follows.

Triple Aim: Reducing Cost of Care

The final component of the Triple Aim is the reduction of the cost per capita. Any nation can offer universal health care to all is subpopulations without attention to the cost, but this would result in a system that is not sustainable for the nation (Berwick et al., 2008; Meyer, 2011). Berwick suggested that reducing costs by improving care was the method to the Triple Aim, ACA, and demonstration projects such as the Partnership for Patients (Meyer, 2011). How to link the cost per capita to the first two aims was implemented through offering demonstration projects to hospitals, who Berwick considered to be at the heart of the change efforts (Meyer, 2011). Efforts to reduce costs included processes of transitioning patients from hospitals to home and the community.

The offering of innovative ideas to transition patients to return to their homes and utilize outpatient services to remain healthy at home was part of the ACA, under the Partnership for Patients public-private campaign (Meyer, 2011). Within ACA, CMS issued mandates to reduce readmissions, preventable conditions, medical error rates, and other negative outcomes, or face a financial penalty. Prior to the commencement dates of penalties, CMS offered demonstration dollars to work toward improved outcomes with reduced cost per capita (Meyer, 2011). In the end, these innovative ideas developed from the demonstration projects would reduce per capita costs, either by implementing newly improved processes or refusal to pay providers for poor outcomes.

Even with the opportunity to ask for innovative dollars to develop new processes, all providers are not necessarily able to pursue these dollars or even have enough private dollars to develop new processes (Berwick et al., 2008). Hospitals have infrastructure changes that require new improvements to be funded by internally generated profits before efficiencies in systems are apparent. The capability of concurrent measurement of patient outcomes presents a major obstacle. (Berwick et al., 2008). Concurrently capturing of all relevant data, such as the clinical, financial, and patient social-economical information, would offer the hospital the necessary tools to track its progress and the progress of the community in meeting the Triple Aim. This more complex set of system metrics to define the determinants of health care's Triple Aim is yet to be identified by CMS.

Determinants of Health Explored

In order to understand the determinants of health, a definition of the population is necessary. A population is defined as a registry of defined groups of people with a common ailment, such as CHF, diabetes, or Alzheimer's (Berwick et al., 2008; "Determinants of Health," 2011). Once these subpopulations are defined and traceable, the Triple Aim can be applied to them. The determinants of health must also include "the range of personal, social, economic, and environmental factors that influence health status" ("Determinants of Health," 2011, p. About). Understanding the linkages among the components of the determinants of health per subpopulations can lead to accomplishing the Triple Aim.

Healthy People 2020, a CMS innovation project, explores two questions about individuals and their health status in their environment, and an emphasis on an ecological approach to disease prevention and health promotion through the linkages of individuals and the population determinants of health ("Determinants of Health," 2011). The Healthy People 2020 project reviews the linkages of the determinants of health in the improvement of health care outcomes.

Healthy People 2020 suggested that determinants affect health outcomes; for example, policy-making to increase the tobacco tax might deter smokers from partaking. The social determinant of eliminating smoking in public locations could deter smokers. A third determinant, access to health services, can affect the individual or population from receiving the necessary care to remain healthy at home. In Prince George's County, the lack of adequate primary care physicians represents an example of the health services determinant (Lurie et al., 2009). The fourth determinant to health is how the individual plays the role in providing healthy actions, such as food, smoking, physical activity, substance abuse, and other preventable actions. The last determinant to health is unavoidable: the biology and genetics, or a person's genetic material and aging body. Epstein-Lubow (2012) also suggested that a triadic among the elderly, the family, and the clinicians enhances the determinant of health outcomes.

Quality Bases

Quality is a premise with the Triple Aim approach by CMS ("Prevention Quality Indicators Overview," 2012). The current CMS programs have a financial framework, one that pays for performance; while, the new ACA framework is focused on improved

outcome measurements (Berwick et al., 2008; Stine & Chokshi, 2012). An austere reduction of hospital payments for services without an overlapping of enhanced community services will result in decreased, not increased, health care outcomes. For quality outcomes to result at a reasonable per capita cost, Stine and Chokshi (2012) suggested reinforcement of a common agenda for medicine and public health is needed. The sharing of inpatient discharge data is one source in developing this common agenda.

The Prevention Quality Indicators (PQIs) set of measurements allows the abstracting of relevant data from hospital inpatient discharge data to locate areas of concern in the community ("Prevention Quality Indicators Overview," 2012). The PQIs can be a starting point for the common agenda among providers and public health departments. Identification of reasons why patients return to the hospitals frequently may be discovered in the PQIs.

Quality indicator development, such as the PQIs, are a result of the medical record professional standardized coding of inpatient hospitalization medical records ("Quality Indicator Development," 2012). As hospitals move toward an electronic medical record (EMR), additional standardization in clinical documentation will result in improved PQIs. The Triple Aim requires a relationship among the patient, the community, and a reduction of cost per capita to be successful. With a premise of CMS paying for quality outcomes, tools such as the PQI can set common agendas to proceed to meet the Triple Aim.

Early Stages of ACA and the Triple Aim Approach

This section includes a review of scholarly articles describing how, in the time since the ACA, scholars have documented the manner in which clinicians have tried to improve upon service delivery to answer the concerns identified in the Triple Aim program. From primary care, to specialty care, to the community, initiatives will be presented to provide examples of attempts to improve society's health without expanding on the cost per capita.

Providing primary care was the main theme in the ACA (Berwick et al., 2008; Metzler et al., 2012). By strengthening, redefining, and increasing the primary care clinicians, such as physicians, nurse practitioners, and physician assistants, the nation's health care system and outcomes will improve (Berwick et al., 2008; Metzler et al., 2012). The growth of primary care clinicians will result in more preventable care and fewer unnecessary readmissions (Metzler et al., 2012). Conversely, as the number of primary care clinicians decreases, the amount of misuse of the emergency rooms and possible unnecessary admissions (Lurie et al., 2009) increases.

Berwick et al. (2008) suggested to redesign the primary care function organizations or integrators accept the Triple Aim approach for their population. The military community has not kept pace with the civilian market in offering efficient and effective superior quality health care systems (Coppola, Satterwhite, Fulton, Shanderson, & Pasupathy, 2012). Since the initial inroads in hospital efficiency were developed by Dr. James Tilton, Surgeon, Continental Army, 1779, the military health care delivery system has shown few efficiency advancements (Coppola et al., 2012). No common metric is

used for comparisons among military facilities. Cost per capita is not a focus for creating value over the entire military population. The experience of care is not necessarily compassionate for the soldiers and their families. The Triple Aim has not been embraced by this area of government, but once metrics are chosen, leaders will focus on the Triple Aim approach (Coppola et al., 2012). The patient-centered focus will be required for the military and their families, as well as all United States citizens.

Reuben and Tinetti (2012) suggested that patient-centered care works for single diseases. The Triple Aim works well for single diseases, but may not be appropriate for co-morbidities (Reuben & Tinetti, 2012). A goal-oriented patient care focus is more appropriate for patients with co-morbidities, because the patients might choose one treatment over others based on their own life needs and perceptions. Thus, the patient customizes the goal. Offering hospice or palliative care are examples of goal-oriented choices for the patient, with possible outcomes that differ from CMS's patient-centered results. The outcome is based on the predetermined goal and not the subpopulation's patient-centered outcome. With this concept, CMS might find that applying the Triple Aim will not achieve the desired result, and the provider will be financially penalized.

To this point, the focus has been on primary care, military care, and patients choosing their care goal. Each touch upon the ACA and the Triple Aim concepts, but none has shown an integrator or accountable care organization (ACO) that the ACA was anticipating would address the Triple Aim. Next, a discussion by Baylor Heath Care and Ascension Health Partners will be presented that reflects upon the ACO model as developed in the ACA.

Baylor Health Care, with 4,500 physicians, was unable to file for the Medicare Shared Savings ACO because its board of directors did not believe it could meet the ACO formation rules (Couch, 2012). First, the board moved toward developing an ACO with employed and community physicians with the Medicare Shared Saving, and had put in more than 750 physician hours in developing the disease-management, population-management delivery care system (Couch, 2012). The obstacle with the Baylor structure was the requirement by CMS to use the physician group's Tax ID number instead of physicians' individual National Provider ID (NPI) for the patient attribution. The issue was that the Tax ID incorporated physicians who were not in the ACO. Baylor suggested using the National Provider ID (NPI) because it was unique per physician, but CMS had reasons that this was not possible. The Baylor application was suspended with CMS, but Baylor continues to grow its integrated network continually asking CMS to reconsider the NPI.

Two of the 32 Ascension Health hospitals were able to start a Pioneer ACO model to include population health and risk taking (R. D. Anderson et al., 2012). Success in the Pioneer ACO will require achievement of the Triple Aim: increase access, reduced cost per capita, and improved population health. The two hospitals will be successful if the financial risk model that they chose is met. Each hospital chose a different one of the 5 risk-bearing models offered by CMS (R. D. Anderson et al., 2012). The movement from a fee-for-service model to a value-based model is the design of the ACA in meeting the Triple Aim. A less risky alternative to working with the Triple Aim is to focus on the innovative programs offered by CMS under the CCTP.

The ACA offered funding in the Partnership for Patients for community-based organizations that want to achieve the Triple Aim without risk sharing (Meyer, 2011). This funding is intended to develop test models for reducing specifically identified clinical errors or disease management (Meyer, 2011). The structure of these models begins with CBOs with two or more hospitals and many community clinicians. Today, just as Stevens (2008) predicted, CMS offers funding to help the CBOs achieve this quality of life for patients by enlisting the hospitals in CCTPs during the post-discharge efforts to keep healthy patients out of the hospitals that have been thought to hold more harm than needed for patients (Goldfield, 2008). A review of the literature concerning the care transition programs will link the movement of the ACA and the Triple Aim into the less risk oriented CCTPs.

Care Transition Programs: Studies and Theories

Before examining the current studies documented in scholarly journals on CCTPs, it is important to provide an overview of the studies from the hospital discharge processes that returned patients to the community. The following studies are summarized here and expanded upon later in this chapter. Jack et al. (2009) studied an enhanced hospital discharged planning process that resulted in a reduced number of readmissions. Naylor et al. (1999) studied the use of advanced practice nurses in comprehensive discharged planning, which resulted in a short-term reduction of readmissions of elderly patients. Dedhia et al. (2009) concluded in their study that when specific needs are met for the elderly, the health care outcomes can be considerably improved. Helleso, Sorenson, and Sorenson (2005) studied the exchange of electronic nursing discharge information

between hospital nurses and home health nurses in the hopes of enhancing the continuity of care. Another study focused on the tools used to assess the quality of the discharge process to ensure the patient and caregivers were prepared for the transition to the community (Grimmer & Moss, 2001). Besides processes that returned patients to their community, further research was necessary to understand what occurred after discharge.

One study that followed patients after discharge was performed by Mor, Intrator, Feng, and Grabowski (2010). This study examined readmissions between hospitals and nursing homes. Mor et al. were most interested because the nursing homes had 24-hour health caregivers, and yet, rehospitalizations occurred because of the lack of financial incentives to keep patients in the nursing home setting. A further study of the literature was necessary to examine the relationships of patients and other types of caregivers to continue to evaluate community-based care transition settings.

Coleman et al. (2004) studied patients living at home with assistance from caregivers. This study concluded that increased activity of the patients and caregivers produced greater reduction of PPRs. In later years, Coleman developed a model that described coaches for the home-based patients who managed themselves ("Abstract: Research and markets; reducing hospital readmissions toolkit: Comprehensive four-volume set that illustrates innovative strategies to reduce unnecessary hospital readmissions," 2010; Coleman, 2004). If Coleman et al. saw a reduction of PPRs, and then a further review of literature was necessary to uncover what was happening in the community that allowed patients to remain healthy in their homes.

A research study was performed by Vest et al., (2010) that documented the determinants of PPRs. Their conclusion focused on the factors that play a role in the reductions of readmissions, financial, clinical, environmental, and political to name a few. This study suggested that many factors affect readmissions, and that not one hospital or community was so alike as to suggest that there was one model to fix the readmission swinging door between home and hospital. The remainder of this section delves into these individual studies and theories to provide the reader the opportunity to see how the potentially preventable readmission subject has evolved in literature. This paper intends to fill in the existing literature gap concerning the needs of Prince George's County, in which four of the five hospitals are on the Medicare high-risk for readmission list.

Reengineering of the Hospital Discharge Process

Jack et al. (2009) studied the reasons for high emergency room visits and rehospitalizations following discharge. This study tested "the effects of an intervention designed to minimize hospital utilization after discharge" (2009, p. 178). In this study, the nurse discharge advocate worked with the patient and caregiver to educate, arrange follow-up appointments, reconcile medications, and deliver an individualized booklet to the primary care provider. The clinical pharmacist participated in the process by contacting the patient or caregiver days after discharge to ensure the patient was following the drug protocol.

The intent of this study by Jack et al. (2009) was to reduce emergency room visits, reduce PPRs, and increase visits to primary care providers. The limitations of this study were twofold: (a) not all potentially eligible patients were enrolled in the study and

(b) the need to rely on a patient' self-assessment could have distorted the results. Given these limitations, the study did offer a comprehensive review of the discharged process.

There were 11 components to the discharge process performed by the discharge advocate and the pharmacist. The discharge advocate performed nine components during the inpatient stay and one action after the stay. The pharmacist performed telephone follow-ups after the stay to review medications and address any concerns (Jack et al., 2009). As in previously presented studies, Goldfield (2008) and Goodman (2011) identified education and medicine management as two factors necessary to help patients remain in the community. Jack et al. offered these 11 interventions to ensure that healthy patients could remain at home.

As these interventions increased by the discharge advocate and the pharmacist, the more costly emergency room and inpatient stays decreased, while the primary care provider visits increased for a net decrease in cost to patients and their insurance carriers (Jack et al., 2009). Although the costs for implementing this type of care transition program may vary from hospital to hospital, this study did show that it was possible to reduce hospital utilization, improve patient participation in care, and increase the primary care provider's interactions with the patient. National Quality Forum found the results significant enough to encourage hospitals to consider such a program. CMS has identified this type of program as being effective in innovative projects such as the CCTP (CMS, 2011c).

Comprehensive Discharge Planning Process

Naylor et al. (1999) conducted a study following up on the innovative ideas that were being used by hospitals for the older Medicare patients with congestive heart failure. This study focused on other surgical and medical diagnoses for the fragile elderly, to see if the same results of reduced readmissions and costs could occur. Advanced practice nurses (APNs) worked with patients during hospitalization and then continued to see the patients in their homes. The study included a control group and an intervention group that received home visits.

Through the use of a control group and an intervention group, the study demonstrated individuals in the control group were more likely "to be readmitted at least once" (Naylor et al., 1999, p. 617). The intervention group had fewer total readmissions over a 24-week period. The total number of days in the hospital was fewer for the intervention group. Days from discharge to the readmission were greater for the intervention group, even in the case of death during the readmission. This study showed decreased costs for the intervention group as compared to the control group, both of which had similar demographics. As APNs visited the patients in their homes, the patient's care began to include all aspects of the environment, in other words, a holistic approach, to ensure that the healthy patient remained at home.

This study was aimed at focusing on a holistic approach to the patients' care and not "the typical disease management model that focuses on all patients hospitalized with a specific primary condition" (Naylor et al., 1999, p. 619). The researchers believed that the focus on the clinical interventions and comorbid conditions was the major influence

in the study's success. One major factor was that the APNs could use their judgment when caring for the patients at home, unlike home health providers who were constrained by rules and reimbursements. Even with these new home interventions, the projected savings to Medicare were substantial. The next step would be to consider how the hospitals could implement this type of program and have it reimbursed by the payers or through cost savings. There are many different types of hospitals such as rural, urban, community, teaching, specialty, for profit, nonprofit (Pape, 2008). Finding a funding mechanism for home interventions initiated at the discharge planning stage of treatment required further study.

Discharge Planning in Different Types of Hospitals

A third study by Dedhia et al. (2009) on discharge planning evaluated discharge planning processes in an academic center, a community teaching hospital, and community-based nonteaching hospital. The study was focused patients who were 65 or older, and the objective was "to study the feasibility and effectiveness of a discharge planning intervention" (Dedhia et al., 2009, p. 1540). This study differed from the Jack et al. (2009) and Naylor et al. (1999) studies in that it brought the same discharge planning process into three different types of hospitals to see if the process would work regardless of the type of 65+-year-old patient who was served. The inpatient medical wards were manned by hospitalists (Dedhia et al., 2009). The criteria for choosing the patients included the following: age 65 or older, home bound after discharge, English speaking, established mailing address, and admitted to the medical ward from the emergency room or provider. There were a few exclusions such as death eminent, discharge to another care

setting other than home, or readmission within a few days. Coleman's Care Transition Measures (Coleman, 2004) were used by the intervention team to document the outcomes.

The intervention team worked together during the stay, and focused on many geriatric issues (Dedhia et al., 2009). Discussions with the patient's primary care provider and the hospitalist-pharmacist collaboration on medications occurred during the stay. The discharge planning nurse, hospitalist, patient, and caregiver met to discuss "the hospital course and follow-up recommendations before the patient left the hospital" (Dedhia et al., 2009, p. 1542). Patients were also contacted by hospital staff a week after discharge to answer any questions or concerns. Before this study, none of the hospitals in the study had implemented the Coleman model (Coleman, 2004). The reduction of PPRs was not considered by the hospitals in any of their current discharge planning processes.

The purpose of the study was to reduce the 30-day readmission rate and returns to the emergency room for readmission (Dedhia et al., 2009). Both goals were met at all three hospitals for their geriatric patients in the study, although one hospital had a greater improvement. This variance may be because of a variety of reasons that are unique to that facility. Overall, interventions from hospital to home produced a reduction in readmissions. One major factor was the interplay between the patients and their primary care providers, an issue that is yet to be resolved for all patients in Maryland because of a shortage in primary care providers (MHA, 2008). The interplay among providers required effective communication, so I determined that a review of literature on improved

communication among providers was necessary to identify a successful transition from hospital to home.

Exchanges of Discharge Notes

Helleso et al. (2005) studied the effect of sharing nursing electronic notes between discharge nurses and home health nurses to improve upon the continuum of care. This article built on the concept that the linking of inpatient staff to the community-based care team was a first step in the reduction of PPRs, and an increase in outcomes for the patients along with the reduction of costs of health care. The Hellesco et al. (2005) study showed that communication between discharge nurses and home health nurses differed "both before and after the electronic patient record implementation" (p. 1568). This study was essential to the research being conducted on community-based care transition programs because there was a need to understand that the different provider groups assess information differently based on their organizational context. An effective CCTP will take into account the intent of the provider writing and reading the notes (Helleso et al., 2005). A further study of the tools used in communication within the health care community should illuminate the characteristics of an effective CCTP that helps healthy patients reside at home.

Assesses Discharge Planning Results

Grimmer and Moss (2001) studied patients, caregivers, and discharge planners in Australia. The instrument used focused on communication among these groups. The tool gathered information from the community on the discharge process. As in the Helleso et al. (2005), this study focused on communication as an important aspect to ensure quality

outcomes for patients post discharge (Grimmer & Moss, 2001). As with the CMS (2011d) goals, the goals of the Grimmer and Moss (2001) study were medical communication, medication management, and coping with the expected and unexpected activity post discharge. The tool developed in this study was named PREPARED (Grimmer & Moss, 2001).

This tool not only was used to looked at the education provided by the hospital, but it was used to look at the satisfaction with community services (Grimmer & Moss, 2001). PREPARED asked questions concerning the worries patients had while at home. The obvious concerns were clinically related, but now we saw more questions on extra out of pocket expenses such as gas or taxi fees to get to a primary care provider, additional shopping needs, electricity costs, and pharmacy costs. The Grimmer and Moss study included post discharge calls that helped to gather additional unexpected information from patients the first week, the second week, and the third week. With each call, uniqueness issues of returning to home post discharge were documented.

This study's focus was on the long-term view of how discharge processes effected patients outcomes (Grimmer & Moss, 2001). Hospital employees were concerned with the day of discharge, while the patients and their caregivers were concerned about the long-term situation of remaining at home and capable of receiving necessary outpatient services. This study began to touch upon the viewpoint of the patient and the ability to find the necessary community-based care when transiting from an inpatient stay. A further review of patients whose first stop was not home after discharge, but a specialty facility, such as a nursing home for rehabilitation, was necessary because the discharge

advocate was now once removed from knowing about the patient's immediate care before returning home.

Skilled Nursing Facilities and Rehospitalization

A study by Mor et al. (2010) on the subject of transiting from home to the community included patients who first transitioned from the hospital to the skilled nursing facility for rehabilitation before going home. Medicare Payment Advisory Commission (*Medicare Payment Advisory Commission Report to the Congress: Reforming the delivery system: A path to bundled payment around a rehospitalization*, June 2008) data on patients who discharged to a skilled nursing facility documented that "almost one-fourth of Medicare beneficiaries…were re-admitted within 30 days" (Mor et al., 2010, p. 57). The study noted that current financial incentives for providers do not encourage provider collaboration for the benefit of the patient. Mor et al. found that "hospitalization within 30 days of the original hospital discharge rose from 18.2% in 2000 to more than 23.5% in 2006" (Mor et al., 2010, p. 60). The study also documented increased use of nursing homes and medical visits at the end of life, which could be for many reasons, from the lack of community support to necessity because of the type of diagnosis and the best location for care. Mor et al. (2010) did document previous findings that a high proportion of skilled nursing home rehospitalizations were preventable.

The Mor et al. (2010) study provided three important lessons for policymakers: (a) financial disincentives for rehospitalizations from skilled nursing facilities should be considered, (b) skilled and long-term nursing facilities both have high readmission rates that should be examined, and (c) local-area factors may influence readmissions, such as

willingness to use hospice or provider norms. Mor et al. suggested in order for the nation to reduce readmissions it is vital to understand community-based care transition models that address the nursing home swinging door. To help patients and caregivers work toward reduced PPRs. studies of patient and caregiver education and the occurrences of PPRs by those who participate in the care delivery system were necessary.

The Care Transition Intervention Process

Although a few studies previously mentioned addressed the education of the patient and caregivers, Coleman et al. (2004) touched upon the need for the patient and caregiver to participant actively in the care transition to home. The study focused on 65 and older community-dwelling adults with one of nine selected conditions. Tools and supporting coaches provided the patients and caregivers guidance. There were two groups, a control group that did not receive tools and a coach, and an intervention group that did. The coach encouraged self-management, but also provided training when necessary. The rapport with the coach started when the patient was in the hospital and continued when the patient returned to the community. Home visits included post-hospital medication management, role-playing in case of difficult situations, training and education, and helping the patient and caregiver identify red flags. The coach visited the patient for up to 24 days after discharge to home. Those with interventions experienced improved outcomes.

The intervention group was less than half as likely to be rehospitalized (Coleman, 2004). The intervention affect was sustained well beyond the 24 days, as seen by the 30-, 90-, and 180-day marking points in which the intervention group returned to the hospital

fewer times than the control group. This study documented much of the same results as previous studies in which coaches helped the patients and caregivers post-discharge. Coleman et al. (2004) began to suggest that patients who are prone to readmission but are not part of the chronic high-risk patients should be the next frontier to ensure reduction of PPRs. To this point, studies had not considered all the components of the community at one time, but instead each study focused on one or two provider or caregiver interactions. Few had studied the effects of community change on PPRs, in particular the environment.

Determinants of Preventable Readmissions

Vest et al. (2010) systematically reviewed the literature on PPRs and found few studies on the effects of multiple hospitalizations on payers, providers, patients, and rehospitalizations. CMS solicited CBOs to apply for the CCTP funding and designed an acceptable community model because of the lack of current studies to use in a new CMS patient delivery model (CMS, 2011d). One study examined touched on the community support systems (Grimmer & Moss, 2001), but this study was in Australia not the United States.

Vest et al. (2010) noted all studies defined PPRs the same. Some studies worked with the all cause admissions and readmissions model, and others with the chain readmissions model, one in which the readmission was related to the discharge. Studies focused on different diagnoses, populations, locations, and other demographics. One commonality appeared to be poor-health or frailty. “Few studies ventured to examine organizational and environmental factors” (Vest et al., 2010, p. 22). The study of Prince

George's County helps to fill in the literature gap that addressed which collaborative interventions have potential to reduce PPRs.

Vest et al. (2010) did not find one intervention in all the literature that would reduce PPRs. The study recommended continued research in order to document an understanding of the reasons for readmissions and the opportunities to reduce PPRs. The next section of this research study focuses on the statistical information gathered to assist in focusing on Prince George's County in the plan to identify collaborative intervention to reduce PPRs.

Government Statistical Information and Plans to Reduce PPRs

The previous section focused on the current literature concerning collaborative interventions to reduce PPRs. This section of the literature review is focused on the national, state, and county readmissions numbers in order to identify why PPRs are costly to our economy and result in poorer outcomes for patients. Understanding the data provided by CMS from the patient claims data was necessary to provide the incentives to improve community services.

National Readmissions

The Institute of Medicine's *To Err is Human Study* (1999) estimated that preventable medical errors killed 98,000 Americans annually even though efforts were underway to reduce PPRs (CMS, 2011c). With patients continuing to get sick, injured, or die unexpectedly in hospitals, CMS turned its focus on the safety of the patient. For CMS the right care setting for the treatment was critical in improving patient outcomes and producing fewer adverse events.

A recent study of three hospitals found that 33% of hospital admissions resulted from adverse events although improved patient safety was a priority for government through voluntary reporting and Agency for Healthcare Research and Quality Patient Safety Indicators (Classen et al., 2011). This finding led to the conclusion that if patients do not need the hospital setting for their care, then a program designed to help patients receive care after discharge in their environment would be safer and less costly (Orszag, 2010). Goldfield (2008) and Graham, Ivey and Neuhauser (2009) noted earlier studies on the high cost of health care also concluded that inpatient stay was often not the right setting and affected the quality of care. The adverse events in hospitals linked with the PPRs became CMS's focus to improve the post discharge services to the healthy patient living at home (CMS, 2011c).

The potentially preventable readmission as suggested by Goldfield (2008) was caused by poor inpatient treatment or poor care coordination upon discharge. Classen et al. (2011) found that daily about 1 in every 20 patients acquired an infection while under hospital care. Classen et al. (2011) continued to note that one in seven Medicare beneficiaries is harmed, and nearly 20% are discharged and readmitted within 30 days.

These types of results, private studies as well as culling through the Medicare claims data, led CMS to the realization that implementing a fiscally sound relationship with hospitals to "gate keep" the patient following discharge would help keep patients in the right setting for care at a reasonable cost. Just as Stevens (2008) had suggested that funding was needed for this new type of collaborative intervention processes, CMS developed such a program, titled CCTP (CMS, 2011d). Through a CBO, hospitals and

other providers would be reimbursed for the added cost of working with the patients and their communities to reduce PPRs, improve patient experiences, reduce costs, and ensure the patient received the right care at the right time in the right setting for a reasonable cost.

Maryland Readmissions

Maryland is a waivered state in which CMS provides dollars necessary to manage the Medicare and Medicaid programs within the governance of the state (HSCRC, 2011a). The state must still meet patient outcome guidelines within the CMS programming, such as quality of care and patient safety for a reasonable cost. CMS gave HSCRC broad responsibilities to ensure that the state cares for its citizens with reasonable levels of services and costs, as compared to Medicare. These guidelines include staying within predetermined costs of care and quality as described in the following:

> In recent years, the HSCRC has devoted considerable resources toward the development and implementation of payment-related initiatives designed to promote the overall quality of care in Maryland hospitals. Maryland remains the only state to retain such a system. The market for health care services in the United States has failed to produce results consistent with the Maryland legislature's founding goals. The Maryland system shows that a "macro-oriented" approach to regulation, which seeks to correct only for the most obvious market failures, can assist policy-makers in controlling cost growth and, at the same time, enhancing access to care. (HSCRC, 2001a, para.1)

HSCRC staff paid attention to the hospital quality measures and as CMS, HSCRC staff developed fiscal incentives that attempted to improve the overall quality of Maryland's hospital care (HSCRC, 2011b). HSCRC Quality Initiatives had a three-pronged approach to setting quality metrics: (a) process care measures, (b) complication reductions, and (c) readmission reductions (HSCRC, 2011b). Another new program to meet these quality initiatives was the Admission-Readmission Revenue (ARR) Hospital Payment Constraint Program (HSCRC, 2011d). Once fully implemented the ARR program will be expected to produce improved postdischarge coordination of care resulting in a reduction of all cause readmissions.

The HSCRC staff and hospitals have not ventured into the type of program that CMS identified as the CCTP. The HSCRC Quality Initiatives resembled the CMS overall goals of reducing costs while increasing quality through providing appropriate care in the right setting (HSCRC, 2011b). As identified by the HSCRC staff, the quality initiatives had some marked improvements in the state of Maryland over the past years (HSCRC, 2011b). Because HSCRC's mission was the management of inpatient stays, the focus on readmissions was becoming critical to continued quality successes (HSCRC, 2011d). Like CMS, HSCRC offered financial incentives to implement the admission-readmission revenue (ARR) program to reduce readmissions and increase quality (HSCRC, 2011d). Unlike CMS, HSCRC had not offered to cover the cost of new initiatives to help the patients stay out of the hospital following a discharge (HSCRC, 2011b). CMS, through CCTP funding, identified the need to offer the financial incentives to cover the cost of

hospitals or other players in the CBO to gate keep services offered in the care transition for patients (CMS, 2011d).

In the CMS documentation of readmissions throughout the country, CMS identified nine of the 60 hospitals in Maryland as high readmitting hospitals, in other words, in the fourth quartile of readmissions (CMS, 2011b). Those hospitals identified in this report are considered eligible for additional funding to support the efforts of implementing care transition programs to reduce PPRs (CMS, 2011d). In Maryland, those nine hospitals have an opportunity to work with HSCRC as ARR hospitals, as well as a CBO in the CCTP program to reduce PPRs and create improved quality of services for their patients (personal communication, Mary Beth Pohl, November 2, 2011).

Prince George's Health Care Position

There are nine hospitals, four of which are in Prince George's County (CMS, 2011b). These nine hospitals are in CMS's readmission fourth quartile, and considered hospitals that require improvements or suffer fiscal penalties in 2012 when CMS plans to reduce reimbursement based on the level of readmissions (CMS, 2011d). Although Maryland is a waivered state under the CMS regulations (HSCRC, 2011a) and the hospitals will not experience this type of direct Medicare payment reduction, HSCRC does currently have a quality payment factor that affects each hospital in order to maintain Maryland's waiver state position (HSCRC, 2011b). It is in the best interest of each hospital in Prince George's County, as well as the entire state of Maryland, to work on reducing PPRs so that the waivered state position is renewed each year by CMS

(HSCRC, 2011a). In prior years, the quality and cost data from HSCRC (2011b) reflected issues in Prince George's County hospitals.

In 2009, the Prince George's commissioners contracted with RAND to prepare an analysis of the health care programs in the county (Lurie et al., 2009). This report summarized that the hospitals in Prince George's County fell below many standards but that the county had enough hospitals. The report found that the number of primary care physicians and clinics per capita was not adequate, as compared to the surrounding jurisdictions. Other quality findings included: (a) poor clinical measurements as compared to U.S. averages, (b) all hospitals fell below Maryland averages on the delivery of beta-blocker, and (c) worse results on reported quality indicators.

The report (Lurie et al., 2009) fell short of suggesting that the issues with the hospitals' quality were directly related to the lack of community support on the outpatient basis. This research study attempted to fill in this literature gap by associating community support services within the state of Maryland to identify whether the Prince George's County hospitals are at the mercy of those quality findings when trying to reduce PPRs. This research study also reviewed the concepts that with fewer primary care physicians and clinics, the hospitals in Prince George's County are becoming the outpatient centers for many patients, thus producing higher admissions per capita. The review of literature on this phenomenon was performed.

Prince George's County Readmissions

The Dartmouth report (Goodman et al., 2011) noted evidence suggests that in communities where the hospital was considered a site of outpatient care and there is a

high admissions rate, there will be a pattern of high readmissions. Further review might even suggest that the more constraint on inpatient bed turnover, the more likely the patient could be readmitted. Fisher, Wennberg, Stukel, and Sharp (1994) found this pattern of clinical judgments on discharges were a result of bed availability, in other words, discharge quickly when more patients are awaiting admission. The Lurie et al. study (2009) showed that the number of inpatient beds and emergency room spaces per capita in Prince George's County were both the third highest of the five regions measured. Without a shortfall in inpatient beds and emergency room spaces, the patients may find that the use of the emergency room is better for their outpatient treatments than a private doctor's office. More admissions will result in more readmissions (Goodman et al., 2011). A further study of the factors in Prince George's County as compared to the nation was necessary to locate issues that affected PPRs.

Lurie et al. (2009) compared the following against national benchmarks: (a) physician shortages across Maryland, (b) physicians spent less time providing care, (c) aging physician populations, (d) rising malpractice costs, and (e) low compensation. Continued review of the aging physicians, by specialty, showed that these trends would only worsen. State leaders and county commissioners face a daunting task if they want to change this trend because the emergency room could become the outpatient treatment center when physicians are not available (Fisher, 1994). As previously noted, more emergency room visits resulted in more readmissions when beds are available (Lurie et al., 2009).

An examination of today's hospital beds, the hospital emergency room spaces, the physicians, and other community services on a per capita basis may help to fill the literature gap on the internal and external reasons for PPRs in Prince George's County. Another critical factor to consider may be the income levels of the citizens of Prince George's County because the hospital emergency rooms do not require payment or insurance, while a private physician's office does. This study may help to fill in the gap or add findings to the body of knowledge as to why all four hospitals in Prince George's County are in CMS's fourth quartile of high readmissions.

Trends in the Literature

Even before Fisher et al. (1994) studied the effects of hospital readmissions in Boston and New Haven, others reviewed readmissions. Their focus was on why one jurisdiction experienced more readmissions then another, taking into account severity of illness levels. Over these past decades, with additional electronic data available on billed claims, severity of illness, injuries and complications, and community services, more scholars focused on readmissions from a quality of care perspective and not just a bed or emergency room availability perspective. In the case of Prince George's County, not losing site of all the above-mentioned reasons was critical to identify care transition programs to reduce PPRs. Lurie et al. (2009) identified pervasive problems with patient care after hospital discharge. Their data reflected lower readmissions when there was early clinician follow-up and care coordination among providers. What the study did not focus on was the collaborative interventional approach to include all players in the access

to care model. This research study focused on these components of reducing PPRs in Prince George's County.

Literature in the future will follow the path of understanding quality of services as seen in CCTP (CMS, 2011d). As more hospitals and CBOs take on the role of gatekeeper post-discharge, the anticipation of improved quality at a lesser cost per beneficiary is expected. The efforts in Prince George's County to understand how an entire county fails to meet so many quality initiatives is another example of where the literature might focus on in the future.

Summary

Chapter 2 began with a rationale and overview of the theoretical framework that tied general systems theory (GST) to the continuum of care. GST brings together closed system players with the environment to form the open system of delivery of care. Understanding that the providers of direct care are not the only factors affecting the patient's continuum of care is important if one is to add to the body of knowledge on the effects of PPRs on the health care system.

Next, the chapter reviewed the CMS history on the ACA's Triple Aim. A review of the three components and the affect on outcomes was presented. This section discussed types of services that CMS was interested in when (a) a system developed an ACO or (b) a system was approved for a demonstration project under the care transition program. Finally, this section reviewed two major health systems and their challenges to being granted an ACO status under the ACA program.

This chapter described the current scholarly literature on the discharge planning processes that is initiated in the hospital and expanded to the community dwelling. The goal achieved was fewer readmissions and improved quality of life for the 65-year and older patients. The focus was not just the day of discharge, but also the interactions between the patients, their caregivers, and the community at-large so that the patients could remain in their dwellings. The community consisted of the providers of care and community support services. The results of the literature presented were that patients with interventions were able to self-manage their care needs at home with fewer PPRs and improved quality of life.

The governmental literature presented described efforts to identify reasons for readmissions whether due to the number of available inpatient beds to the lack of adequate community resources. Whether due to poor discharge planning or the lack of community support, Prince George's County was unique in the state of Maryland because all its hospitals were on the CMS listing of high readmitting facilities. The County and the hospitals have to find the reasons for this problem and work toward finding solutions, or suffer fiscal penalties, and more importantly, continue to affect the health and well-being of its citizens.

In Chapter 3, I provide an overview of my research methodology. A further description of the salient components of my research is presented. The sampling population and procedure, the research design, the research procedures, and the instruments used for data collection and analysis are described.

Chapter 3: Research Method

Introduction

An examination of the types and levels of community support services offered in each county in Maryland may help to identify why Prince George's County has the highest PPR rate. Although studies have become more prominent on the processes of reducing PPRs, there remains little research on the correlation between the types and levels of community support services and the reduction of PPRs. This study examined this correlation in Prince George's County by identifying similarities and differences in community services and PPRs among Maryland's counties. This chapter describes the quantitative research method, a correlation that will be used in this study of PPRs.

This study will be a relational or a correlational study, because it will "identify how one or more variables are related to one another" (McNabb, 2008, p. 98). The quantitative method "may be exploratory, descriptive, or causal" (McNabb, 2008, p. 111). The exploratory study includes small sample sizes due to the time and money necessary to do a larger study. These smaller studies then offer opportunities of future studies to continue to build upon the common knowledge. The descriptive study represents a moment in time of the sample data. The causal study looks for dependent and independent relationships, and may be relational or experimental (McNabb, 2008). As previously presented in Chapter 1, the purpose of this study was to explore the correlation of types and levels of community support services in Prince George's County and other counties in Maryland for identification of factors to assist in the reduction of PPRs. The conceptual framework is based on the field model of health and well-being (Evans &

Stoddart, 1994) as seen in Appendix C. Secondary data collected by the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute (RWJF) on the County Health Rankings website, and readmission data collected by CMS were utilized in this study. All secondary sources produced interval data that can be used to show relationships among the factors. These data were analyzed using multiple regression and correlational analysis. The *t* test multiple regressions was used to show whether there was a strong, significant relationship between dependent PPR rates and independent types and levels of community support services. The results could be used by Prince George's County Commissioners to develop and promote community health with the hospitals in Prince George's County in order to reduce PPRs with respect to the independent variables described in the County Health Rankings website.

This chapter describes the research methods used to examine the study's problem. The quantitative method was used to test the research question and hypothesis. Sections of this chapter include research method, research design and approach, setting and sample, data collection, analysis, categorical variables, instrumentation and materials, validity and reliability, and protection of human rights.

Research Design and Approach

The overarching research question for this study asked how the types and levels of community support services in Prince George's County aid in affecting the PPR rates as measured by CMS's claims discharged data. The five subquestions were as follows:

RQ1: Does the County Health Rankings' quality of care reported data on ineffective patient education upon discharge affect PPRs?

RQ2: Does the County Health Rankings' access to care reported data on the lack of outpatient drug prescriptions and providers affect PPRs?

RQ3: Does the County Health Rankings' social and economic factors reported data on the lack of inadequate community support services affect PPRs?

RQ4: Does the County Health Rankings' health behaviors reported data on patient's inability to comply with directives affect PPRs?

RQ5: Do all of the variables together (County Health Rankings' data on ineffective patient education upon discharge, lack of outpatient drug prescriptions and providers, the lack of inadequate community support services, and the patient's inability to comply with directives) affect PPRs?

To answer the research questions and test their corresponding hypothesis, I used a nonexperimental correlation research design (Salkind, 2010). I chose the nonexperimental design because I was not manipulating the secondary data but instead exploring relationships. Selecting the right research design builds confidence in the results for the reader (Trochim & Donnelly, 2008; Wright et al., 2004). Those in public administration positions who might utilize the information from this study might greater than average confidence because sufficient information is required to interpret and replicate the circumstances to make the necessary improvements to society (Norusis, 2008; Wright et al., 2004).

The purpose of this proposed study was to evaluate the theory that types and levels of community support services assist hospitals in reducing readmission rates. Correlation in other counties between community services and readmissions would

indicate Prince George's County readmission rates for the four hospitals cannot be reduced without having, as a minimum, the equivalent community support services. A correlation, a common approach to quantitative studies, measures relationships between two variables (Trochim & Donnelly, 2008). The use of a qualitative research study approach would not be appropriate such studies are based on words not numbers, on exploration not connections (Trochim & Donnelly, 2008). This study focused on relationships among numerical data provided by secondary sources, CMS and County Health Rankings.

This study was performed to document, from the perspective of the field model of health and well-being (Evans & Stoddart, 1994), that delivery of health care services requires that the patients' communities are part of the delivery system to ensure that Medicare high-risk beneficiaries can remain out of the hospital, thus reducing PPRs. An evaluation of the relationship between types and levels of community support and PPR rates was the purpose of this research study. Literature demonstrated that the lack of appropriate community support services will increase the levels of emergency room visits resulting in increased rehospitalizations (Jack et al., 2009). The County Health Rankings data presented by the RWJF was a summary of specific behavior factors related to health care and is a publicly available. The CMS data were a summary of readmissions without any intent to identify reasons for the readmissions.

Setting and Sample

This research focused on the public Medicare high-risk beneficiaries served in the five Prince George's County hospitals in 2009. The CMS and public County Health

Rankings data were utilized to compare types and levels of community support services with the PPRs for each of the four hospitals in Prince George's County and the other counties in Maryland. CMS data, expected to be more than 60,000 Medicare discharges, was the source for the PPR data and the County Health Rankings site was the source for the community data. CMS collected its readmission data through the analysis of Medicare high-risk patient claims processed for payments to all U.S. hospitals. CMS summarized its data by county (CMS, 2011d). RWJF collected the County Health Rankings data that were used to display the community information. RWJF collected its county data from the county staff throughout the United States (Robert Wood Johnson Foundation & Institute, 2011).

The patient claims data included dates of service and diagnosis or severity of illness to calculate the levels of readmissions for three specific diagnoses: heart failure, heart attacks, and pneumonia (CMS, 2011b). The community information included specific factors of demographics about the citizens and the community's health support services, both directly related to healthcare, such as mortality, morbidity, health behaviors, and clinical care and indirectly related to healthcare, such as socioeconomic factors and physical environments. These secondary sources are available on public web sites.

Data Collection and Analysis

Data collection and analysis are fundamental aspects of a scholarly research paper (*Publication Manual of the American Psychological Association*, 2009). Missing data or inaccurate data could be detrimental to the results. The general principal is to provide

readers with enough detail to help them understand the project and results with a level of confidence.

Data Collection

Data collection for this study was based on CMS and the County Health Rankings. The selected population was the high-risk Medicare beneficiaries with three specific diagnoses: heart attacks (AMI), heart failure (HF), and Pneumonia (Pneu). The CMS data were collected using 53,229 Maryland claim data from 2008-2011. The County Health Rankings used data available during the time of this research study on 5,828,289 Maryland residents. The Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute assembled these Rankings for each state's counties from data provided by the states.

Data Analysis

The data were collected from the public websites of CMS and County Health Rankings and no permission was needed to gather the data for this study. Two peers in health care performed checks for accuracy of the selection of the data to ensure reliability. The results were documented into the Statistical Package for the Social Sciences (SPSS) software (McNabb, 2008). A statistical analysis was performed to develop the correlational study between two interval scale levels: PPR rates per county and specific behavioral factors per county.

In an attempt to correlate per county the community data as presented in the County Heath Rankings website and the PPR rates for the high-risk Medicare beneficiaries in the CMS website, I used simple multiple regressions. Multiple

regressions show the linear relationship between a dependent variable and one or more independent variables, plus the error term that is "the difference between the observed score and a predicted score" (Knoke, Bohrnstedt, & Mee, 2002, p. 173). In social sciences, the linearity assumptions are most common per Knoke et al. (2002). In this study, the dependent variable was PPRs and the independent, or causal role variance, was the community support services identified in the County Health Rankings. A correlational study for each county between its dependent variable and the specific independent variables was performed. The purpose of this study was to evaluate the theory that types and levels of community support services assisted hospitals in reducing readmission rates.

The primary research question asked how the community support services affected the levels of PPRs differently for Prince George's County than for other counties in Maryland. The five proposed subquestions were as follows:

RQ1: Does the County Health Rankings' quality of care reported data on ineffective patient education upon discharge affect PPRs?

H_1^0: County Health Rankings' quality of care reported data on ineffective patient education upon discharge do not affect PPRs.

H_1^A: County Health Rankings' quality of care reported data on ineffective patient education upon discharge do affect PPRs.

RQ2: Does the County Health Rankings' access to care reported data on the lack of outpatient drug prescriptions and providers affect PPRs?

H_2^0: County Health Rankings' quality of care reported data on the lack of outpatient drug prescriptions and providers do not affect PPRs.

H_2^A: County Health Rankings quality of care reported data on the lack of outpatient drug prescriptions and providers do affect PPRs.

RQ3: Does the County Health Rankings' social and economic factors reported data on the lack of inadequate community support services affect PPRs?

H_3^0: County Health Rankings' social and economic factors reported data on the lack of inadequate community support services do not affect PPRs.

H_3^A: County Health Rankings' social and economic factors reported data on the lack of inadequate community support services do affect PPRs.

RQ4: Does the County Health Rankings' health behaviors reported data on patient's inability to comply with directives affect PPRs?

H_4^0: County Health Rankings' health behaviors reported data on patient's inability to comply with directives do not affect PPRs.

H_4^A: County Health Rankings' health behaviors reported data on patient's inability to comply with directives do affect PPRs.

RQ5: Do all of the variables together (County Health Rankings' data on ineffective patient education upon discharge, lack of outpatient drug prescriptions and providers, the lack of inadequate community support services, and the patient's inability to comply with directives) affect PPRs?

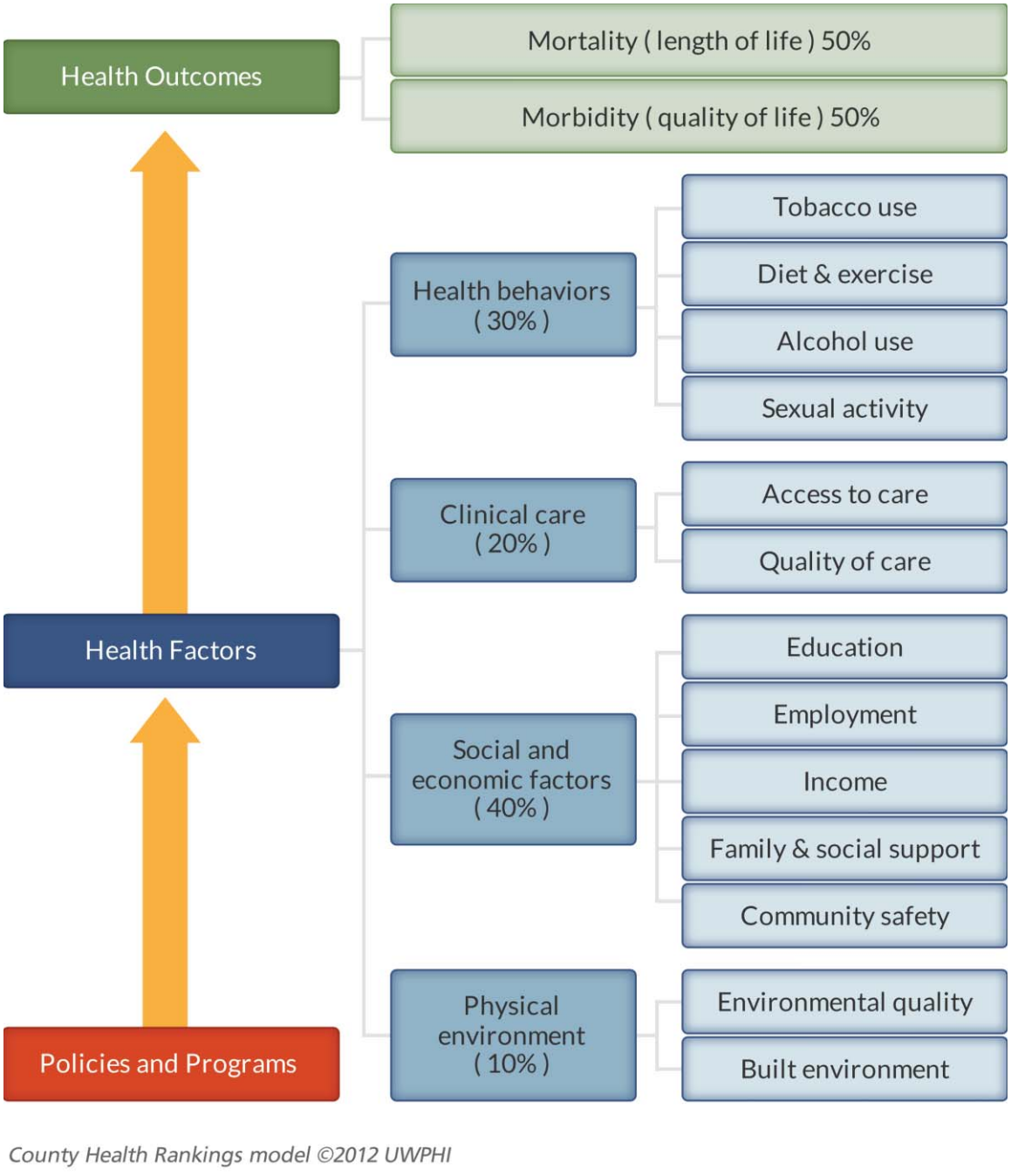
H_5^0: County Health Rankings' data on ineffective patient education upon discharge, lack of outpatient drug prescriptions and providers, the lack of

inadequate community support services, and the patient's inability to comply with directives do not affect PPRs.

H_5^A: County Health Rankings' data on ineffective patient education upon discharge, lack of outpatient drug prescriptions and providers, the lack of inadequate community support services, and the patient's inability to comply with directives do affect PPRs.

The independent variables are displayed in Table 1. The independent variables are submitted by the counties throughout the United States for the public to be able to compare and contrast the measures. The measures are factors within the community such as health factors, life style factors, and social and economic factors.

Table 1
Independent Variables



Note: From Robert Wood Johnson Foundation, & Institute, University of Wisconsin Population Health Institute. (2011). County Health Rankings, from http://www.countyhealthrankings.org. Copyright 2012 by County Health Rankings. Copied from public website.

Some of the dependent variables are displayed in Table 2. The dependent variables are the readmission rates for AMI, HF, and PNEU per county. All other counties are in the first three quartiles and were requested from CMS's web site at the time of the study.

Table 2

Dependent Variables (State of Maryland) - Fourth Quartile

Hospital Name	County Name	30-Day AMI	30-Day HF	30-day PNEU
University of Maryland Medical Center	Baltimore City	22.3	27.4	21
Prince Georges Hospital Center	Prince George	22	28.5	
Franklin Square Hospital Center	Baltimore	21.8	28.3	
Montgomery General Hospital, Inc.	Montgomery	21.1	30.2	
Johns Hopkins Bayview Medical Center	Baltimore City	23		22.5
Civista Medical Center	Charles		28.8	21.4
Doctors' Community Hospital	Prince George	20.7	28.6	
Southern Maryland Hospital Center	Prince George	22.2		22.8
Fort Washington Hospital	Prince George		27.8	20.2

Note. From "*High readmission hospitals: fourth quartile hospitals by state*," Baltimore, Maryland, http://www.cms.gov/DemoProjectsEvalRpts/downloads/CCTP_FourthQuartileHospsbyState.pdf. Copyright 2010 by CMS. Adapted from public website.

The 24 counties in Maryland are displayed in Table 3. The research study utilized all of these counties' CMS data and County Health Rankings data. This chart is in alphabetical order and not in any level of PPR order.

Table 3

Counties in Maryland

1. Allegany
2. Anne Arundel
3. Baltimore
4. Baltimore City
5. Calvert
6. Caroline
7. Carroll
8. Cecil
9. Charles
10. Dorchester
11. Frederick
12. Garrett
13. Harford
14. Howard
15. Kent
16. Montgomery
17. Prince George's
18. Queen Anne's
19. Somerset
20. St. Mary's
21. Talbot
22. Washington
23. Wicomico
24. Worcester

Note. From "About HSCRC. Health Services Cost Review Commission," from http://www.hscrc.state.md.us. Copyright 2013 by HSCRC. Adapted from public website.

Instrumentation and Materials

Secondary data were utilized in this study. The first set of secondary data were collected from the County Health Rankings web site to identify the community, its

demographics, and its public services. This web site was produced through a project titled Mobilizing Action Toward Community Health (MATCH) through which The RWJF and the University of Wisconsin tried to show that where people live affects their health (Robert Wood Johnson Foundation & Institute, 2011). The County Health Rankings was the title of the web site that stores the county data. The County Health Rankings' specific measurements of health behaviors, clinical care, social and economic, and physical environments were correlated to the CMS readmission data (Robert Wood Johnson Foundation & Institute, 2011). RWJF updates the data from the states frequently and documents the time of updates. RWJF had data from 2010 to current for Prince George's County and the other counties of Maryland.

The second set of secondary data were collected by CMS using the 2012 patient claims data submitted by providers when demanding payment for services. The data used in this study was summarized by CMS under its Community-Based Care Transition Program, a demonstration initiative to reduce PPRs (CMS, 2011d). All data used in this research study are available in the two public domains: CMS and County Health Rankings. No patient identifiers were used in this study.

Validity and Reliability

Knoke et al. wrote that "the instrument's validity denotes the extent to which it measures what it is supposed to measure" (2002, p. 411). Reliability is defined as the consistency of providing "the same result over and over again assuming the underlying phenomenon is not changing" (Trochim & Donnelly, 2008, pp. 80-82). The results of this research study are to bring confidence to the subject matter (Wright et al., 2004).

The County Health Rankings' specific measurements were marked against the levels of PPRs per county in Maryland resulting in areas of similarities and differences. Tables and graphs identifying types and levels of community support services were charted against the PPRs. Maryland counties were compared to Prince George's County to identify possible reasons for the differences in PPR rates. A limitation was that the data collected and compared were by county and not by hospital. The hospitals could have other issues that affect PPRs, such as management or cost factors. For this study, the uniqueness of the hospitals in Maryland was not incorporated.

Scholars assemble the types and levels of community data from public source documents, and the PPR rankings are assembled from reliable CMS paid claims data. Although the secondary data were not tested for validity and reliability by this researcher, they were public data and easily assessable for replicability (McNabb, 2008). These secondary data are used by many experts in the health care field for the study of healthcare costs throughout the nation, which lends them to continual scrutiny, resulting in validity and reliability.

Protection of the Participants Rights

Institutional Review Board (IRB) approval was necessary for a research study that involves human participation. The data were not selected or analyzed prior to the approval of Walden's IRB (IRB# 03-28-14-0161517). The purpose of the IRB approval was to protect all participants in the study, including the researcher, and to ensure no harm, either physical or mental, to any participant.

No adverse effects for any beneficiary, county, or participants resulted from this study. As with all studies of public data, there are potential effects or issues (Trochim & Donnelly, 2008). Secondary data provided on public sites were used in this research study. No patient identifiers were used in this study. Anonymity was a strong guarantee of privacy for the individual patients in the public data, but not for the counties in this study (Trochim & Donnelly, 2008). The counties and hospitals were identified in both sources of secondary data. Each county and hospital administration understood that its data could be made public at the time of submission to CMS or RWJF. The researcher will not be required to destroy any data because the researcher did not create any new data from surveys or other collection tools.

Summary and Transition

The understanding of the components of the study is critical for the reader to comprehend the possible improvements that could be forthcoming from a public administration study (Wright et al., 2004). In Chapter 3, a description of the independent variables from county health rankings and the dependent variables from CMS were presented. The method for data collection and analysis were discussed. The statistical formulas that will be used in this study were described, including the plans to ensure validity and reliability as well as to protect human rights.

In Chapter 4, the research question and each of the subquestions associated with PPRs and community support services will be considered using nonexperimental correlation multiple regressions. This chapter includes a description of the research

instrument. The results for each subquestion and a summary of findings are described in the chapter.

Chapter 4: Results

The purpose of this quantitative research study was to determine if there was a relationship between PPRs and the types and levels of community support services in Prince George's County as compared to other counties in Maryland. The focus was on the readmissions that are preventable, in order to reduce adverse patient outcomes and financial waste (Goldfield, 2008). This nonexperimental, correlation, multiple regression study used secondary data (from CMS County Health Rankings) to see whether community support services affected the levels of PPRs differently for Prince George's County than for other counties in Maryland. The study reviewed possible county differences that could be addressed by Prince George's County officials to improve health care experiences for their citizens. The research question and related hypotheses for this study were as follows:

The primary research question asked how the community support services affected the levels of PPRs differently for Prince George's County than for other counties in Maryland. The five subquestions are as follows:

RQ1: Does the county health rankings' quality of care reported data on ineffective patient education upon discharge affect PPRs?

H_1^0: County health rankings' quality of care reported data on ineffective patient education upon discharge do not affect PPRs.

H_1^A: County health rankings' quality of care reported data on ineffective patient education upon discharge do affect PPRs.

RQ2: Does the county health rankings' access to care reported data on the lack of outpatient drug prescriptions and providers affect PPRs?

H_2^0: County health rankings' access to care reported data on the lack of outpatient drug prescriptions and providers do not affect PPRs.

H_2^A: County health rankings access to care reported data on the lack of outpatient drug prescriptions and providers do affect PPRs.

RQ3: Does the county health rankings' social and economic factors reported data on the lack of inadequate community support services affect PPRs?

H_3^0: County health rankings' social and economic factors reported data on the lack of inadequate community support services do not affect PPRs.

H_3^A: County health rankings' social and economic factors reported data on the lack of inadequate community support services do affect PPRs.

RQ4: Does the county health rankings' health behaviors reported data on patient's inability to comply with directives affect PPRs?

H_4^0: County health rankings' health behaviors reported data on patient's inability to comply with directives do not affect PPRs.

H_4^A: County health rankings' health behaviors reported data on patient's inability to comply with directives do affect PPRs.

RQ5: Do all of the variables together (county health rankings' data on ineffective patient education upon discharge, lack of outpatient drug prescriptions and providers, the lack of inadequate community support services, and the patient's inability to comply with directives) affect PPRs?

H_5^0: County health rankings' data on ineffective patient education upon discharge, lack of outpatient drug prescriptions and providers, the lack of inadequate community support services, and the patient's inability to comply with directives do not affect PPRs.

H_5^A: County health rankings' data on ineffective patient education upon discharge, lack of outpatient drug prescriptions and providers, the lack of inadequate community support services, and the patient's inability to comply with directives do affect PPRs.

This chapter describes the results of the analyses performed using SPSS to address each of the research subquestions to see how the community support services affected levels of PPRs. First, descriptive statistics are provided by county from County Health Rankings and CMS. Then, using multiple regressions, the study addresses each subquestions. The results are summarized at the end of the chapter.

Research Instrument

The secondary data selected from the websites of CMS and County Health Rankings required accuracy and validation by peers before the data could be loaded into SPSS for analysis. The CMS data were from the 2010 patient claims and the County Health Rankings were from 2013 county submissions. Initially, I developed an instructional manual to assist my peers in validating whether I selected the data correctly from each website. This instructional manual is in Appendix D.

The second step in the data collection process was to email the instructional manual to seven peers and a copy to my study's chair. Within the allotted timeframe,

three peers responded with one completing the entire review. The second peer did not have enough space on her computer to complete the review. The third reviewer completed the validation a week later. A fourth peer apologized for the delay and volunteered to assist with future requests. Peers five, six, and seven never responded. With one validation received, I began to set up my data in SPSS.

Peer review was necessary for two reasons. First, because I work in the health care industry, I wanted to reduce the appearance of bias. Second, the secondary data needed alignment because the CMS PPR data were by hospital and the County Health Rankings behavioral data were by county. An assignment of each hospital to the appropriate county was necessary before data could be loaded into SPSS. This alignment was done with the use of the State of Maryland's web site.

The third step was the preparation of the downloaded data for uploading to SPSS was assigning the County Health Rankings behavioral data to each hospital. Using Excel, each hospital's CMS PPR data were downloaded from the CMS website. Then, each hospital received the appropriate County Health Rankings behavioral factors. Hospitals in the same county will have the same County Health Rankings behavioral factors but their own unique CMS PPR data. The Excel workbook resulted in 44 lines, one for each hospital, and 243 columns of behavioral data. I color-coded the columns based on their assignment to one of the four subquestions. The fifth research question was a consolidation of all behavioral data points.

The Excel data were uploaded to SPSS and SPSS labels were written with the intent of identifying each research sub question within the SPSS data set. The County

Health Rankings behavior data included more data than necessary for this study, so a matrix of data to be used in this study was developed. This matrix is in Appendix E. This matrix includes three sections, one for each PPR identified by CMS. It also includes the SPSS tools that were used in the study: descriptive statistics scatter plot, ANOVA F-Test, and finally multiple regressions. This study was performed following the Walden University Institutional Review Board's guidance.

Descriptive Statistics

The secondary data selected from the web sites included 44 hospitals and 21 counties. Table 4 depicts the demographic data from County Health Rankings categories for the 44 hospitals. The categories have similarities among counties, such as environmental quality, and other categories have vast differences, such as teens birth rates and violate crimes. Drinking safe water only has 33 respondents. The coding before the description assisted with the assignment of the behavior factors to each research sub question.

Table 4

4a. Descriptive Statistics for County Health Rankings Behavioral Data: Access to Care

		N	Minimum	Maximum	Mean	Std. Deviation
XCa	Access to Care	44	3	3	3	0
XCa1	Uninsured	44	9	17	13.52	2.758
XCa2	Primary care physicians	44	34	173	84.25	32.662
XCa3	Dentist Rate	44	28	103	57.2	19.387
XCa4	Could not see doctor	44	7.6	18.4	11.7932	2.59807
XCa5	Uninsured adults	44	10.4	20.9	16.4023	3.40202
XCa6	Uninsured children	44	4.1	7.4	5.4682	0.84214

4b. Descriptive Statistics for County Health Rankings Behavioral Data: Quality of Care

		N	Minimum	Maximum	Mean	Std. Deviation
XCb	Quality of Care	44	3	3	3	0
XCb1	Preventable hospital stays rate	44	42	99	66.27	13.952
XCb2	Diabetic screening	44	80	89	83.16	2.787
XCb3	Mammography screening	44	63	77.7	67.182	3.5347

4c. Descriptive Statistics for County Health Rankings Behavioral Data: Health Behaviors

		N	Minimum	Maximum	Mean	Std. Deviation
XH	Health Behaviors	44	2	3	2.86	0.347
XHa	Alcohol Use	44	3	3	3	0
XHa1	Excessive drinking	44	9	19	14.93	2.645
XHa2	Motor vehicle crash death rate	44	15	794	343.114	225.86333
XHd	Diet and Exercise	44	3	3	3	0
XHd1	Adult obesity	44	18	40	28.93	4.839
XHd2	Physical inactivity	44	17	32	25.86	4.873
XHs	Sexual Activity	44	3	3	3	0
XHs1	Sexually transmitted infections	44	130	1328	598.2	458.176
XHs2	Teen birth rate	44	170	10929	5025.82	4184.651
XHt	Tobacco Use	44	3	3	3	0
XHt1	Adult smoking	44	9	25	18.61	5.418

Table 4 Continues

4d. Descriptive Statistics for County Health Rankings Behavioral Data: Health Outcomes

	N	Minimum	Maximum	Mean	Std. Deviation
XO Health Outcomes	44	-1.42	2.68	0.4805	1.40079
XOl Mortality	44	1	5	3.23	1.217
XOq Morbidity	44	2	4	3.16	0.645
XOq1 Low birth weight	44	6.8	12.7	9.552	2.0781
XOq2 Poor or fair health	44	8	19	14.09	3.536
XOq3 Diabetes	44	6.9	13.9	10.1273	1.70912

4e. Descriptive Statistics for County Health Rankings Behavioral Data: Physical Environmnet

	N	Minimum	Maximum	Mean	Std. Deviation
XP Physical Environment	44	3	3	3	0
XPb Built Environment	44	-0.1	0.07	0.0125	0.03989
XPb1 Access to recreational facilities	44	3.8	21.1	10.525	4.6021
XPb2 Limited access to healthy foods	44	0	16	3	2.861
XPb3 Fast food restaurants	44	33	72	59.11	9.148
XPb4 Commuting alone	44	59.51	83.74	71.3843	9.41153
XPb5 Access to Parks	44	5	84	49.64	27.835
XPe Environmental Quality	44	-0.04	0.12	0.0039	0.02345
XPe1 Daily fine particulate matter	44	12	13	12.514	0.2258
XPe2 Drinking water safety	33	0	21	1.303	3.9881

4f. Descriptive Statistics for County Health Rankings Behavioral Data: Social Economic

	N	Minimum	Maximum	Mean	Std. Deviation
XS Social Economic Factors	44	2	4	3.14	0.632
XSe Factor Education	44	3	3	3	0
XSe1 High school graduation	44	66	93	79.89	9.438
XSe2 Some college post secondary education	44	36.4	83	63.082	9.266
XSf Family and Social Support	44	-0.06	0.15	0.0375	0.07317
XSf1 Emotional Support In adequate social support	44	15	29	21.57	4.786
XSf2 Children in single parent households	44	19	65	39.59	16.508
XSi Income	44	-0.12	0.23	0.0284	0.13319
XSi1 Children in poverty	44	7	36	19.27	11.019
XSi2 Household cost	44	1	6	4.02	1.911
XSi3 Household income	44	1	5	3.27	1.246
XSu Employment	44	3	3	3	0
XSu1 Unemployment	44	5.1	12.2	7.973	2.026
XSu2 Children eligible for free lunch	44	12.48	76.4	42.6759	22.01886
XSu3 High housing costs	44	27.24	44.94	38.7552	5.26536
XSv Community Safety	44	-0.04	0.18	0.0452	0.08525
XSv1 Violent crime rate	44	210	1542	732.52	509.728
Valid N (listwise)	33				

Table 5 identifies the CMS PPR data of all the hospitals and shows that some hospitals have a range of readmissions, from none to as high as 1.2096 for acute

myocardial infarction. heart failure and pneumonia readmission rates range from slightly less than 1.0 to more than 1.2. All three diagnoses have a maximum of above 1.2 for readmissions.

Table 5

Descriptive Statistics for CMS Excess Readmission Ratios

	N	Minimum	Maximum	Mean	Std. Deviation
Yar acute myocardial infarction excess readmission Ratio	44	.0000	1.2096	.888525	.3969189
Yhr heart failure excess readmission ratio	44	.9245	1.2120	1.049673	.0697420
YPr pneumonia excess readmission ratio	44	.8971	1.2695	1.077120	.0860365

This study was an attempt to show the relationships between the County Health Rankings Behavioral Data and the CMS data by using scatter plots, ANOVA and F ratio, and multiple regressions for each of the five research subquestions. For data that are linear and most common in social sciences (Knoke et al., 2002), the use of the multiple regressions to predict PPRs based on one or more of the County Health Rankings' independent variables is the statistical assumption that best fit this study. A correlational study for each county between its dependent variable and the specific independent variables was performed. The purpose of this study was to evaluate the theory that types and levels of community support services assisted hospitals in reducing readmission rates. Before reviewing each research sub question, a review of the differences between Prince George's County and all other counties is performed.

One Way Analysis of Variance (ANOVA)

The ANOVA describes variability within group means to know whether my sample means vary more than expected if the null hypothesis is true. First I examined how much the means vary within the group and then how much the sample means vary among themselves. The null hypothesis was rejected if the sample means for the two groups varied more than I expected.

The ANOVA test, the dependent continuous element is the CMS PPR data and the independent nominal element is Prince George's County and All Other Counties. Table 6 shows the results of the ANOVA for the CMS data. The F test is 3.611 and there is a probability of 0.064 (slightly greater than α .05) or 64 times in 1000, when the null hypothesis is true, the F ratio at 3.611 or greater. Therefore, the null hypothesis was rejected. It is unlikely that the PPR's means are different in Prince George's County as compared to other counties. This result suggests that the five subquestions should be studied using the scatter plots, the ANOVA tests, and the multiple regression to help identify reasons for the differences in PPRs between Prince George's County and others.

Table 6

Anova: CMS PPR data

	Sum of Squares	df	Mean Square	F	Sig.
Between groups	1,502,300.94	1	1,502,300.94	3.611	0.064
Within groups	17,475,288.94	42	416,078.31		
Total	18,977,589.89	43			

Score Interpretation

The following information is displayed by each subquestions with the attempt to respond to the research question of identifying if there exists a relationship between PPRs and behavioral factors. The results determined the behavioral factors that affect PPRs per county with an attempt to understand why four of the nine hospitals identified by CMS in the highest quartile are located in Prince Georges County. The variables were as follows: the dependent variable was CMS PPRs per hospital (Y-axis on chart). The independent: variables were County Health Rankings Behavioral Factors (X-axis on chart), the SPSS analysis, and the interpretations of results were grouped by each subquestion:

- RQ1: Does the County Health Rankings' quality of care reported data on ineffective patient education upon discharge affect PPRs?
- RQ2: Does the County Health Rankings' access to care reported data on the lack of outpatient drug prescriptions and providers affect PPRs?
- RQ3: Does the County Health Rankings' social and economic factors reported data on the lack of inadequate community support services affect PPRs?

- RQ4: Does the County Health Rankings' health behaviors reported data on patient's inability to comply with directives affect PPRs?
- RQ5: Do all of the variables together (County Health Rankings' data on ineffective patient education upon discharge, lack of outpatient drug prescriptions and providers, the lack of inadequate community support services, and the patient's inability to comply with directives) affect PPRs?

Research Subquestion 1: Quality of Care

The first research subquestion asked if the County Health Rankings' quality of care reported data on ineffective patient education upon discharge affect PPRs. The behavior factors in the County Health Rankings included XCb Quality of Care. The following subcomponents include these factors:

XCb1 Preventable hospital stays rate

XCb2 Diabetic screening

XCb3 Mammography screening

Scatter Plot for Quality of Care RQ1

A scatter plot was developed for each CMS PPR and these subcomponents as well as the overall quality of care factor. The scatter plot has a few statistical factors. The scatter plot attempts to understand the positive or negative relationships via the slope's direction, as well as reviewing the R-squared to determine a weak or strong relationship, and finally if there are any outliers that could distort the results. The scatter plots for RQ 1 are pictured in Appendix F. Table 7 lists the slope and R-square for each quality of care component.

Table 7

Slope and R-square Quality of Care

	AMI slope	R2	HF slope	R2	Pneu slope	R2
Preventative hospital stays	(2.34)	0.007	1.64	1.080	(2.68)	0.002
Diabetes screening	8.13	0.003	(5.28)	0.045	(0.02)	0.288
Mammogram Screening	(4.61)	0.002	(5.52)	0.078	(9.51)	0.153

Low R squares reflects a weak relationship between the dependent and independent variables. The closer to 100%, the more variability of the dependent variance, PPRs, is explained by the variability of the independent variables (behavioral factors). Diabetes screening has the strongest relationship with PNEU PPRs. Preventable hospital stays should be high in all categories since it is the same as PPRs, which suggests differences in PPRs based on ages and insurance carriers. This research study is using only Medicare PPR data. Next, it is important to study the analysis of variance, ANOVA, for the test of the null hypothesis.

One Way Analysis of Variance (ANOVA): Quality of Care

The ANOVA describes variability within group means to know whether a sample means varies more than expected if the null hypothesis is true. First, I examined how much the means varied within the group, and then how much the sample means varied among themselves. The null hypothesis was to be rejected if the sample means for the two groups varies more than expected. For the ANOVA test, the dependent continuous element was the County Health Rankings' quality of care and the independent nominal

element is Prince George's County and all other counties. Table 8 shows the results of the ANOVA for quality of care hypothesis: RQ 1: Does the County Health Rankings' quality of care reported data on ineffective patient education upon discharge affect PPRs?

The F test was 0.339 and probability (*p* value) was .564 (greater than α .05) or 564 times in 1000, when the null hypothesis is true, to expect to see the F ratio at 0.339 or larger. Therefore, null hypothesis was not rejected. It is unlikely that the means of the quality of care are different in Prince George's County as compared to other counties.

Table 8

ANOVA: Quality of care

	Sum of squares	df	Mean square	F	Sig.
Between groups	.002	1	.002	.339	.564
Within groups	.214	42	.005		
Total	.216	43			

Research Subquestion 2: Access to Care

The second research subquestion asks if the County Health Rankings' access to care reported data on the lack of outpatient drug prescriptions and providers affect PPRs. The behavior factors in the County Health Rankings include XCa Access to Care. The following subcomponents include these factors:

XCa2 Primary care physicians

XCa3 Dentist rate

XCa4 Could not see doctor

XCa5 Uninsured adults

XCa6 Uninsured children

Scatter Plot for Access to Care RQ2

A scatter plot was developed for each CMS PPR and these subcomponents, as well as the overall access to care factor. The scatter plots for RQ 2 are pictured in Appendix G. Table 9 lists the slope and R-square for each access to care component.

Table 9

Slope and R-square for Access to Care

	AMI		HF		Pneu	
	slope	R2	slope	R2	slope	R2
Primary care physicians	1.73	0.020	1.80	0.007	3.09	0.014
Dentists	5.24	0.066	1.50	0.002	9.44	4.528
Could not see a doctor	(0.03)	0.048	2.39	0.008	0.01	0.159
Uninsured adults	(0.02)	0.041	3.65	0.032	0.01	0.161
Uninsured children	0.09	0.034	(6.84)	0.007	0.02	0.024

Low R-squares reflects a weak relationship between the dependent and independent variables. The closer to 100%, the more variability of the dependent variance, PPRs, is being explained by the variability of the independent variables (behavioral factors). The lack of dentist has the strongest relationships with PNEU PPRs. Next, it is important to study the analysis of variance, ANOVA for the test of the null hypothesis.

One Way Analysis of Variance (ANOVA): Access to Care

For the ANOVA test, the dependent continuous element is the County Health Rankings' access to care and the independent nominal element is Prince George's County and all other counties. Table 10 shows the results of the ANOVA for access to care for hypothesis: RQ2: Does the County Health Rankings' access to care reported data on the lack of outpatient drug prescriptions and providers affect PPRs?

The F test is 15.343 and with a probability (*p* value) of .000 (less than α .05) or 0 times in 1000, when the null hypothesis is true F ratio at 15.343 or larger is expected. Therefore, the null hypothesis is rejected. It is likely that the means of the access to care are different in Prince George's County as compared to other counties.

Table 10

ANOVA: Access to Care

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.058	1	.058	15.343	.000
Within Groups	.159	42	.004		
Total	.218	43			

Research Sub Question 3: Social and Economic Factors

The third research sub question asks if the County Health Rankings' social and economic factors reported data on the lack of inadequate community support services affect PPRs. The behavior factors in the County Health Rankings include XS social and economic factors. The following sub-components include these factors:

XSe Education

XSe1 High school graduation

XSe2 Some college post secondary education

XSf Family and Social Support

XSf1 Emotional Support In adequate social support

XSf2 Children in single parent households

XSi Income

XSi1 Children in poverty

XSi2 Housing cost

XSi3 Household income

XSu Employment

XSu1 Unemployment

XSu2 Children eligible for free lunch

XSv Community Safety

XSv1 Violent crime rate

Scatter Plot for Access to Care RQ3

A scatter plot was developed for each CMS PPR and these sub-components as well as the overall social and economic factors. The scatter plots for RQ 3 are pictured in Appendix H. Table 11 lists the slope and R-square for each social and economic component.

Table 11

Slope and R-square for Social and Economic Factors

	AMI		HF		Pneu	
	Slope	R2	Slope	R2	Slope	R2
High School graduation	3.40	0.007	(2.14)	0.084	(3.79)	0.173
Some college post secondary education	0.01	0.060	1.27	2.829	(1.02)	0.012
Emotional Support In adequate social support	(0.01)	0.019	4.00	0.075	6.66	0.137
Children in single parent households	(3.06)	0.016	8.07	0.036	2.01	0.015
Children in poverty	(9.37)	0.002	1.32	0.104	2.15	0.018
Housing cost	8.67	0.013	5.28	0.155	8.04	0.235
Household income	4.64	0.059	1.83	0.003	(4.71)	0.013
Unemployment	(0.05)	0.062	(1.99)	0.003	7.80	0.034
Children eligible for free lunch	(3.13)	0.030	5.68	0.032	1.31	0.112
Violent crime rate	(8.82)	0.013	2.78	0.041	5.95	0.124

Low R squares reflect a weak relationship between the dependent and independent variables. The closer to 100%, the more variability of the dependent variance, PPRs, is being explained by the variability of the independent variables (behavioral factors). Some college has the strongest relationship with HF PPRs. Next, it is important to study the analysis of variance, ANOVA, for the test of the null hypothesis.

One Way Analysis of Variance (ANOVA): Social and Economic Factors

For the ANOVA test, the dependent continuous element is the County Health Rankings' social and economic factors and the independent nominal element is Prince Georges County and All Other Counties. Table 12 shows the results of the ANOVA for social and economic factors. The F test is .056 and you have a probability (*p* value) of .815 (greater than α .05) or 815 times in 1000, when the null hypotheses is true, you

expect to see the F ratio at .056 or larger. Therefore, you should fail to reject the null hypotheses. It is unlikely that the social and economic factors' means are different in Prince George's County as compared to other counties.

Table 12

ANOVA: Social and Economic Factors

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.013	1	0.013	0.056	0.815
Within Groups	9.599	42	0.229		
Total	9.612	43			

Research Subquestion 4: Health Behaviors

The fourth research subquestion asks if the County Health Rankings' health behaviors reported data on patient's inability to comply with directives affect PPRs. The behavior factors in the County Health Rankings include XH health behaviors. The following subcomponents include these factors:

XH Health Behaviors

XHa Alcohol Use

XHa1 Excessive drinking

XHa2 Motor vehicle crash death rate

XHd Diet and Exercise

XHd1 Adult obesity

XHd2 Physical inactivity

XHs Sexual Activity

XHs1 Sexually transmitted infections

XHs2 Teen birth rate

XHt Tobacco Use

XHt1 Adult smoking

Scatter Plot for Access to Care RQ4

A scatter plot was developed for each CMS PPR and these subcomponents as well as the overall health behaviors. The scatter plots for RQ 4 are pictured in Appendix J. Table 13 lists the slope and R-square for each health behaviors.

Table 13

Slope and R-square for Health Behaviors

	AMI		HF		PNEU	
	Slope	R2	Slope	R2	Slope	R2
Excessive drinking	(0.02)	0.034	(4.86)	0.042	(0.01)	0.158
Motor vehicle crash death rate	1.93	0.012	1.08	0.123	1.98	0.269
Adult obesity	(0.01)	0.031	(9.59)	0.004	3.60	0.041
Physical inactivity	(0.02)	0.040	(1.04)	5.290	1.76	0.010
Sexual transmitted infections	(1.16)	0.018	2.78	0.033	6.89	0.134
Teen birth	(4.28)	0.002	5.59	0.112	9.95	0.234
Adult smoking	(0.01)	0.044	(8.46)	5.343	(7.24)	0.003

Low R-squares reflect a weak relationship between the dependent and independent variables. The closer to 100%, the more variability of the dependent variance, PPRs, is being explained by the variability of the independent variables

(behavioral factors). Physical inactivity and adult smoking have the strongest relationships to HF PPR. Next, it is important to study the analysis of variance, ANOVA, for the test of the null hypothesis.

One Way Analysis of Variance (ANOVA): Health behaviors

For the ANOVA test, the dependent continuous element is the County Health Rankings' health behaviors and the independent nominal element is Prince George's County and all other counties. Table 14 shows the results of the ANOVA for health behaviors for hypothesis: RQ4: Does the County Health Rankings' health behaviors reported data on patient's inability to comply with directors affect PPRs? The F test was .066 and there was a probability (p value) of .799 (greater than α .05) or 799 times in 1000. When the null hypothesis is true, an F ratio at .066 or larger is expected. Therefore, the null hypothesis was not rejected. It is unlikely that the health behaviors means are different in Prince George's County as compared to other counties.

Table 14

ANOVA: Health Behaviors

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.005	1	.005	.066	.799
Within Groups	3.449	42	.082		
Total	3.455	43			

Research Subquestion 5: Health Factor Summary Variables Together

The last research subquestion asked if all County Health Rankings the summary variables together (County Health Rankings' data on ineffective patient education upon discharge, lack of outpatient drug prescriptions and providers, the lack of inadequate community support services, and the patient's inability to comply with directives) affect PPRs? The previous four subquestions were included in these variables. The following subcomponents include these factors:

HF Health Factors
XCa Access to Care
XCb Quality of Care
XF Health Factors
XS Social and Economic Factors

Scatter Plot for Access to Care RQ5

A scatter plot was developed for each CMS PPR and these subcomponents as well as the overall health behaviors. The scatter plots for RQ 5 are pictured in Appendix J. Table 15 lists the slope and R-square for each health factor (all variables).

Table 15

Slope and R-square for Each Summary Variable

	AMI		HF		PNEU	
	Slope	R2	Slope	R2	Slope	R2
Access to care	(1.66)	0.089	0.07	0.005	0.29	0.056
Quality of care	(0.31)	0.003	0.18	0.032	0.36	0.087
Health behaviors	(0.31)	0.049	4.55	3.426	0.04	0.015
Social and economic factors	(0.16)	0.038	0.02	0.015	0.05	0.084

Low R-squares reflect a weak relationship between the dependent and independent variables. The closer to 100%, the more variability of the dependent variance, PPRs, is explained by the variability of the independent variables (behavioral factors). Two factors in this table have strong relationships with all three PPRs: access to care for AMI and health behaviors for HF. Health behaviors have the strongest relationship to HF.

One Way Analysis of Variance (ANOVA): All variables together

For the ANOVA test, the dependent continuous element is the summary variables together in County Health Rankings the independent nominal element is Prince George's County and all other counties. Table 16 shows the results of the ANOVA for the summary variables together hypothesis: RQ 5: Do all of the variables together (County Health Rankings' data on ineffective patient education upon discharge, lack of outpatient drug prescriptions and providers, the lack of inadequate community support services, and the patient's inability to comply with directives) affect PPRs? The F test is .033 and there is a probability (p value) of .858 (greater than α .05) or 858 times in 1000. When the null hypothesis is true, F ratio at .033 or larger is expected. Therefore, the null hypothesis was not rejected. It is unlikely that the means of all the summary variables together are different in Prince George's County as compared to other counties.

Table 16

ANOVA: Health Factors (All Summary Variables Together)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.025	1	.025	.033	.858
Within Groups	32.763	42	.780		
Total	32.788	43			

Multiple Regression Analysis of Each Independent Variable

To this point, the scatter plots showed no curve or exponential patterns, few plots had outliers, most had strong relationships with positive or negative slopes. The next step was to take all the independent variables seen in County Health Rankings and see how well they predict the PPR of AMI, HF, and PNEU using multiple regressions. These formulas included all 25 variables used in research questions one through four, as well as variables in the physical environment (XPb and XPe groupings) and morbidity/quality of life (XOq groupings). The models and ANOVA charts are displayed in tables with their related coefficient charts are in Appendix K. The coefficient charts are used to select those dependent variables with a *p* value (sig.) of less than 0.05, thus reflecting a significant predictor.

AMI Multiple Regression Results

The model summary for AMI showed that solely the model accounted for 74.1% of the PPR. The adjusted R-square of 0.362 showed the loss of predictive power in this

model, which is high. The standard error of the estimate of 0.2817699 reflects the amount of predictive error within this regression analysis.

Table 17

Model Summary: AMI

Model	R	R-square	Adjusted R-square	Std. error of the estimate
1	.861[a]	.741	.362	.2817699

Note: [a]. Predictors: (Constant), XSv1 Violent crime rate, XPe2 Drinking water safety, XPb4 Commuting alone, XPb2 Limited access to healthy foods, XPe1 DailX fine particulate matter, XPb1 Access to recreational facilities, XCa3 Dentist Rate, XSu1 Unemployment, XSf2 Children in single parent households, XCb1 Preventable hospital stays rate, XCa2 Primary care physicians, XCb3 Mammography screening, XCa4 Could not see doctor, XSe1 High school graduation, XCb2 Diabetic screening, XHa1 Excessive drinking, XOq1 Low birth weight, XSu3 High housing costs, XHd2 Physical inactivity

Table 18 shows the results of the ANOVA. The F test is 1.955 and there is a probability (p value) of .110 (greater than α .05) or 110 times in 1000, when the null hypothesis is true. An F ratio at 1.955 or larger is expected. Therefore, the null hypothesis was not rejected. It is unlikely that the means of all factors are different in Prince George's County as compared to other counties; however, there maybe one or more independent factors that could still predict the AMI PPR.

Table 18

ANOVA: AMI

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.950	19	.155	1.955	.110[b]
	Residual	1.032	13	.079		
	Total	3.982	32			

Note: [b.] Predictors: (Constant), XSv1 Violent crime rate, XPe2 Drinking water safety, XPb4 Commuting alone, XPb2 Limited access to healthy foods, XPe1 DailX fine particulate matter, XPb1 Access to recreational facilities, XCa3 Dentist Rate, XSu1 Unemployment, XSf2 Children in single parent households, XCb1 Preventable hospital stays rate, XCa2 Primary care physicians, XCb3 Mammography screening, XCa4 Could not see doctor, XSe1 High school graduation, XCb2 Diabetic screening, XHa1 Excessive drinking, XOq1 Low birth weight, XSu3 High housing costs, XHd2 Physical inactivity

In reviewing the coefficient charts in Appendix K for AMI, the collinearity statistics showed that physical inactivity correlated too closely to other factors to show which predictor is predicting PPR reductions. Using the coefficient charts, it appears that the following independent county health factors can help to predict the AMI PPR: (a) XCa4 not able to see a doctor, (b) XPb1 access to recreational facilities, and (c) XPb2 limited access to healthy foods. The multiple regressions should be calculated with these three variables; however, a final test is to look at the *t* value, whose absolute value could be greater than the number 1. For these three independent county health factors, all the *t* values are greater than one resulting in the possibility of these independent county health rankings factor predicting AMI PPR.

The revised AMI model summary, the ANOVA, and the coefficients that all have a *p* value of greater than 0.05 and a *t* value greater than the number one, indicated no county health rankings factors predict AMI PPR, as shown in Appendix L. The ANOVA *p* value of .418 suggested that this model is not significant. The model summary R-square of 6.8% and Adjusted R-square of a negative 0.02% suggest that this model cannot be replicated without much predictive loss.

HF Multiple Regression Results

The model summary for HF shows that solely the model accounted for 59.7% of the PPR. The adjusted R-square of 0.008 shows the loss of predictive power in this model, which is high. The standard error of the estimate of 0.0697028 reflects the amount of predictive error within this regression analysis.

Table 19

Model Summary: HF

Model	R	R-square	Adjusted R-square	Std. Error of the Estimate
1	.773[a]	.597	.008	.0697028

Note: [a.] Predictors: (Constant), XSv1 Violent crime rate, XPe2 Drinking water safety, XPb4 Commuting alone, XPb2 Limited access to healthy foods, XPe1 DailX fine particulate matter, XPb1 Access to recreational facilities, XCa3 Dentist Rate, XSu1 Unemployment, XSf2 Children in single parent households, XCb1 Preventable hospital stays rate, XCa2 Primary care physicians, XCb3 Mammography screening, XCa4 Could not see doctor, XSe1 High school graduation, XCb2 Diabetic screening, XHa1 Excessive drinking, XOq1 Low birth weight, XSu3 High housing costs, XHd2 Physical inactivity

Table 20 shows the results of the ANOVA. The F test was 1.013 and there was a probability (p value) of .503 (greater than α .05) or 503 times in 1000. When the null hypothesis is true, the F ratio is expected to be at 1.013 or larger. Therefore, null hypothesis was not rejected. It is unlikely that the means of all factors are different in Prince George's County as compared to other counties; however, there maybe one or more independent factors that could still predict the HF PPR.

Table 20

ANOVA:HF

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.093	19	.005	1.013	.503[b]
	Residual	.063	13	.005		
	Total	.157	32			

Note: [b]. Predictors: (Constant), XSv1 Violent crime rate, XPe2 Drinking water safety, XPb4 Commuting alone, XPb2 Limited access to healthy foods, XPe1 DailX fine particulate matter, XPb1 Access to recreational facilities, XCa3 Dentist Rate, XSu1 Unemployment, XSf2 Children in single parent households, XCb1 Preventable hospital stays rate, XCa2 Primary care physicians, XCb3 Mammography screening, XCa4 Could not see doctor, XSe1 High school graduation, XCb2 Diabetic screening, XHa1 Excessive drinking, XOq1 Low birth weight, XSu3 High housing costs, XHd2 Physical inactivity

In reviewing the coefficient charts in Appendix K for HF, the collinearity statistics show that physical inactivity correlates too closely to other factors, making it impossible to see which predictor is predicting PPR reductions. Using the coefficient charts, it is apparent that the following independent county health factors can help to predict the AMI PPR: (a) XCa4 not able to see a doctor, and (b) XSe1 high school

education. The multiple regressions should be calculated with these two variables; however, a final test was to look at the *t* value, for which the absolute value is greater than the number one. For these two independent county health factors, all the *t* values are greater than one, resulting in the possibility of this independent variable predicting HF PPR.

The revised HF model summary, the ANOVA, and the coefficients that all have a *p* value of greater than 0.05 and a *t* value greater than the number one, except for high school education, which could predict HF PPR. The ANOVA *p* value of .062 suggested that this model is not significant. The model Summary R-square of 12.7% and Adjusted R-square of 8.4% suggest that this model cannot be replicated without much predictive loss.

PNEU Multiple Regression Results

The Model Summary for PNEU shows that solely our model accounted for 72.2% of the PPR. The adjusted R-square of 0.316 shows the loss of predictive power in this model, which is high. The standard error of the estimate of 0.0766818 reflects the amount of predictive error within this regression analysis.

Table 21

Model Summary: PNEU

Model	R	R-square	Adjusted R-square	Std. Error of the Estimate
1	.850[a]	.722	.316	.0766818

Note: [a.] Predictors: (Constant), XSv1 Violent crime rate, XPe2 Drinking water safety, XPb4 Commuting alone, XPb2 Limited access to healthy foods, XPe1 DailX fine particulate matter, XPb1 Access to recreational facilities, XCa3 Dentist Rate, XSu1 Unemployment, XSf2 Children in single parent households, XCb1 Preventable hospital stays rate, XCa2 Primary care physicians, XCb3 Mammography screening, XCa4 Could not see doctor, XSe1 High school graduation, XCb2 Diabetic screening, XHa1 Excessive drinking, XOq1 Low birth weight, XSu3 High housing costs, XHd2 Physical inactivity

Table 21 shows the results of the ANOVA. The F test was 1.779 with a probability (p value) of .146 (greater than α .05) or 146 times in 1000. When the null hypothesis is true, an F ratio at 1.779 or larger is expected; therefore, the null hypothesis was not rejected. It is unlikely that the means of all factors are different in Prince George's County as compared to other counties; however, there maybe one or more independent factors that could still predict the PNEU PPR.

Table 22

ANOVA: PNEU

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.199	19	.010	1.779	.146[b]
	Residual	.076	13	.006		
	Total	.275	32			

Note: [b] Predictors: (Constant), XSv1 Violent crime rate, XPe2 Drinking water safety, XPb4 Commuting alone, XPb2 Limited access to healthy foods, XPe1 DailX fine particulate matter, XPb1 Access to recreational facilities, XCa3 Dentist Rate, XSu1 Unemployment, XSf2 Children in single parent households, XCb1 Preventable hospital stays rate, XCa2 Primary care physicians, XCb3 Mammography screening, XCa4 Could not see doctor, XSe1 High school graduation, XCb2 Diabetic screening, XHa1 Excessive drinking, XOq1 Low birth weight, XSu3 High housing costs, XHd2 Physical inactivity

In reviewing the coefficient charts in Appendix K for PNEU, the collinearity statistics show that physical inactivity correlate too closely to other factors to show which predictor is predicting PPR reductions. Based on the coefficient charts, the following independent county health factors can help to predict the AMI PPR: (a) XCa3 dentist rate, (b) XCb2 diabetic screening, (c) XCb3 mammography screening, and (d) XOq1 low birth rate, (e) XSu1 unemployment, (f) XSu3 high housing costs, and (g) XSv1 violent crime rate. The multiple regressions should be calculated with these seven independent variables; however, a final test is to look at the *t* value, for which the absolute value is greater than the number one. For these four independent variables, all the *t* values are greater than one resulting in the possibility of these independent variables predicting PNEU PPR.

Appendix L shows the revised PNEU model summary, the ANOVA, and the coefficients that all have a *p* value of greater than 0.05 and a *t* value greater than the number one, except that diabetic screening, thus predicting PNEU PPR. The ANOVA *p* value of .009 suggests that this model is significant. The model summary R-square of 38.5% and adjusted R-square of 26% suggested that this model could be replicated without much predictive loss.

Summary of Findings

The study compared the AMI, HR and PNEU PPR results provided by CMS with the 26 behavioral factors provided by County Health Rankings. The problem presented was concerning how the community support services affected the levels of PPRs differently for Prince George's County than for other counties in Maryland. This comparison was made by utilizing secondary data gathered by CMS and County Health Rankings. A brief overall summary of the presented data precedes a more detailed explanation of the subquestions and the PPRs multiple regressions.

The scatter plots showed no curve or exponential patterns, few plots had outliers, all had at least one strong relationship with a positive or a negative slope. The results provided suggested that at least one independent variable in each subquestion has a relationship to HF, AMI, or PNEU. HF had five factors with high R-squares, AMI had one factor, and PNEU had two factors. Only the access to care subquestion rejected the null hypothesis related to lack of adequate dentists and a higher PNEU PPR, suggesting that the lack of dentists is a distinction among counties in Maryland and their means are

different. The next part of the study involved multiple regressions to predict PPRs using one or more of the County Health Rankings independent variables.

Multiple regressions for the three PPRs were calculated until only those independent variables with predictability remained. The intent was to find an independent variable that was able to predict each PPR. The study resulted in a 95% confidence level that the diabetic screening independent variable was a predictor for CMS's PNEU, one of the independent variables that also had a high R-square in the County Health Rankings for quality of care. A further detailed explanation of the results for each subquestion and the multiple regressions follows.

Scatterplots and ANOVA Results

The research subquestion 1 stated, Does the County Health Rankings' quality of care reported data on ineffective patient education upon discharge affect PPRs? The diabetic screening has the strongest relationship; however, the F tests suggested that the null hypothesis should not be rejected, thus stating that there are no statistical differences in Prince George's County from other Maryland counties in predicting PPRs.

Research Subquestion 2 stated, "Does the County Health Rankings' access to care reported data on the lack of outpatient drug prescriptions and providers affect PPRs?" The dentist rate variable has the strongest relationship with PNEU and a slight relationship with AMI, which means there is a likelihood that the means are different in Prince George's County and the other counties of Maryland. The statistical results suggested that the null hypothesis should be rejected, thus stating that there are statistical differences in Prince George's County from other Maryland counties in predicting PPRs.

The independent variable, dentist rate, offers a high F value and a *p* value of less than .05 for AMI and PNEU PPRs. The suggestion that more dentists would reduce AMI and PNEU PPRs leads one to understand that the lack of dental work leads to other health problems.

The research subquestion number three states, Does the County Health Rankings' social and economic factors reported data on the lack of inadequate community support services affect PPRs? The some college post secondary education variable has the strongest relationship with HF. This strong relationship of the lack of education, as compared to other counties in Maryland, suggested that there appears to be less adequate community services to support the opportunities to remain healthy at home. The F tests results suggested that the null hypothesis should not be rejected, thus stating that there are no statistical differences in Prince George's County from other Maryland counties in predicting PPRs.

The research subquestion number four stated, Does the County Health Rankings' health behaviors reported data on patient's inability to comply with directives affect PPRs? Physical inactivity and adult smoking are the two independent variables that have a strong relationship with HF. The F test results suggested that the null hypothesis should not be rejected, thus stating that there are no statistical differences in Prince George's County from other Maryland counties in predicting PPRs.

The research subquestion number five stated, Do all of the variables together (County Health Rankings' data on ineffective patient education upon discharge, lack of outpatient drug prescriptions and providers, the lack of inadequate community support

services, and the patient's inability to comply with directives) affect PPRs? The health behavior factor (XH grouping) has the strongest relationship with HF. The access to care factor (XCa grouping) has the strongest relationship with AMI. The F test results suggested that the null hypothesis should not be rejected, thus stating that there are no statistical differences in Prince George's County from other Maryland counties in predicting PPRs.

Multiple Regressions Results

Following the descriptive, R-squares, and ANOVA tests for each of the County Health Rankings factors, multiple regressions were performed for each PPR until what remained were one or more independent variables that could predict each CMS PPR. The multiple regressions were performed repetitively to eliminate those variables that do not predict PPRs. With each regression performed, those independent variables that had too tight of a correlation among themselves were eliminated, until what remained were predictive or nonpredictive independent variables. The *p* values and results for each PPR are as follows.

The AMI *p* value was greater than .05 (.418). The variable of could not see a doctor had an absolute *t* value of greater than one and its significance score was greater than .05. The collinearity statistics had a tolerance score over greater than .01 but VIF fewer than 10, which suggested that these variables correlate so closely to each other that it could not be determined which independent variable was doing the actual prediction.

The HF *p* value was slightly greater than .05 (.062). The variables of could not see a doctor and high school graduation have absolute *t* value of greater than one; however

only high school graduation had a significance score of less greater than .05. The collinearity statistics had a tolerance score greater than .01 but VIF fewer than 10, which suggested that these variables correlated so closely to each other that it was impossible to determine which independent variable is doing the actual prediction.

The PNEU *p* value was less than .05 (.009). The variable of diabetes screening had an absolute *t* value of greater than one and a significance score of slightly greater than .05. The collinearity statistics had a tolerance score greater than .01 but VIF less than 10; however, the VIF score is 6.231 and slightly less than 10. These statistical measurements suggested PNEU has a 95% confidence level and that the null hypothesis that all the means are equal could be rejected, or in other words, that some of the means in the counties may differ from the Prince George's County means.

The multiple regressions only resulted in three of the five sub research questions having any independent variable remaining in the final iteration of the regressive formulas. For research subquestion number one, we could reject the null hypothesis that quality of care reported with data of ineffective patient education upon discharge is not a predictor for PNEU PPR. The independent variable diabetic screening model summary has an R-square of .293 and an adjusted R-square of .220, which shows that the model has predictive power. The predictive value is for CMS's PNEU PPR.

For research subquestion number two, the null hypothesis, which stated access to care reported with data on lack of outpatient drug prescriptions and providers is not a predictor for any PPR, was not rejected. The only independent variable that had a high *t* value was could not see doctor, but its significant score was greater than .05. The model

summary has an R-square of .068 and very distant adjusted R-square of .002, which shows how much predictive power is lost.

For research subquestion number three, the null hypothesis, that social and economic factors reported with data on lack of inadequate community support services is not a predictor for any PPR, was not rejected. The independent variable, high school graduation model summary has an R-square of .127 and an adjusted R-square of .084. This statistic showed that the model has a low-level predictive power.

These are the overall results of the study. This research study showed a predictability and replication is possible. In Chapter 5, I will provide an overview of the findings of the study, identify the correlations, provide discussions on the findings including the implication for social change, recommended actions, and future research opportunities.

Chapter 5: Summary, Discussion, and Recommendation

Introduction

This study included an investigation of the similarities and differences of the types and levels of community support services affecting PPRs in the four highest readmitting hospitals in Prince George's County. The purpose of this quantitative research study was to determine if there was a relationship between CMS's PPRs and the types and levels of community support services in Prince George's County as compared to other counties in Maryland. The quantitative study used two secondary sources available on the CMS and County Health Rankings websites. This chapter will recommend changes at a hospital, county, and patient level that could affect the cost of healthcare and the health outcomes of patients as related to the CMS Triple Aim goals (Berwick et al., 2008). A review of the issue and findings follows.

Using 2006 through 2009 CMS patient claims data, CMS identified the top quartile of hospitals, nationwide, that had the highest PPRs in their states. In the state of Maryland, there were nine hospitals, of which four were in Prince George's County (CMS, 2011a). This county has five hospitals and four are on the CMS high readmit listing.

All counties in Maryland submit county behavioral data to the County Health Rankings database (Robert Wood Johnson Foundation & Institute, 2011). It became evident that a comparison of each county's behavioral data to the CMS PPR data might identify types and levels of community support services that could provide guidance for social change that could reduce PPRs. A quantitative study was performed using multiple

regressions to identify similarities and differences using the two secondary sources of CMS patient data and County Health Rankings behavioral data. The CMS data were the dependent variables and the County Health Rankings behavioral data were the independent variables.

Summary of Findings

Using the County Health Rankings behavioral factors, five sub research questions were developed to respond to the predictability of the dependent variables of CMS's PPRs: HF, AMI, and PNEU. The CMS data were downloaded from the CMS website, which offered the 2010 patient claims data. The County Health Rankings data were downloaded using the 2013 behavioral factors. To reduce potential researcher bias, industry peers were asked to confirm that the data were accurately downloaded by using instructions provided in Appendix D instructional manual.

Once the data were downloaded and validated, they were posted into SPSS and a variety of studies performed on each sub research question and each PPR. Statistical tests performed in this study included descriptive data, scatterplot charts, ANOVA F tests, and multiple regressions. A summary of each subquestion and results are as follows.

The first subquestion, Does the County Health Rankings' quality of care reported data on ineffective patient education upon discharge affect PPRs? showed a strong relationship to diabetic screening and PNEU, but failed to reject the null hypothesis due to its weak F test and significance. The first subquestion was the only question to show a 95% confidence level of predictability for PNEU using multiple regressions.

The second subquestion, Does the County Health Rankings' access to care reported data on the lack of outpatient drug prescriptions and providers affect PPRs? showed a strong relationship with the number of available dentist and PNEU. This subquestion was the only subquestion to reject the null hypothesis due to a low F test and zero significance. The multiple regressions showed too tight of a relationship among the independent variables when predicting HF or AMI, thus not allowing any one predictor to rise to the 95% confidence level.

The third sub question, "Does the County Health Rankings' social and economic factors reported data on the lack of inadequate community support services affect PPRs? showed a strong relationship with some college post secondary with HF, but failed to reject the null hypothesis due to its weak F test and significance. The multiple regressions showed too tight of a relationship among the independent variables when predicting HF, thus not allowing any one predictor to rise to the 95% confidence level, although high school graduation had a high value.

The fourth sub question, "Does the County Health Rankings' health behaviors reported data on patient's inability to comply with directives affect PPRs?" showed a strong relationship with physical inactivity and adult smoking with HF. This question failed to reject the null hypothesis due to its weak F test and significance. The multiple regressions showed no relationships among independent variables and any of the PPRs, HF, AMI, or PNEU.

The fifth sub question, "Do all of the variables together (County Health Rankings' data on ineffective patient education upon discharge, lack of outpatient a drug

prescriptions and providers, the lack of inadequate community support services, and the patient's inability to comply with directives) affect PPRs?" showed two strong relationships. One strong relationship was with health behaviors for HF and the other strong relationship was for access to care for AMI. This question failed to reject the null hypothesis due to its weak F test and significance. The multiple regressions showed no relationships among independent variables and any of the PPRs, HF, AMI, or PNEU.

Of the five subquestions with the three sets of multiple regressions, the only PPR predictor was within the first sub question, "Does the County Health Rankings' quality of care reported data on ineffective patient education upon discharge affect PPRs?" The County Health Rankings independent variable of diabetic screening shows a predictive value for the CMS PNEU. The ineffective patient education can predict higher PPRs in Prince George's County because of the lack of diabetic screening (independent variable) within County Health Rankings. A comparison of the peer-reviewed writings on this subject is discussed in the interpretations of findings section of this study, which further compares this study to others in the field.

Interpretations of Findings

This study was an attempt to research the predictability of PPRs with the county's health behaviors as compared to the other counties in Maryland. The results will add to the body of knowledge that Prince George's County has a lack of diabetic screening that could lead to more PPRs, as compared to other counties in Maryland. In this section, I will attempt to analyze and interpret this study's findings based on the scholarly literature previously presented on the Triple Aim approach to health care delivery (Berwick et al.,

2008) and in the context of the field model of health and well-being theory (Evans & Stoddart, 1994). This study confirms and extends upon the scholarly literature written about Prince George's County health care delivery system (Lurie et al., 2009).

Triple Aim Relationship

The Triple Aim, as presented by Berwick et al., included "improving the experience of care, improving the health of populations, and reducing the per capita cost of health care" (2008, p. 759). Overall, this study's results will add to and not contradict Berwick et al.'s Triple Aim. Berwick et al. (2008) claimed that the providers of care are working within a broken system, a system, not unified, when serving patients' needs.

Improving the experience of care. Improving the access to care and the quality of care is the formula for improved outcomes (Berwick et al., 2008). In this component of the Triple Aim, Berwick et al. continues to document that access to physicians, equipment, and medications is necessary for the individual's health care experience to have a successful outcome. RQ1: Does the County Health Rankings' quality of care reported data on ineffective patient education upon discharge affect PPRs? The lack of diabetic screening is one of the independent variables in RQ1 that resulted as a predictor to increased PNEU PPRs in Prince George's County, as compared to other counties in Maryland.

This study revealed that ineffective patient education on diabetic screening is a predictor of PPRs in Prince George's County. Each individual's experience of care leads to differing results or health outcomes (Berwick et al., 2008). When there is inequity in society in the offering of services, such as the lack of diabetic screening in Prince

George's County as compared to other counties in Maryland, then policies need to be revised to ensure obstacles are reduced or eliminated and the individual experience of care is equitable.

The removal of the obstacle that leads to the lack of diabetic screening in Prince George's County should include education that encourages the willingness of the patient to seek care and understand the benefits. Collaboration between county departments and the providers of care could begin to remove this obstacle. Although not a direct predictor to PPRs, RQ3 showed a lack of some college post secondary education as an obstacle to patients understanding their health care options. Reuben and Tinetti (2012) suggested that a goal-oriented patient care focus is most appropriate for patients with comorbidities, and diabetic screening often identifies with other health issues (Lurie et al., 2009) that could lead toward an improved individual outcome, more than could be documented from this study.

Improving population health. Improving population outcomes would require that all subpopulations receive the same quality of care and improved outcomes. RQ1 identified that the quality of care's results through the lack of diabetic screening in Prince George's County showed that the outcomes, higher PNEU PPRs, are worse in this county than the rest of Maryland for the CMS population. There are different subpopulations in Prince George's County, namely high Medicaid and uninsured patients (Lurie et al., 2009), which suggest that the providers and payers have conflicting self-interests against population health equities (Berwick et al., 2008). The opportunity for Maryland to prepare policies that link payment for services to providers and from payers to the

residents in Prince George's County is a first step in linking the first two components of the Triple Aim, the access and the outcomes.

Reducing the per capita costs. Adding dollars to the health care system will improve access and possibly outcomes, but not the third component of the Triple Aim (Berwick et al., 2008). This study's model of multiple regressions predicated the reduction of PNEU PPRs through improved diabetic screening. The transition from hospitals to home is the intent of Berwick et al. and this study showed that with this transition and increased diabetic screening, Prince George's County could lead toward the reduction of PPRs, meeting the Triple Aim in total.

Berwick et al. (2008) suggested that innovative ideas are needed, but the reduction of PNEU PPRs in Prince George's County through increased diabetic screening can occur in schools, grocery stores, health fairs, and other public locations with a minimal cost per capita. Coleman et al. (2004) suggested that a variety of interventions has the opportunity to improve the use of services and improve health outcomes. Moving patients from screening to implementation of health changes within their lives is yet another obstacle to be documented and resolved once an improved tracking process is developed and in place (2008). The Evans and Stoddart field model of health and well-being (1994) is the theory that fits Triple Aim (Berwick et al., 2008) and supports the results of this study.

Field Model of Health and Well-being Theory

The guiding theory of collaborative activities among players that improves the health care delivery continuum of care can be found in the field model of health and well-

being (Evans & Stoddart, 1994). The theoretical model, as seen in Appendix C, shows the determinants of health with broad components to include providers of care, policymakers, and ordinary people. In this study, the reduction of PNEU PPRs in Prince George's County can be predicted with the increase of diabetic screening, which encompasses providers of care, policymakers, and ordinary people.

The field model is an analytic tool with interplay among community factors and individuals and their caregivers. This study's RQ1 discussed the opportunity to improve the quality of care through patient education. The lack of diabetic screening is an educational component and can be supported by the field model in many of its components. The lack of diabetic screening can be a result of (a) poor education (social environment), (b) poor transportation to providers (physician environment), (c) poor outcomes due to lack of visits (health care and diseases), (d) lack of understanding on how diabetes could affect future life choices (health and function, individual), (e) lack of fiscal ability to pay for the right food and drugs (prosperity and quality of life), and (f) the lack of understanding family diabetic history (genetic).

The field model of health and well-being (Evans & Stoddart, 1994) supports the results of this study because the lack of diabetic screening can be discussed in each of the model's components in the delivery of health care. As with the field model, my study showed that each component has a relationship to health status, yet not necessarily a relationship among themselves (Weissman, 1996). The field model identified players and aligned with my study—the players each have a job to do to improve the overall health and well-being of the individual and society.

Confirm and Extend upon the Literature on Prince George's County Environment

The Prince George's County Commissioners contracted with RAND to prepare a report on the county's health delivery process (Lurie et al., 2009). The report documented that primary care physicians were lacking in the county, as compared to other counties in Maryland. This research study resulted in adding to the body of knowledge that Prince George's County has a lack of diabetic screening that could lead to more PPRs for PNEU, as compared to other counties in Maryland. Diagnosed diabetes has many co-morbidities ("Transforming health in Prince George's County, Maryland: A public health impact study," 2012) and as Reuben and Tinetti (2012) pointed out, the Triple Aim (Berwick et al., 2008) approach to health care outcomes improvement many not assist with all comorbidity illnesses. So where does Prince George's County Commissioners go from here?

This research study indicated that diabetic screening fits some of the components of the Triple Aim and is in context with the field of model of health and well-being. The link between these two scholarly works could be the offering of diabetic screening services to the residents of Prince George's County with policymakers' efforts to inform the citizens of the diabetic screening opportunities and special grant programs to reimburse providers of services. With a customized patient-centered service delivery system (Reuben & Tinetti, 2012), there is a chance to reduce PNEU PPRs when more patients receive diabetic screening.

Limitations of the Study

The first assumption was the timeliness of the data used in the study. Fortunately, CMS had just updated its claims data in March 2013, so the latest data were available for this study. County Health Rankings data are frequently updated. The second limitation in this study was how I would interpret the relationships between and among the variables in the community services. There were 27 classifications of data to evaluate in County Health Rankings. The use of scatter plots and multiple regressions assisted in identifying relationships.

Recommendations for Action

This research study showed that many of the independent variables within the County Health Rankings are interdependent and cannot be identified as a predictor for PPRs; however, one independent variable, diabetic screening, was a predictor. The goal of this research study was to identify more preventable readmissions and improve quality of life for the 65 and older patients living in Prince George's County, a subpopulation in Maryland. This subpopulation has a greater percentage of discharges returning to hospitals than any other county in Maryland (CMS, 2011a). With all the players seen in the field model of health and well-being (Evans & Stoddart, 1994) and the Triple Aim (Berwick et al., 2008) approach, then PNEU PPR reduction has an opportunity to be successful in Prince George's County when diabetic screening is increased. With diabetics having comorbidities ("Transforming health in Prince George's County, Maryland: A public health impact study," 2012), the increase in diabetic screening can

also offer a healthier community at large when patients are able to self-manage their care needs at home.

Involving the community, the policymakers, the providers of care, and the payers for services in a collaborative effort to increase diabetic screening beginning in the schools and other public locations can be the first step in reducing PPRs. This study does suggest some barriers such as many of the County Health Rankings independent variables are co-dependent on each other and not easily seen as a predictor to PPRs. RQ4 identified physical inactivity as a determinate to HF; however, not as a predictor to HF. Access to care and health behaviors were determinate to PPR, but again not a predictor to any PPR.

This study has raised possibilities for further questions and discussions that could add to the body of knowledge. First, non-Medicare patient claims data were not used since there was not one source of for this secondary data. With assistance from major insurance carriers, a similar study might be able to be completed. Second, cost barriers to offering diabetic screening within Prince George's County should be reviewed before a program is put in place. Third, a tracking system of services provided and their outcomes with patient satisfaction should be developed. Fourth, a further study on the comorbidities related to diabetic screening may show that the cost benefit is greater than the reduction of PPRs. Finally, there are other PPRs in each county that can be studied to find best practices to reduce PPRs.

The first recommendation for further study surrounds the population studies, CMS Medicare patients in 2010. The secondary data provided by County Health Rankings (Robert Wood Johnson Foundation & Institute, 2011) identified PPRs as a

determinant for HF but not the other two CMS PPRs of AMI and PNEU. This is because the County Health Rankings looked at all readmissions for all diagnoses and all payers as reported by the counties. The differences in the Maryland counties could show quite different independent variables and predictability when all payer data are used. The Triple Aim (Berwick et al., 2008) is a CMS focused approach, but services provided in a community are for all populations, so understanding all populations is needed to ultimately offer equitable community health.

As in all jurisdictions, there are scarce resources to satisfy all community needs, with population health just one of many. The second recommendation for further study is how to pay for population health through individual taxes or payments, insurance carrier support, providers of services community benefits and other reallocation of federal, state or local funds.

The third recommendation for further study is the development of a tracking system that can identify when population health is improving and equitable among all populations. The current system has committed providers practicing in a broken system (Meyer, 2011). CMS current non-collaborative payment methodologies for each provider does not offer a system that is beneficial for population health (2011). As long as there is little sharing of clinical data between patients, the providers, and payers, a tracking system that has efficiencies cannot be developed.

The fourth recommendation for further study is to expand upon the lack of diabetic screening as a PPR predictor for other diagnoses. Diabetes leads to many other physical ailments, and comorbidities are critical in improving the delivery of health care

and the improvement of the population health (Reuben & Tinetti, 2012). Quality outcomes for a diagnosed diabetic patient following a diabetic screening may find other reductions in PPRs related to early detection (Metzler et al., 2012). The reduction of the use of emergency rooms (Lurie et al., 2009) could also be an outgrowth of this further study.

The last recommendation for further study is the review of other PPRs in each county to find best practices that fit the Maryland citizens. HSCRC (HSCRC, 2011d) gathers claims data from each hospital and can begin to look at each PPR and locate best practices. Groups can review the data for validity and discussions can begin towards improved population health. An expansion of this research study utilizing the HSCRC claims data can begin to identify for the policymakers other PPRs that need improvements based on a county-per-county comparison.

In summary, recommendations include studying other payers, creating cost constraints for new preventive programs, developing a tracking system on outcomes, identifying comorbidities benefits with diabetic screening, and identifying best practices that reduce other PPRs per county. These further recommendations do not exceed the boundaries of this study, are grounded in the scholarly literature presented, and are within the strengths of this study. This research study as well as further recommended actions suggest that collaboration is required as seen in the field model of health and well-being (Evans & Stoddart, 1994) for changes to occur in society.

Implication for Social Change

This study focused on answering why four of the five hospitals of Prince George's County were in the fourth quartile of the highest PPRs in Maryland. What were the different community services offered in other counties that helped citizens remain healthy at home and Prince George's County citizens need to be readmitted? The study utilized CMS patient claims data from 2010 and the County Health Rankings data from 2013 to identify any correlations between PPRs and County Health Rankings variables. Future research can be performed using this model with current data elements in Maryland or even other states.

Potential for positive social change lies in the reduction of PPRs in Prince George's County by implementing diabetic screening programs in schools and other public areas. Individual and community health will improve when more residents of Prince George's County know their diabetic risks and react accordingly. Until then, this study points to continued high PNEU PPRs.

The findings of this study identified a predictor between a PPR and an independent County Health Rankings variable. With the use of the Evan and Stoddart field model on health and well-being, policymakers can begin to develop tracking systems to monitor public health outcomes based on the use of scarce resources. This research study identified a predictor of diabetic screening with PNEU PPRs. A primary care visit including diabetic screening can result in identification of comorbidities in which policymakers can model regulations that support population health outcomes.

Another possibility for positive social change could be facilitated if the next sets of researchers use this model in comparing the County Health Ranking data with their specific PPRs or other diagnoses in their communities. The continuation of identifying factors that prevent the improvement of health outcomes and increase the cost of delivery will help in identifying how to better utilize scarce resources. A positive impact will also increase the overall population health. The Triple Aim (Berwick et al., 2008) of individual positive experience, community health, and reduced cost per capita will continue to be developed using this model of multiple regressions between the County Health Rankings data and the PPRs or other diagnoses.

Conclusion

CMS reimburses hospitals for admissions and anticipates that upon discharge, patients can find community support services to be able to remain healthy at home (Raybum, 1992). Studies on high-risk Medicare patients have shown that readmissions occur when the transition from hospital to home fails due to the lacking community support services (Coleman, 2004). Berwick et al. (2008) identified a Triple Aim approach to health care that includes the improvement of patient experience, the improvement of population health, and the reduction of cost per capita. Evan and Stoddart (1994) developed the field model of health and well-being, as seen in Appendix C, that was used as the theoretical basis for this study of why are there so many readmissions in Prince George's County as compared to other Maryland counties as reported by CMS.

This study's problem statement is that there is a problem in Prince George's County, Maryland, that high-risk Medicare beneficiaries are being readmitted to hospitals

at a higher rate than the state's average (CMS, 2011d). The need existed to see if the community services offered in the counties differed, and if so, which services could be a predictor for high PPRs. The study was performed using publicly available data.

Using the secondary data sources from CMS for patient claims data and the community services data from County Health Rankings, descriptive, scatter plots, and multiple regressions statistical measurements were performed that identified one independent variable as a predictor of readmissions. The resulting independent variable was the lack of diabetic screening in Prince George's County predicting PNEU PPRs. Many other independent variables ranked high in the multiple regressions but none appeared to be an independent predictor or a health services determinant.

Metzler et al. (2012) identified that more preventable care results in fewer preventable readmissions. In Prince George County, the lack of adequate primary care physicians represents an example of the health services determinant (Lurie et al., 2009). As seen in this research study, the lack of diabetic screening during a primary care visit is also an example of the health services determinant. Lurie et al. identified the overuse of emergency rooms when primary care physicians are lacking. Conclusions for this study indicate that with the increase of diabetic screening fewer PNEU PPRs are probable, thus aligning with Lurie et al. that documented that a lack of primary care physicians increased the use of emergency rooms in Prince George's County.

This research study has added this new variable to the body of knowledge for Prince George's County and its policymakers. If policymakers can make regulations to increase diabetic screenings, then the results would benefit the individual patient and

overall population by improving health and reducing the cost per capita. As documented by many scholars, the improvement of patient outcomes through preventive care, such as diabetic screening, will have a positive social impact.

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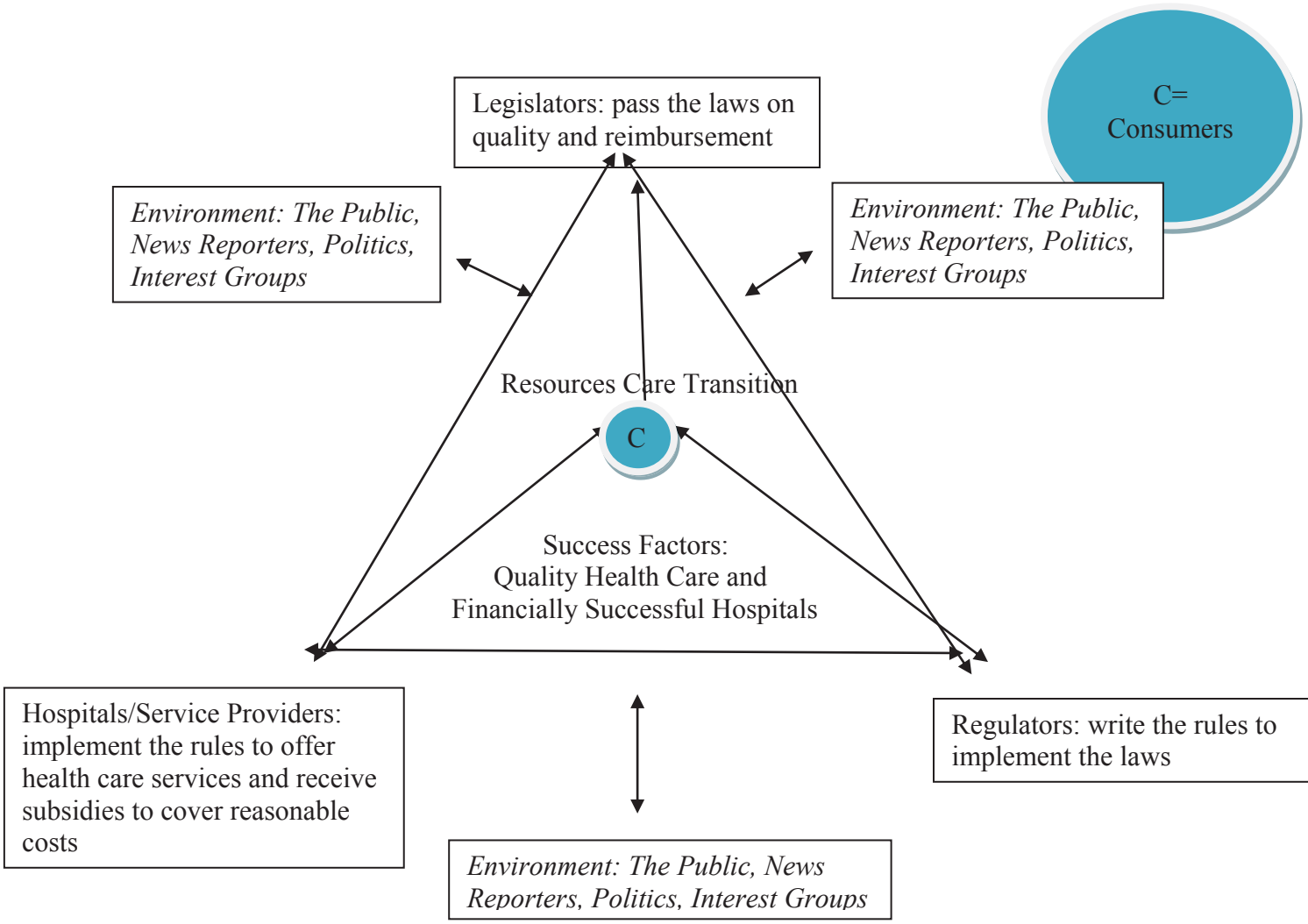
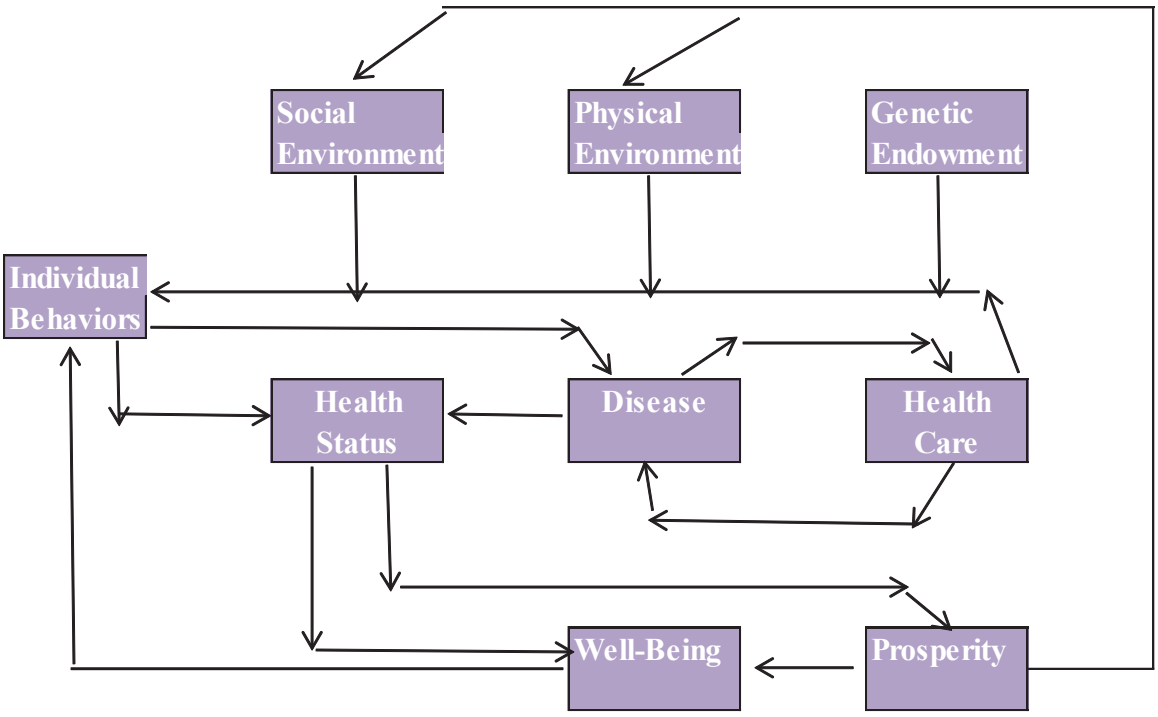
Appendix A: Theoretical Framework: Care Continuum Delivery Model



Appendix B: PDF from CMS Website on Fourth Quartile of PPRs

Hospital Name	County Name	30-Day AMI	30-Day HF	30-day PNEU
University of Maryland Medical Center	Baltimore City	22.3	27.4	21
Prince Georges Hospital Center	Prince George	22	28.5	
Franklin Square Hospital Center	Baltimore	21.8	28.3	
Montgomery General Hospital, Inc.	Montgomery	21.1	30.2	
Johns Hopkins Bayview Medical Center	Baltimore City	23		22.5
Civista Medical Center	Charles		28.8	21.4
Doctors' Community Hospital	Prince George	20.7	28.6	
Southern Maryland Hospital Center	Prince George	22.2		22.8
Fort Washington Hospital	Prince George		27.8	20.2

Appendix C: Evans and Stoddart Field Model of Health and Well-Being



Note: From "Why Are Some People Healthy And Others Not?" by R. G. Evans, M. L. Barer, and T. R. Marmor, 1994, p. 53, New York, Adline De Gruyter. Adapted with permission of the authors.

Appendix D: Instructional Manual

March 31, 2013

Dear Friends in Healthcare,

This week the Institutional Research Board (IRB) and my Dissertation Committee Chair gave me permission to begin my dissertation study. In order to ensure reliability, I am asking peers in healthcare to perform a check for accuracy of the selection of the data in my study. You have shown interest in my study, and I hope you will be willing to assist me in checking my data for accuracy.

In this letter, I have prepared the necessary steps to pull the data from the two secondary websites, CMS and County Health Rankings. I have included the website links necessary to capture data used in my study. I have included two files on the data that I pulled and assembled.

Once you pull the data from the websites, I am asking that you confirm that my data and your data match. The entire project should take around 35 minutes, depending on the speed of your internet. You will send me an email (a) to confirm your agreement with my data and crosswalks or (b) to identify our differences. Please send the email to me by April 5, 2013.

Thank you so much for offering your time and attention; however, for any reason, you are unable to participate, please also let me know this by April 5, 2013 by email or phone.

Camille R. Bash
Camille.bash@waldenu.edu
240-460-6393 cell

Attachments: County Health Rankings Download File
Medicare Download with Provider #s, Hospital Names, and County Names File

Contents

Centers for Medicare and Medicaid Services (CMS): (Time to complete 3 minutes)

Step 1: Find the Data File

https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/index.html

Select Readmissions Reductions Program

https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Readmissions-Reduction-Program.html

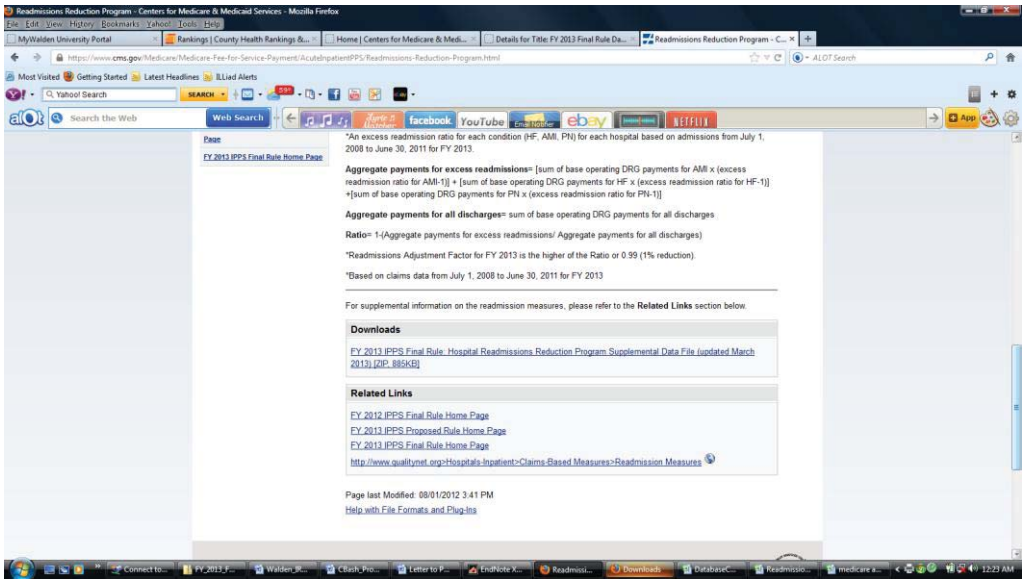
Screen Shot A

Step 2: Open the Data File

Go to bottom of screen and select Download –

https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Downloads/FY_2013_FR_Readmissions_File.zip

Screen Shot A



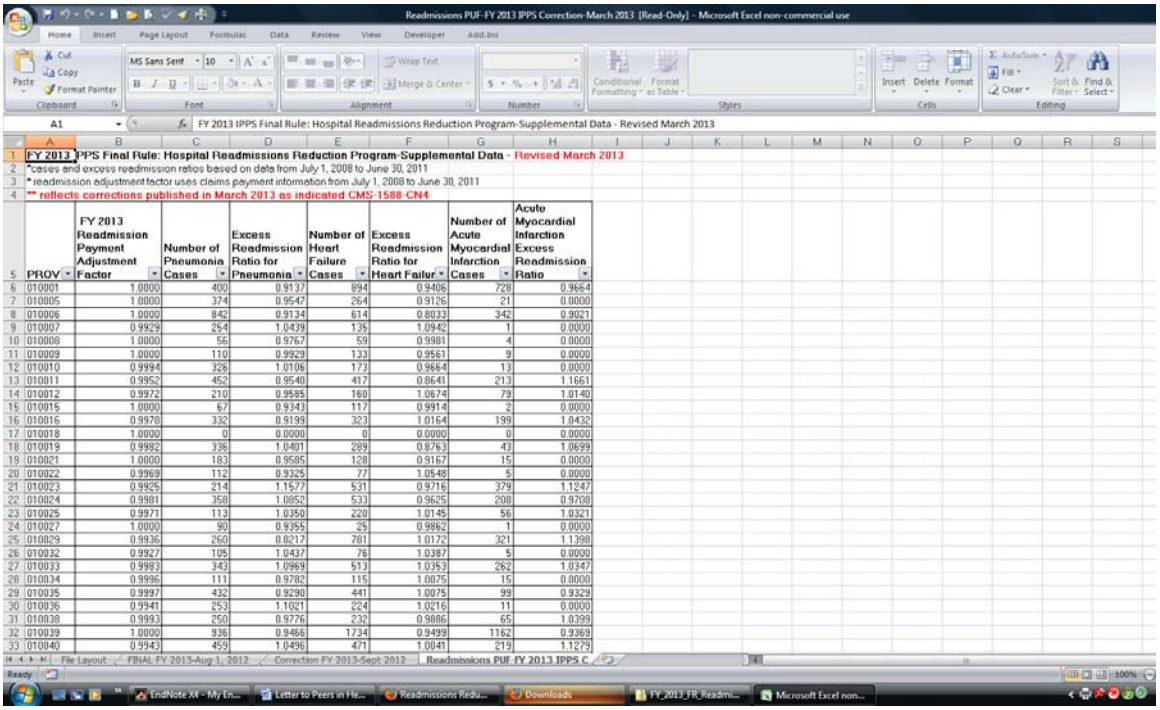
(some files show this screen – click to open Excel File)

Step 3: Review the Data File

Go to the Maryland Provider Numbers: 210001 to 210061 and validate columns of data with my Excel Sheet.

SAVE THIS FILE: MEDICARE DATA

Screen Shot A



Readmissions PUF-FY 2013 IPPS Correction-March 2013 [Read-Only] - Microsoft Excel non-commercial use

FY 2013 IPPS Final Rule: Hospital Readmissions Reduction Program-Supplemental Data - Revised March 2013

*cases and excess readmission ratios based on data from July 1, 2008 to June 30, 2011

* readmission adjustment factor uses claims payment information from July 1, 2008 to June 30, 2011

** reflects corrections published in March 2013 as indicated CMS-1588-CN4

PROV	FY 2013 Readmission Payment Adjustment Factor	Number of Pneumonia Cases	Excess Readmission Ratio for Pneumonia	Number of Heart Failure Cases	Excess Readmission Ratio for Heart Failur	Number of Acute Myocardial Infarction Cases	Acute Myocardial Infarction Excess Readmission Ratio
010001	1.0000	400	0.9137	894	0.9406	728	0.9664
010005	1.0000	374	0.9547	264	0.9126	21	0.0000
010006	1.0000	842	0.9134	614	0.8033	342	0.9021
010007	0.9929	254	1.0439	135	1.0942	1	0.0000
010008	1.0000	56	0.9767	59	0.9981	4	0.0000
010009	1.0000	110	0.9929	133	0.9561	9	0.0000
010010	0.9994	326	1.0106	173	0.9664	13	0.0000
010011	0.9952	452	0.9540	417	0.8641	213	1.1661
010012	0.9972	210	0.9585	160	1.0674	79	1.0140
010015	1.0000	67	0.9343	117	0.9914	2	0.0000
010016	0.9978	332	0.9199	323	1.0164	199	1.0432
010018	1.0000	0	0.0000	0	0.0000	0	0.0000
010019	0.9982	336	1.0401	289	0.8763	43	1.0699
010021	1.0000	183	0.9585	128	0.9167	15	0.0000
010022	0.9969	112	0.9325	77	1.0548	5	0.0000
010023	0.9925	214	1.1677	531	0.9716	379	1.1247
010024	0.9981	358	1.0852	533	0.9625	208	0.9708
010025	0.9971	113	1.0350	220	1.0145	56	1.0321
010027	1.0000	90	0.9255	25	0.9862	1	0.0000
010029	0.9936	260	0.8217	781	1.0172	321	1.1398
010032	0.9927	105	1.0437	76	1.0387	5	0.0000
010033	0.9983	343	1.0969	513	1.0353	262	1.0347
010034	0.9996	111	0.9782	115	1.0075	15	0.0000
010035	0.9997	432	0.9290	441	1.0075	99	0.9329
010036	0.9941	253	1.1021	224	1.0216	11	0.0000
010038	0.9993	250	0.9776	232	0.9886	65	1.0399
010039	1.0000	936	0.9466	1734	0.9499	1162	0.9369
010040	0.9943	459	1.0496	471	1.0041	219	1.1279

County Health Rankings: (Time to complete 2 minutes)

Step 4: Open the URL and select Maryland

http://www.countyhealthrankings.org/

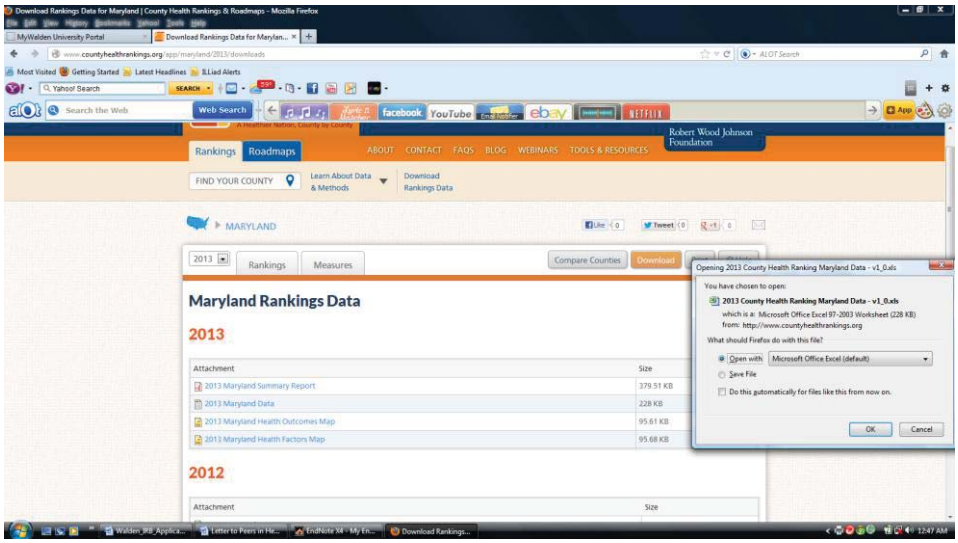
Screen Shot A

Step 5: Press Downloads and Open Excel

Select 2013 Maryland Data download.

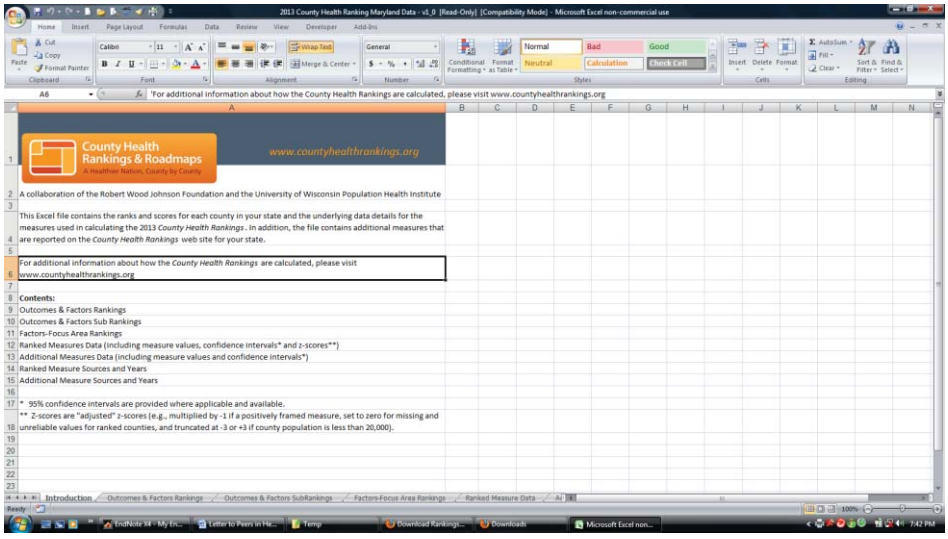
SAVE FILE: COUNTY DATA

Screen Shot A



Validate at least the second tab with my County Health Rankings Report

Screen Shot B



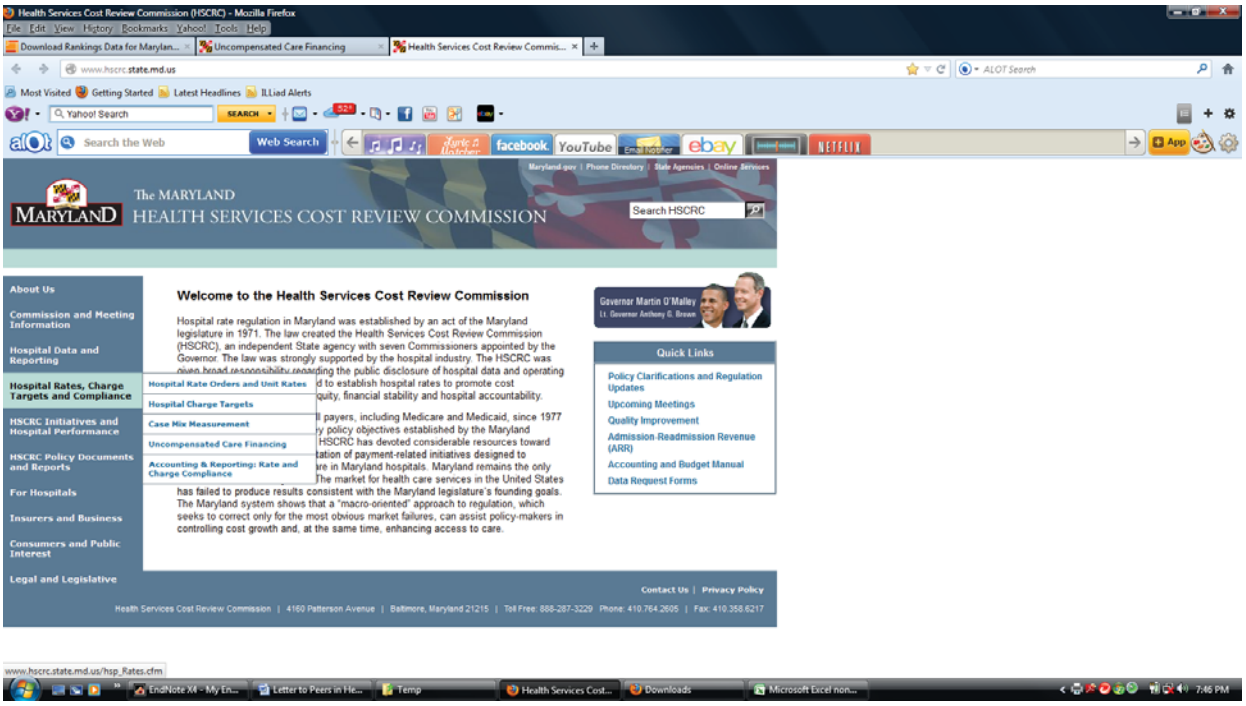
Cross-Walk Provider #s to Hospital and Counties: (Time to complete 30 minutes)

Step 6: Crosswalk between Number and Hospital (Time to complete 2 minutes)

Open http://www.hscrc.state.md.us/

Select “Hospital Rates, Charge Target, and Compliance “

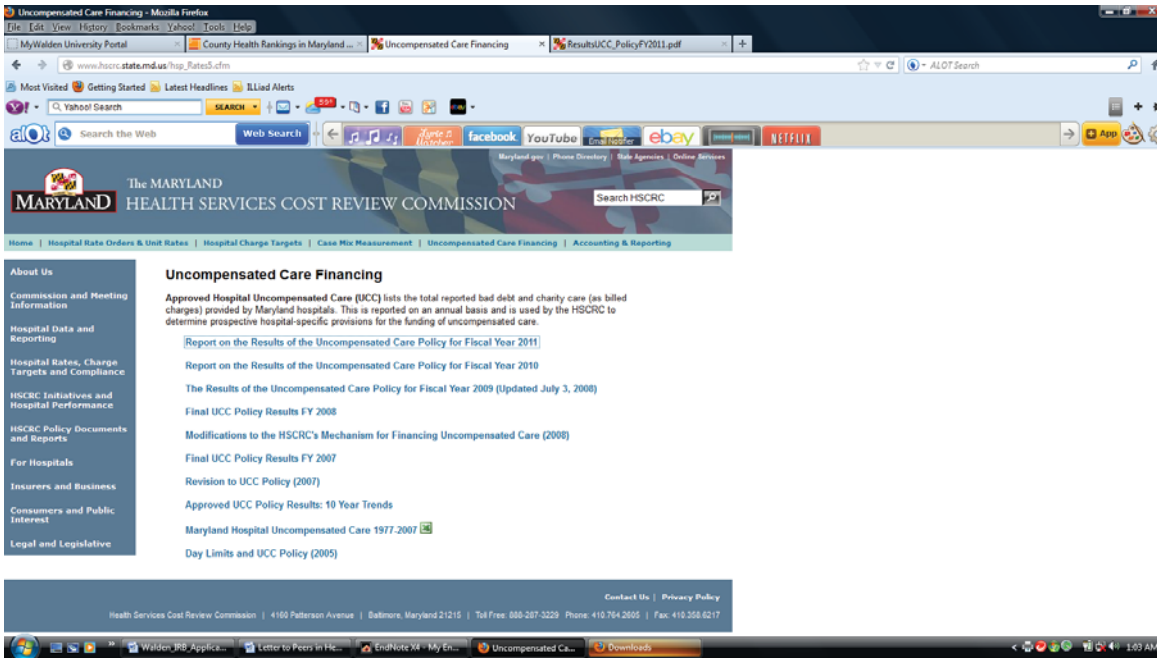
Screen Shot A



Open the first Uncompensated Report, got to Page 5 for crosswalk between hospital name and Medicare provider #.

PRINT PAGE 5.

Screen Shot A



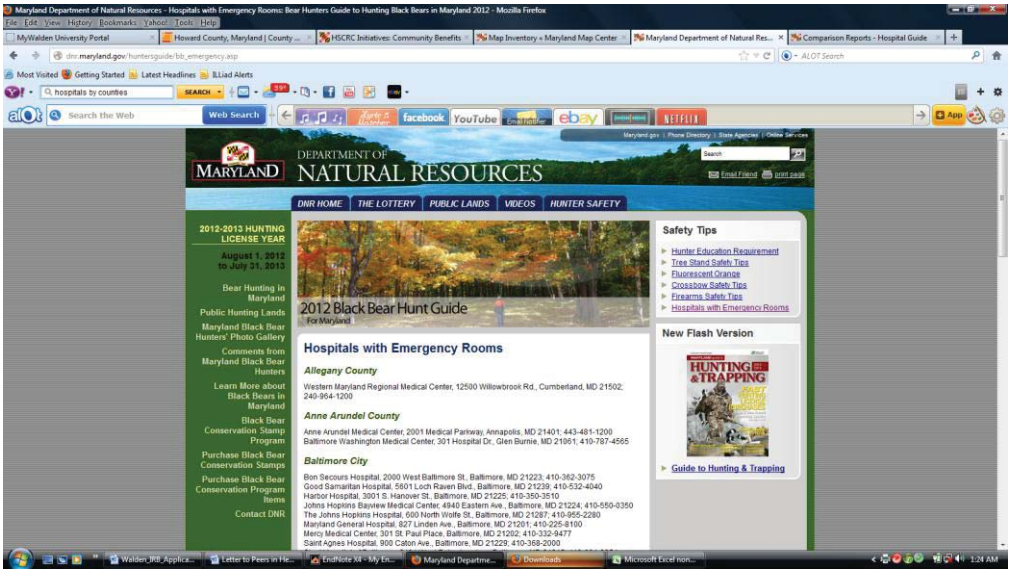
Step 7: Crosswalk between Hospital and County (Time to complete 3 minutes)

Open URL: http://dnr.maryland.gov/huntersguide/bb_emergency.asp

To find listing of hospitals by county in Maryland.

PRINT PAGES

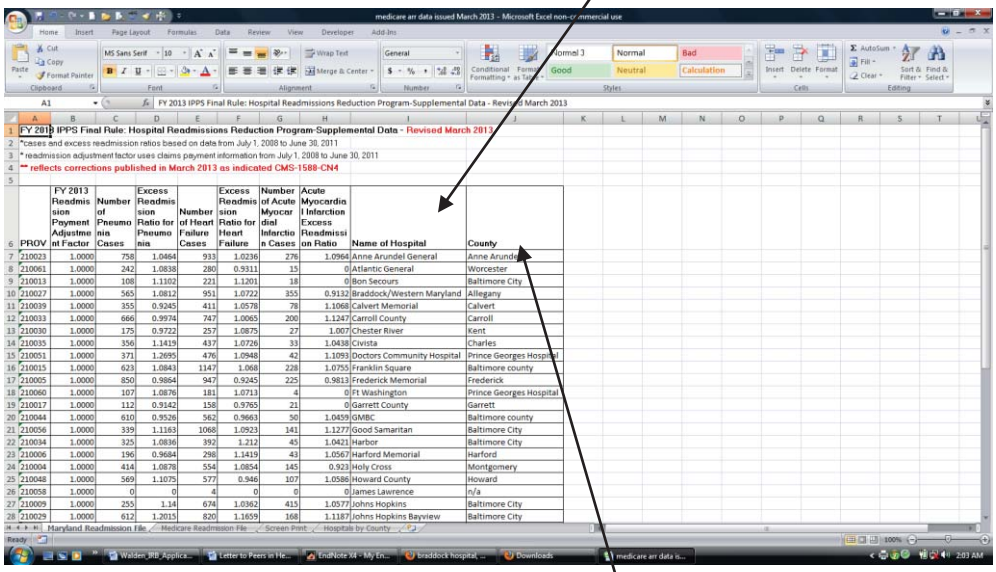
Screen Shot A



Step 8: Proof to My Medicare Excel Sheet (Time to complete 25 minutes)

Open my Medicare Excel Sheet and validate Name of Hospital from Page 5 of the Uncompensated Care Report.

Screen Shot A



FY 2013 IPPS Final Rule: Hospital Readmissions Reduction Program-Supplemental Data - Revised March 2013

*cases and excess readmission ratios based on data from July 1, 2008 to June 30, 2011

* readmission adjustment factor uses claims payment information from July 1, 2008 to June 30, 2011

** reflects corrections published in March 2013 as indicated CMS-1588-CN4

PROV	FY 2013 Readmission Payment Adjustment Factor	Number of Pneumonia Cases	Excess Readmission Ratio for Pneumonia	Number of Heart Failure Cases	Excess Readmission Ratio for Heart Failure	Number of Acute Myocardial Infarction Cases	Acute Myocardial Infarction Excess Readmission Ratio	Name of Hospital	County
210023	1.0000	758	1.0464	933	1.0236	276	1.0964	Anne Arundel General	Anne Arundel
210061	1.0000	242	1.0838	280	0.9311	15	0	Atlantic General	Worcester
210013	1.0000	108	1.1102	221	1.1201	18	0	Bon Secours	Baltimore City
210027	1.0000	565	1.0812	951	1.0722	355	0.9132	Braddock/Western Maryland	Allegany
210039	1.0000	355	0.9245	411	1.0578	78	1.1068	Calvert Memorial	Calvert
210033	1.0000	666	0.9974	747	1.0065	200	1.1247	Carroll County	Carroll
210030	1.0000	175	0.9722	257	1.0875	27	1.007	Chester River	Kent
210035	1.0000	356	1.1419	437	1.0726	33	1.0438	Civista	Charles
210051	1.0000	371	1.2695	476	1.0948	42	1.1093	Doctors Community Hospital	Prince Georges Hospital
210015	1.0000	623	1.0843	1147	1.068	228	1.0755	Franklin Square	Baltimore county
210005	1.0000	850	0.9864	947	0.9245	225	0.9813	Frederick Memorial	Frederick
210060	1.0000	107	1.0876	181	1.0713	4	0	Ft Washington	Prince Georges Hospital
210017	1.0000	112	0.9142	158	0.9765	21	0	Garrett County	Garrett
210044	1.0000	610	0.9526	562	0.9663	50	1.0459	GMBC	Baltimore county
210056	1.0000	339	1.1163	1068	1.0923	141	1.1277	Good Samaritan	Baltimore City
210034	1.0000	325	1.0836	392	1.212	45	1.0421	Harbor	Baltimore City
210006	1.0000	196	0.9684	298	1.1419	43	1.0567	Harford Memorial	Harford
210004	1.0000	414	1.0878	554	1.0854	145	0.923	Holy Cross	Montgomery
210048	1.0000	569	1.1075	577	0.946	107	1.0586	Howard County	Howard
210058	1.0000	0	0	4	0	0	0	James Lawrence	n/a
210009	1.0000	255	1.14	674	1.0362	415	1.0577	Johns Hopkins	Baltimore City
210029	1.0000	612	1.2015	820	1.1659	168	1.1187	Johns Hopkins Bayview	Baltimore City

After you check that the Hospital Name is linked to the right Provider number, then sort by Hospital Name and proof that the right County is linked to the right Hospital Name.

When you have finished – please email your findings to me by Friday, April 5, 2013.

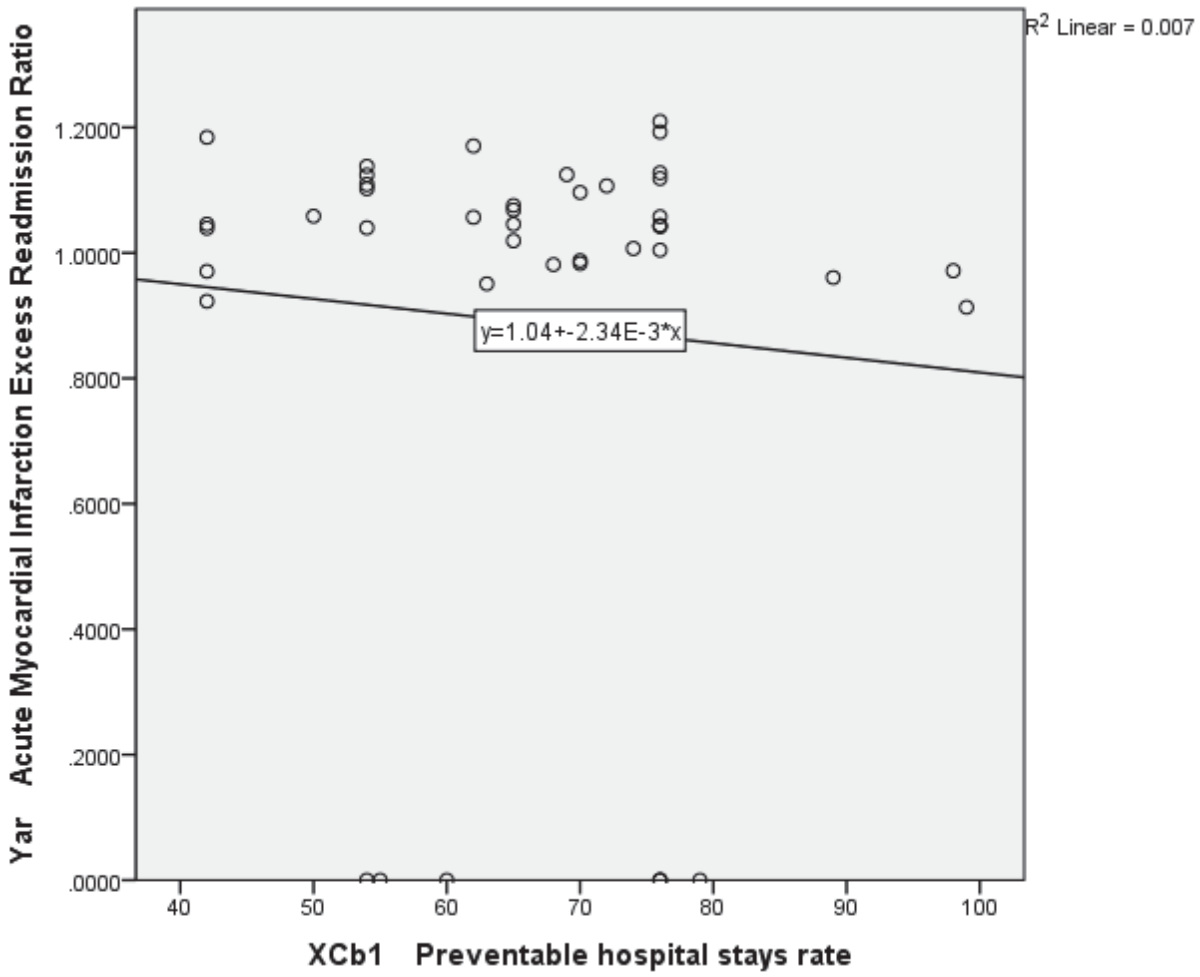
Thank you for your assistance. I will share my dissertation with you after I complete my statistical calculations.

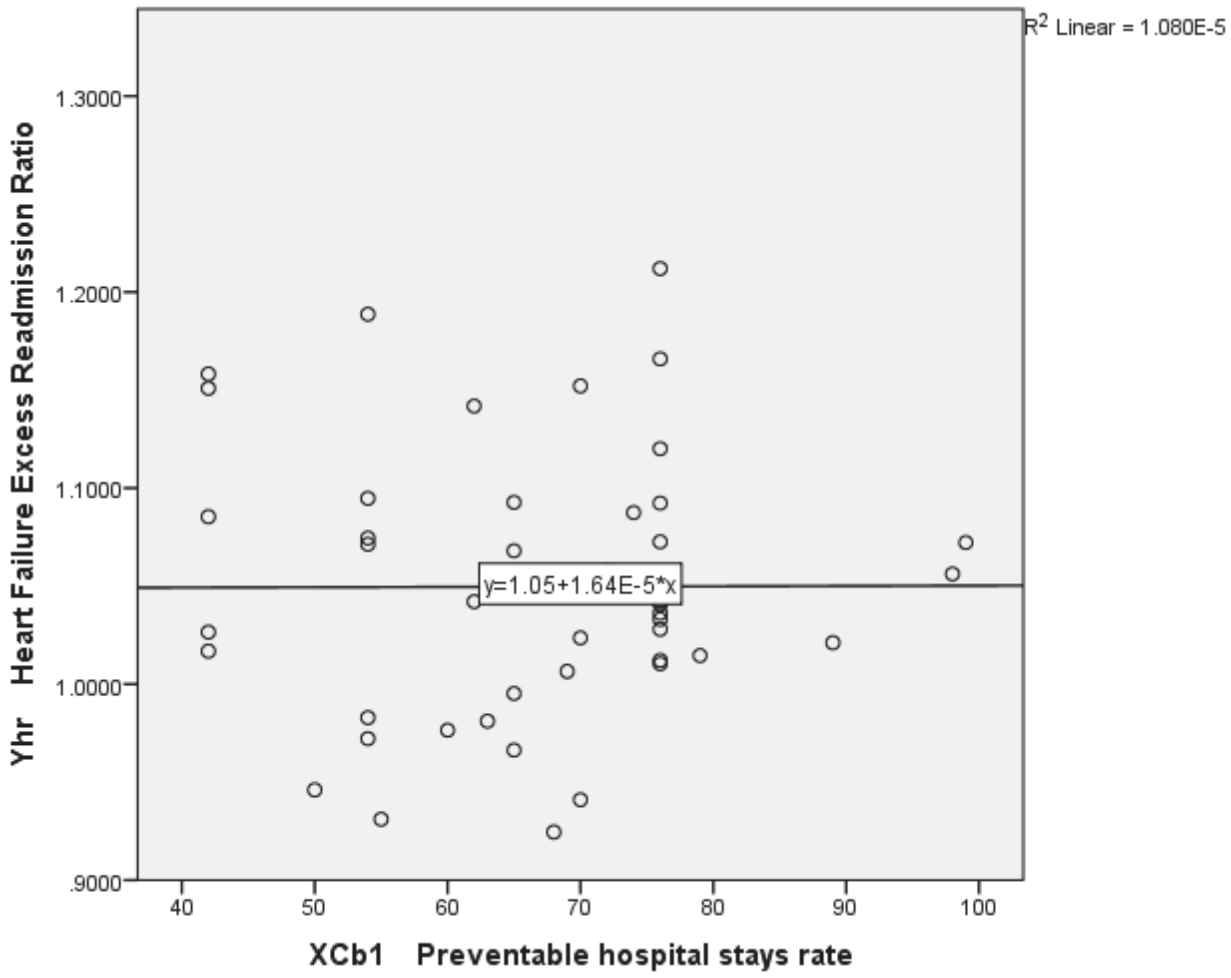
Camille R. Bash

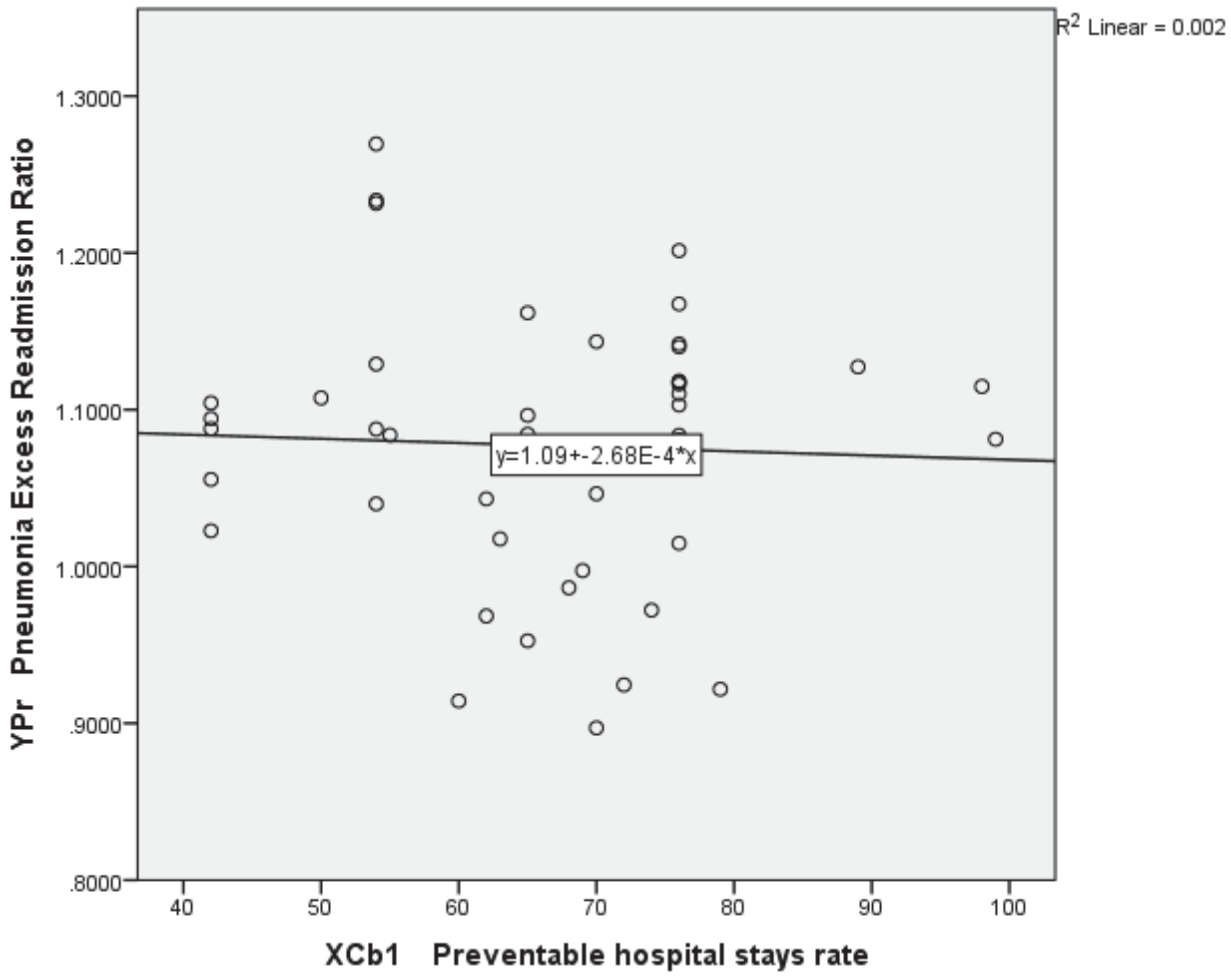
Camille.bash@waldenu.edu

Appendix F: Quality of Care Scatter Plots

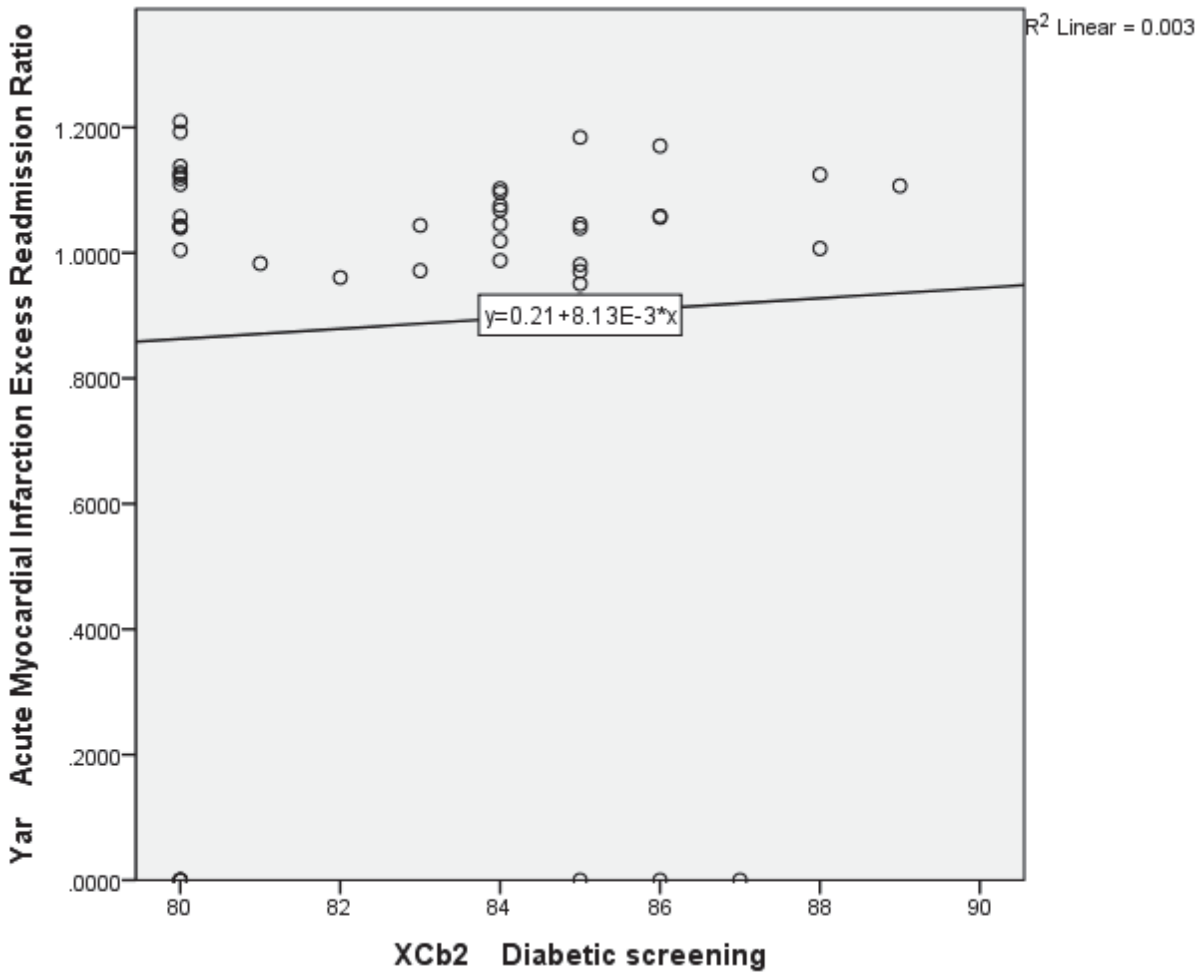
Preventable hospital stays

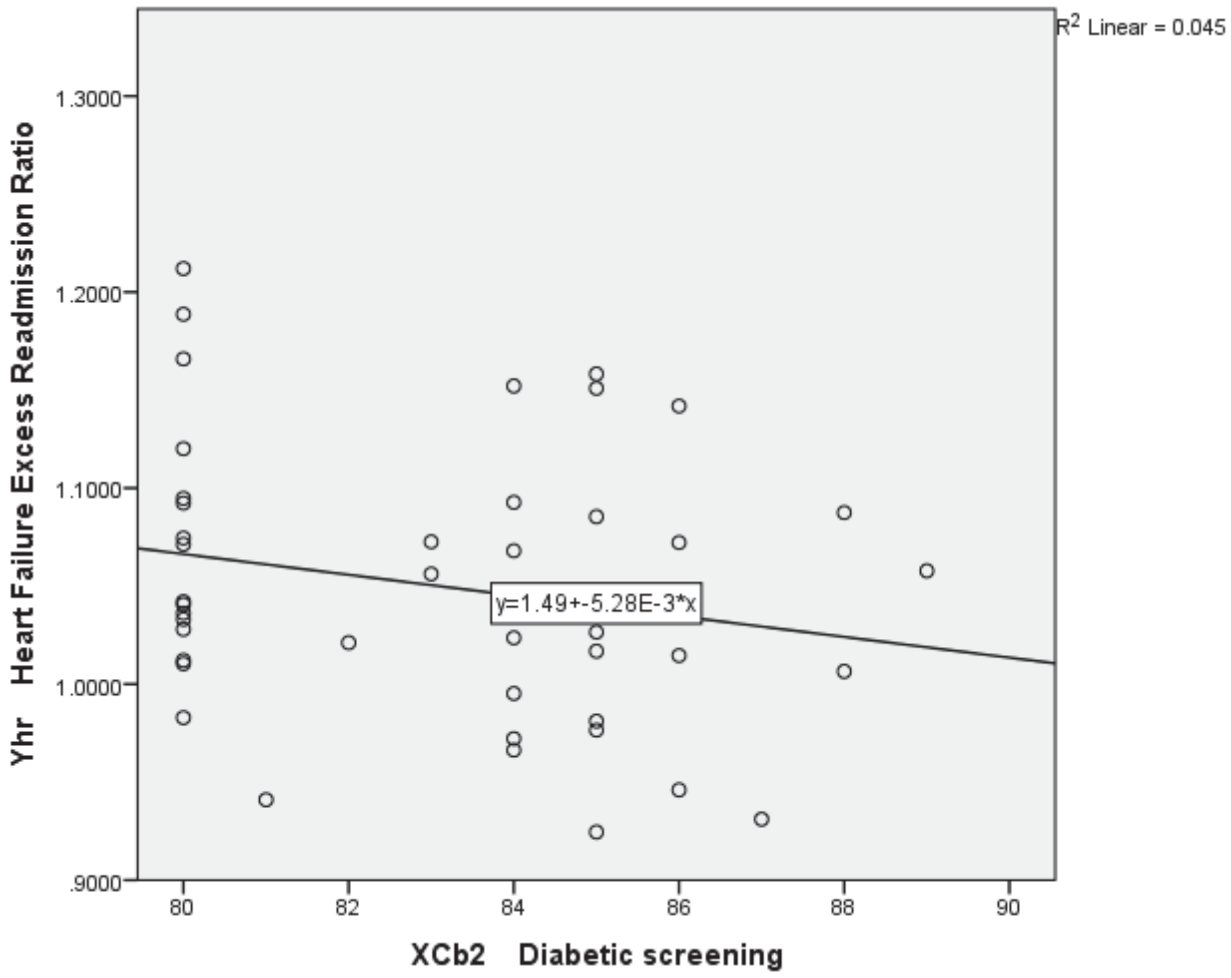


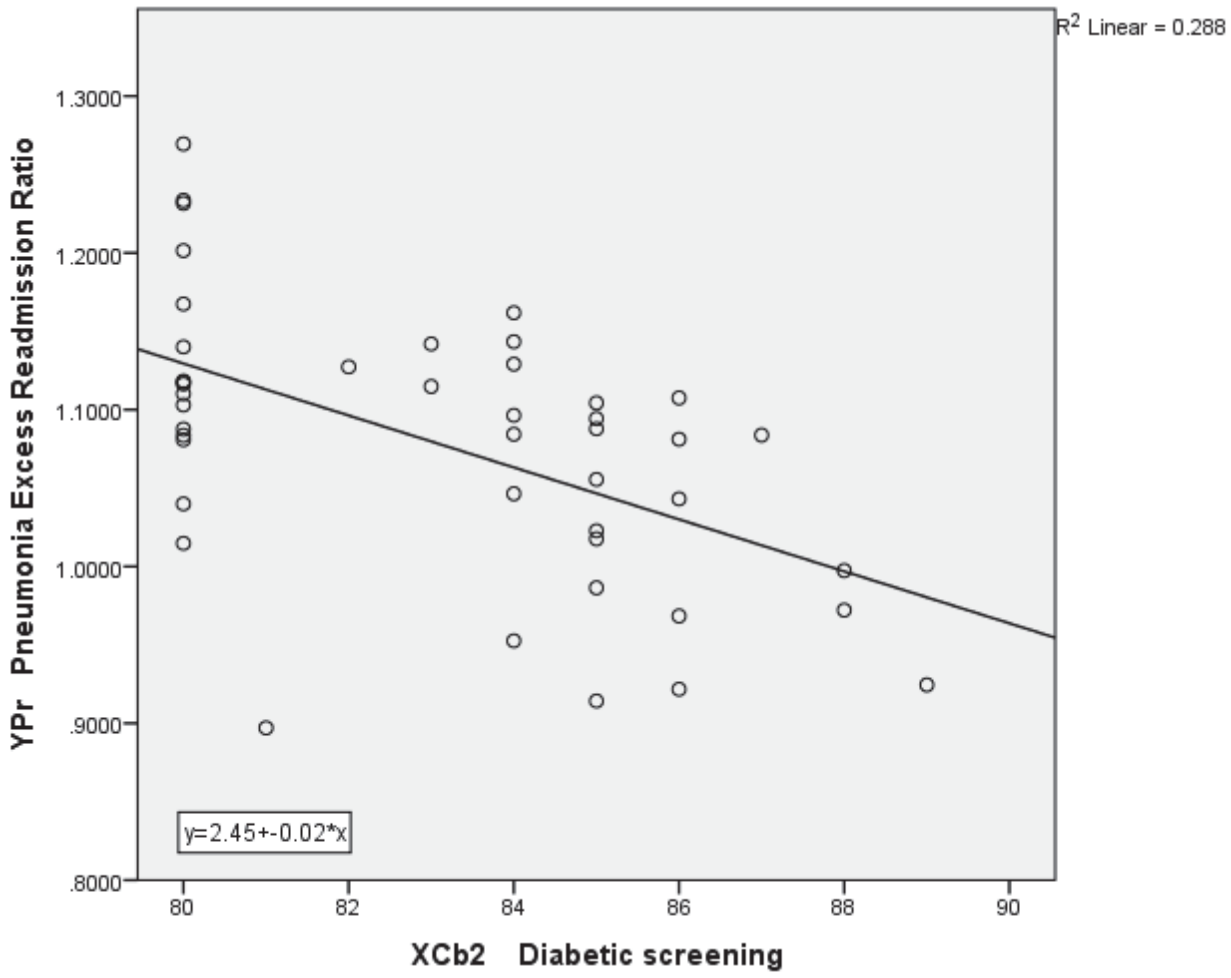

R2 Linear = 1.080E-5
y=1.05+1.64E-5*x
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
40
50
60
70
80
90
100
XCb1 Preventable hospital stays rate


R2 Linear = 0.002
y=1.09+-2.68E-4*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
40
50
60
70
80
90
100
XCb1 Preventable hospital stays rate

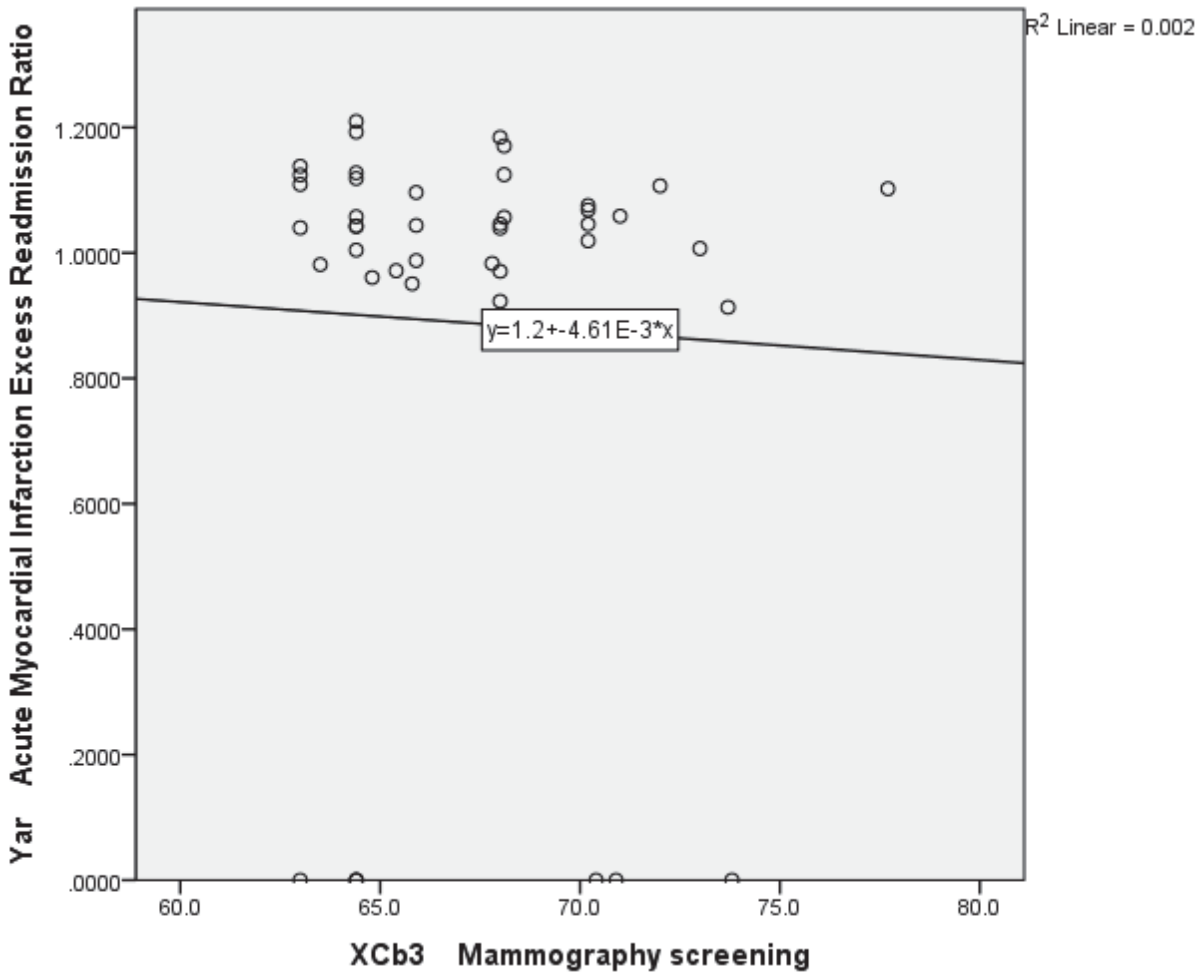
Diabetic Screening

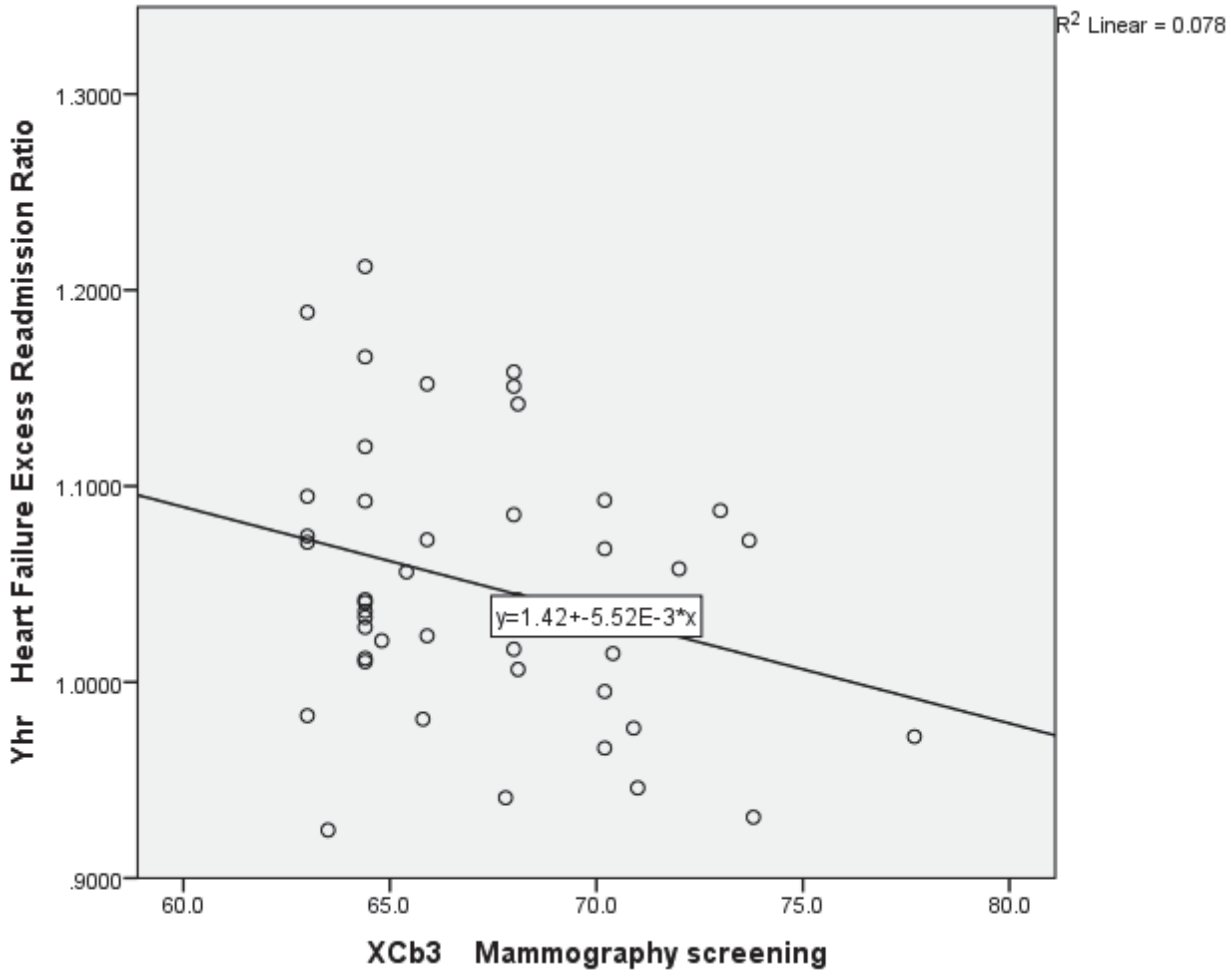


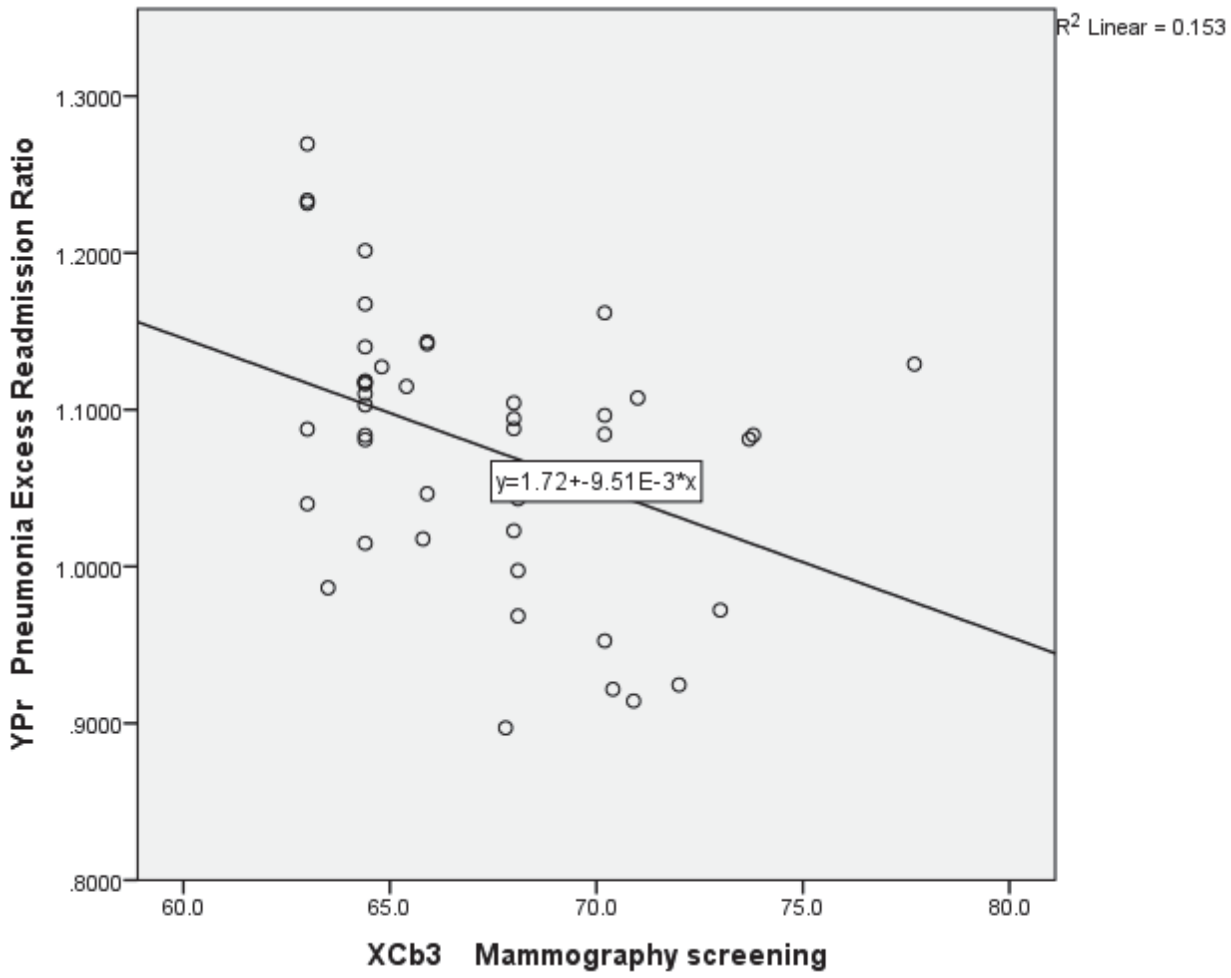

R2 Linear = 0.045
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.49+-5.28E-3*x
80
82
84
86
88
90
XCb2 Diabetic screening


R2 Linear = 0.288
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
y=2.45+-0.02*x
80
82
84
86
88
90
XCb2 Diabetic screening

Mammography Screening

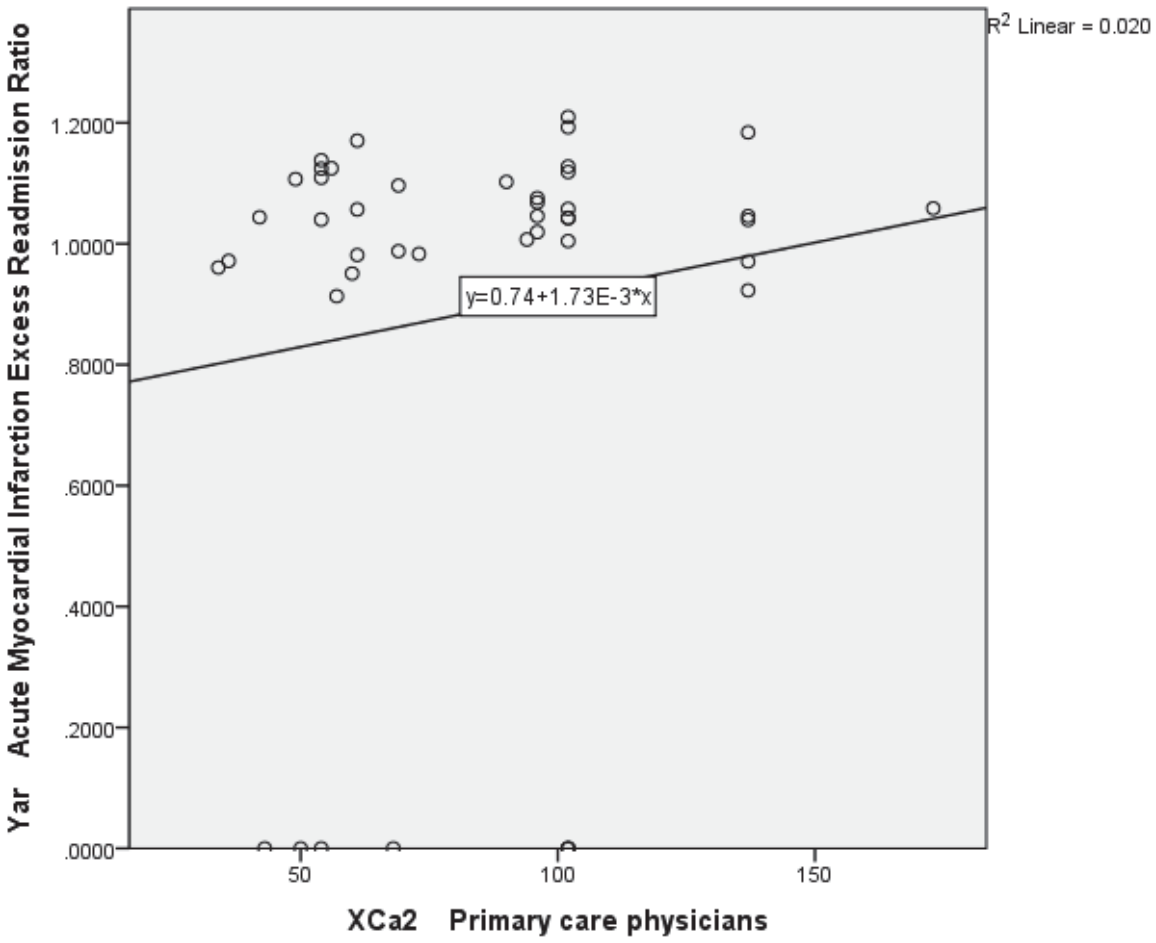


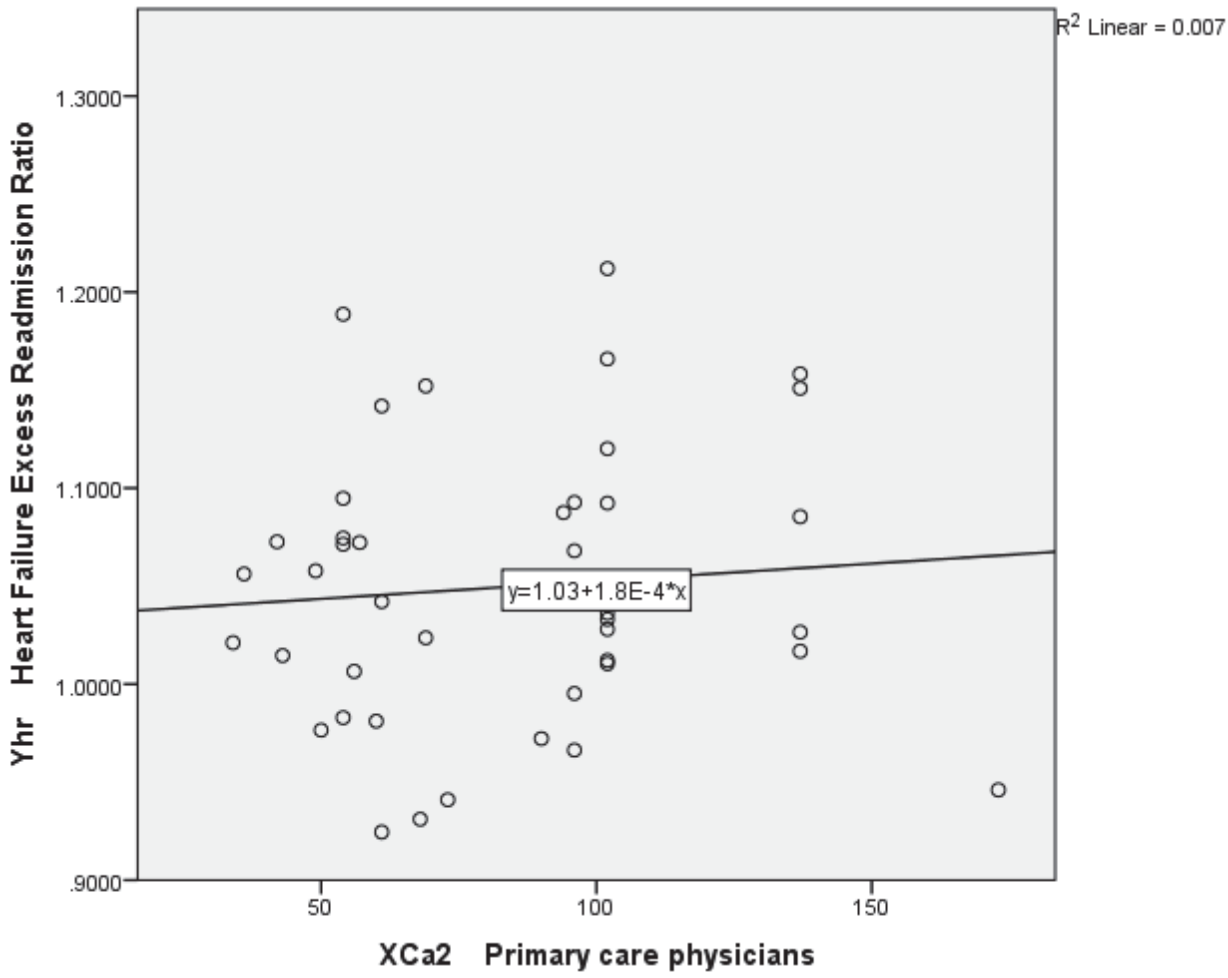

R2 Linear = 0.078
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.42+-5.52E-3*x
60.0
65.0
70.0
75.0
80.0
XCb3 Mammography screening

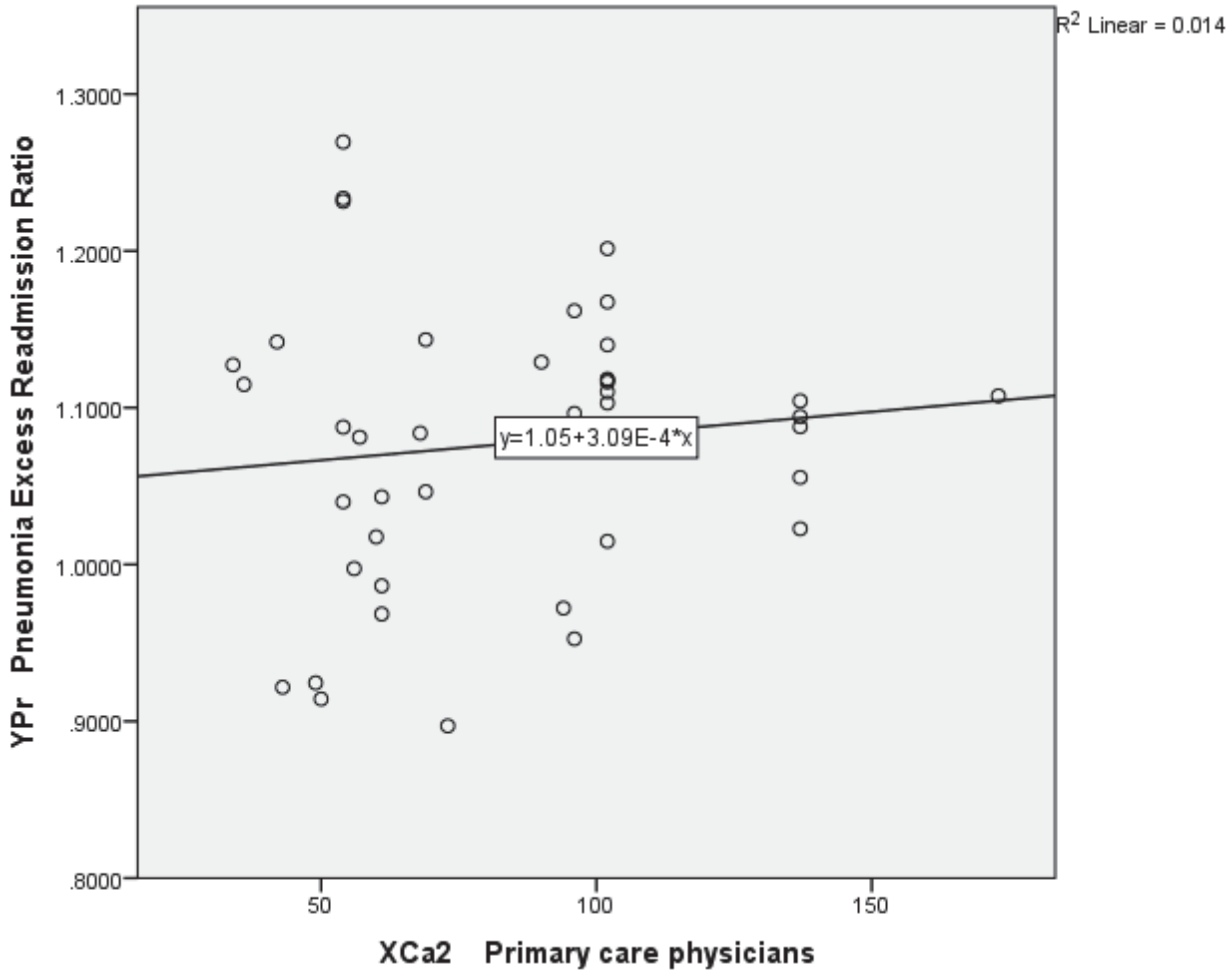

R2 Linear = 0.153
y=1.72+-9.51E-3*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
60.0
65.0
70.0
75.0
80.0
XCb3 Mammography screening

Appendix G: Access to Care Scatter Plots

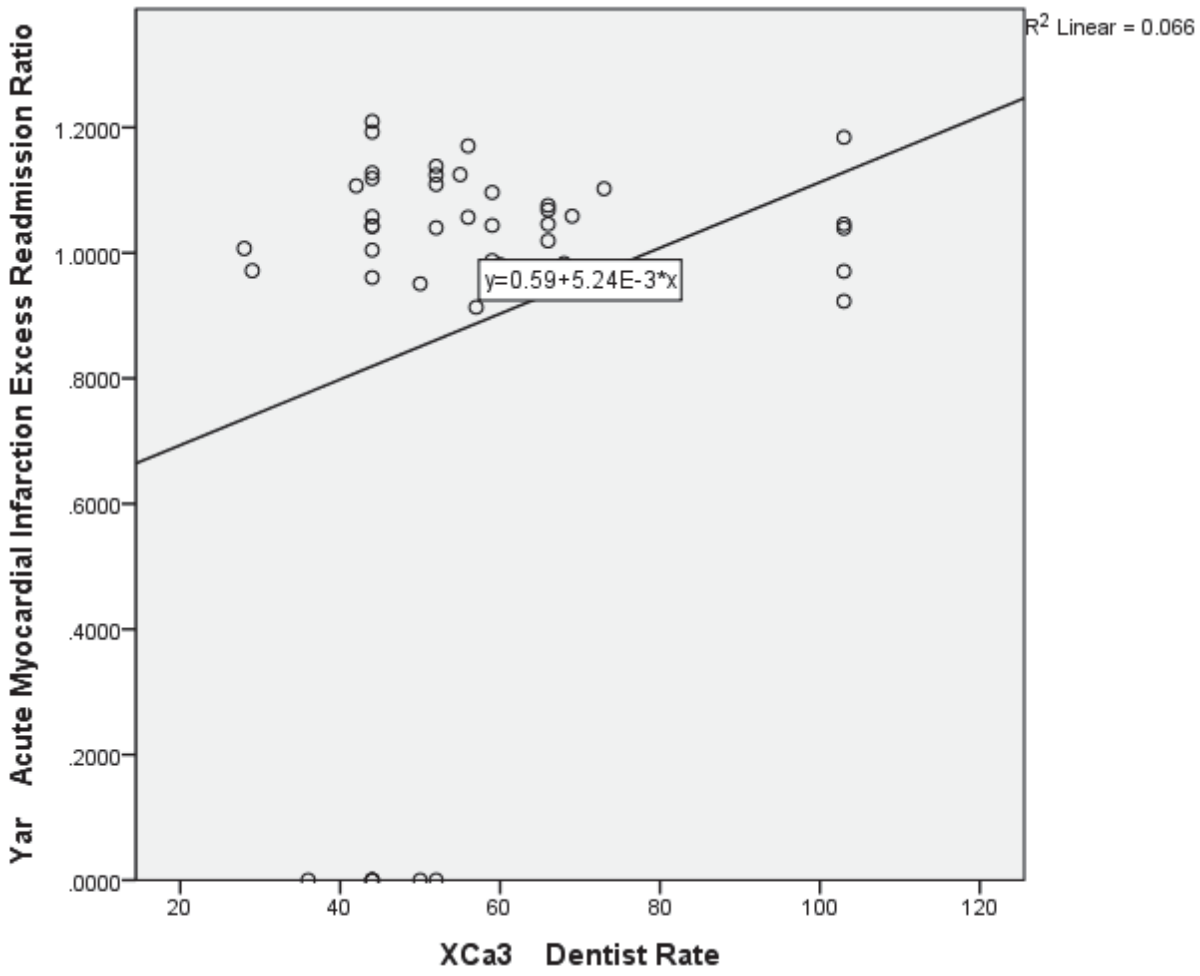
Primary care physicians

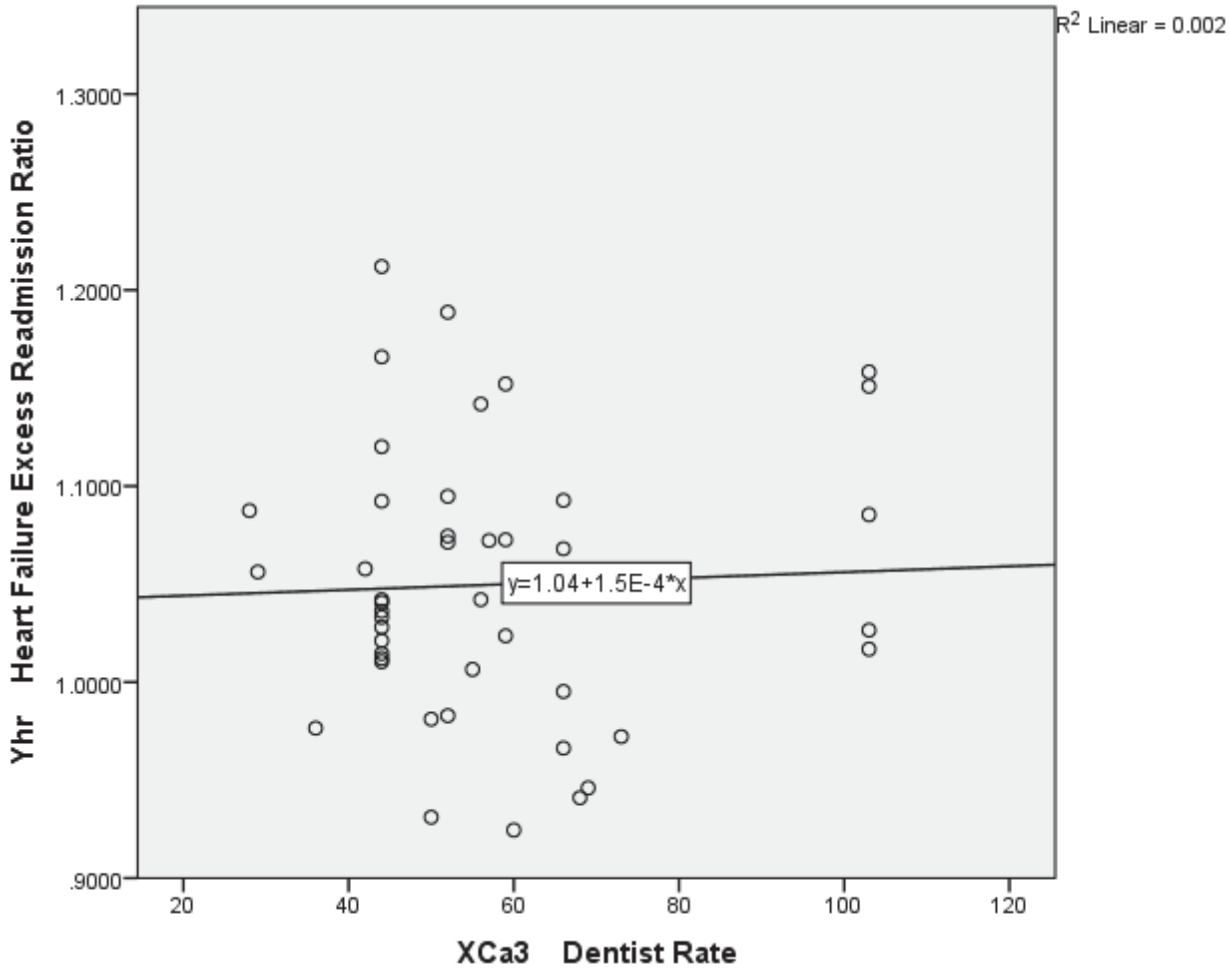


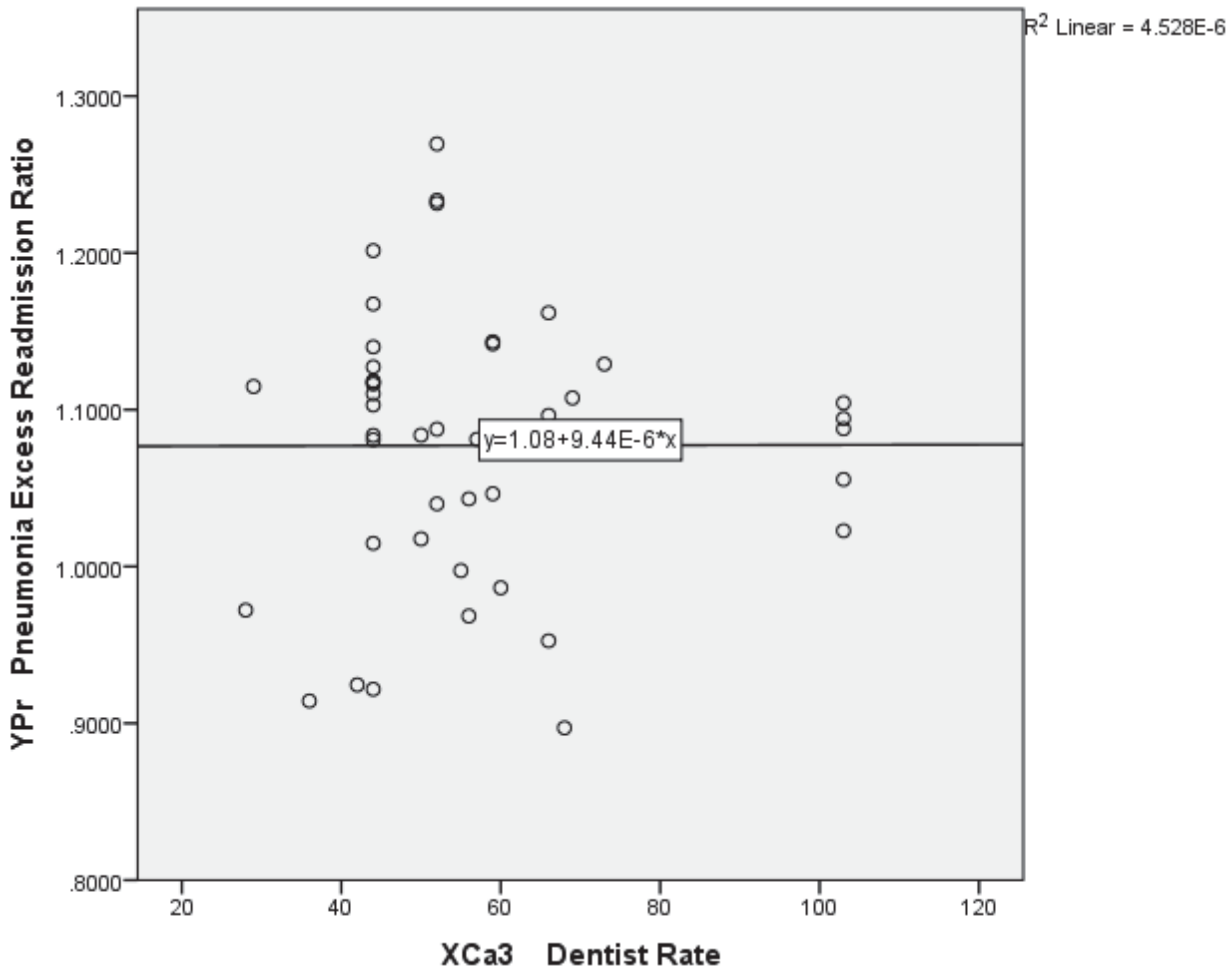

R2 Linear = 0.007
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.03+1.8E-4*x
50
100
150
XCa2 Primary care physicians


R2 Linear = 0.014
y=1.05+3.09E-4*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
50
100
150
XCa2 Primary care physicians

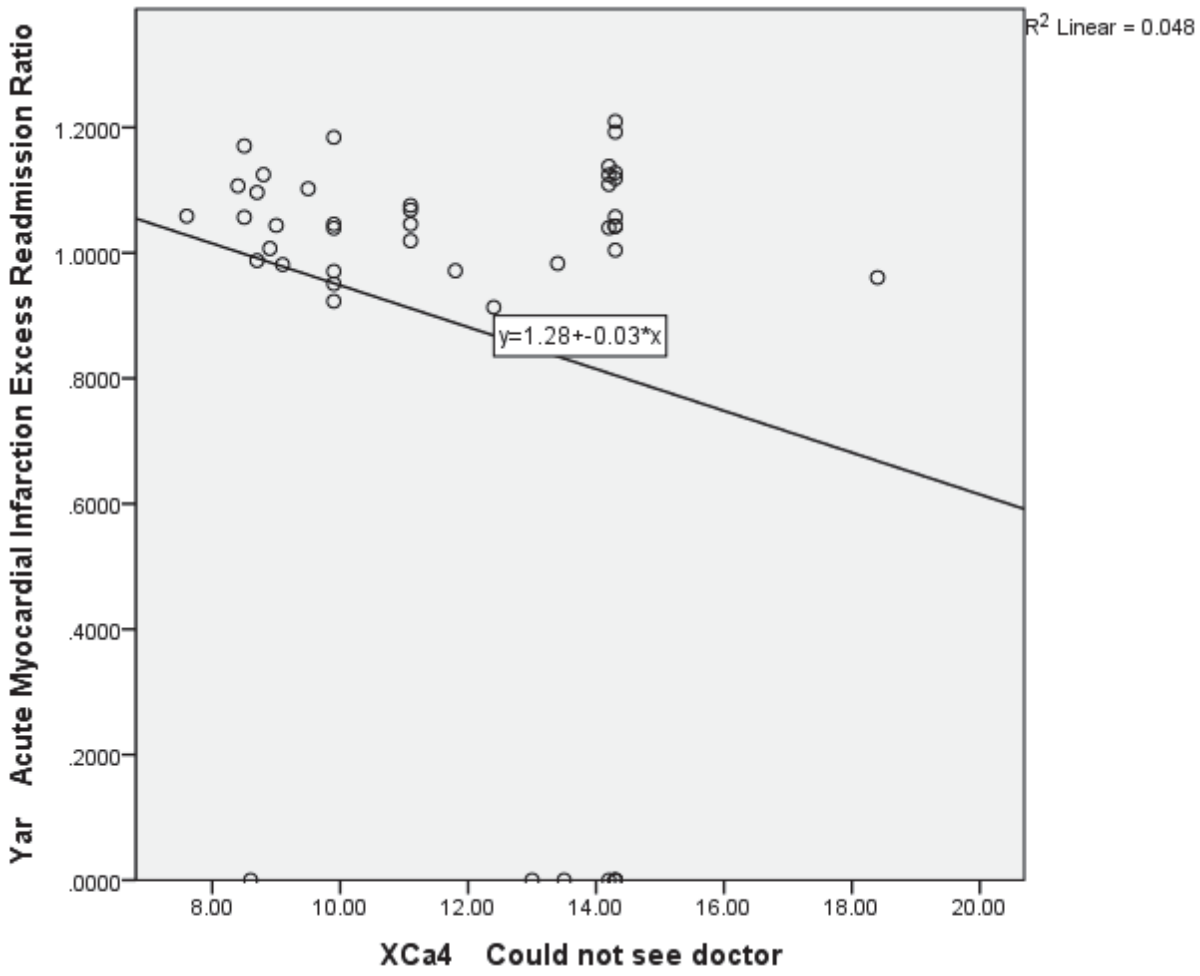
Dentists

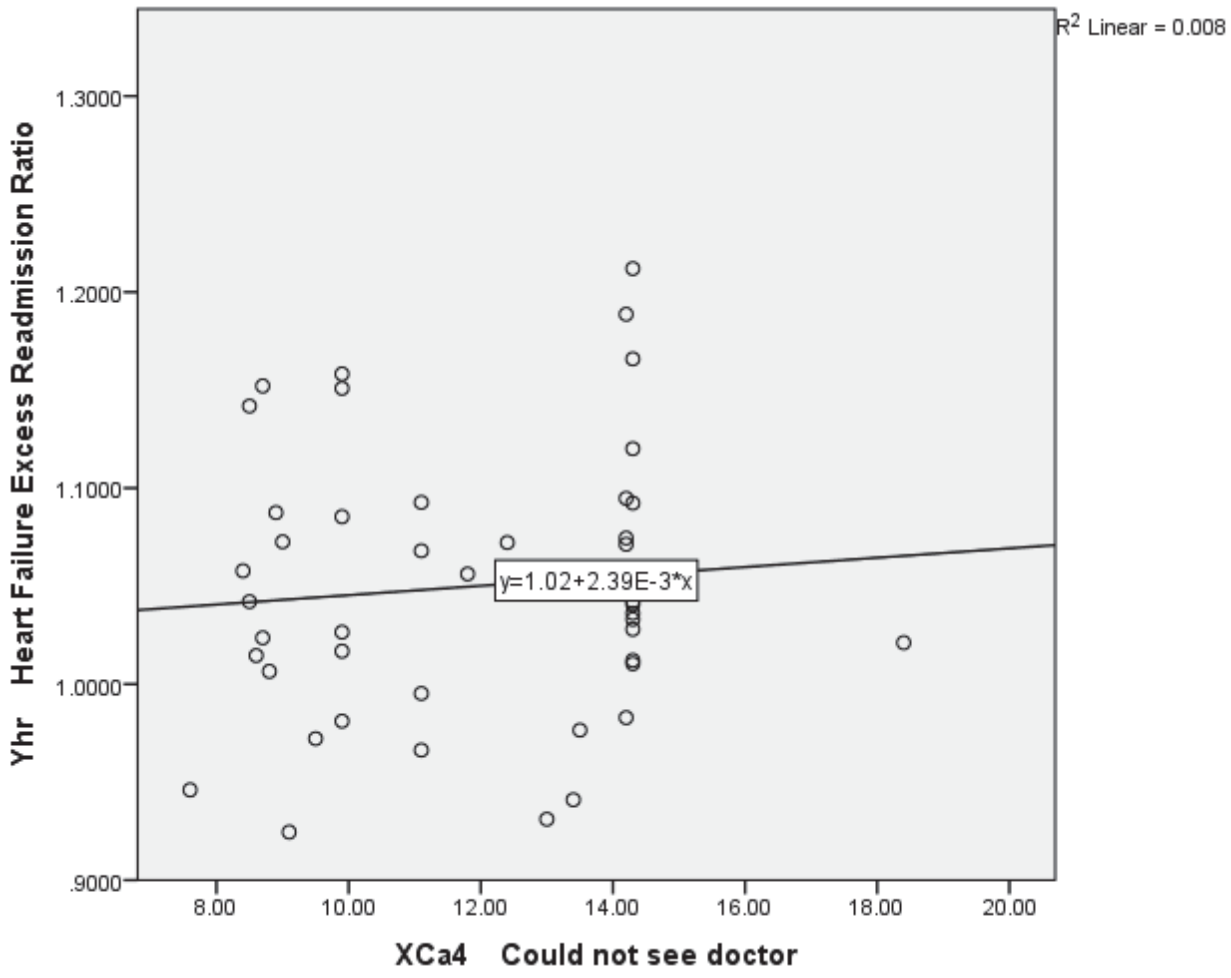

R2 Linear = 0.066
y=0.59+5.24E-3*x
Yar Acute Myocardial Infarction Excess Readmission Ratio
1.2000
1.0000
.8000
.6000
.4000
.2000
.0000
20
40
60
80
100
120
XCa3 Dentist Rate

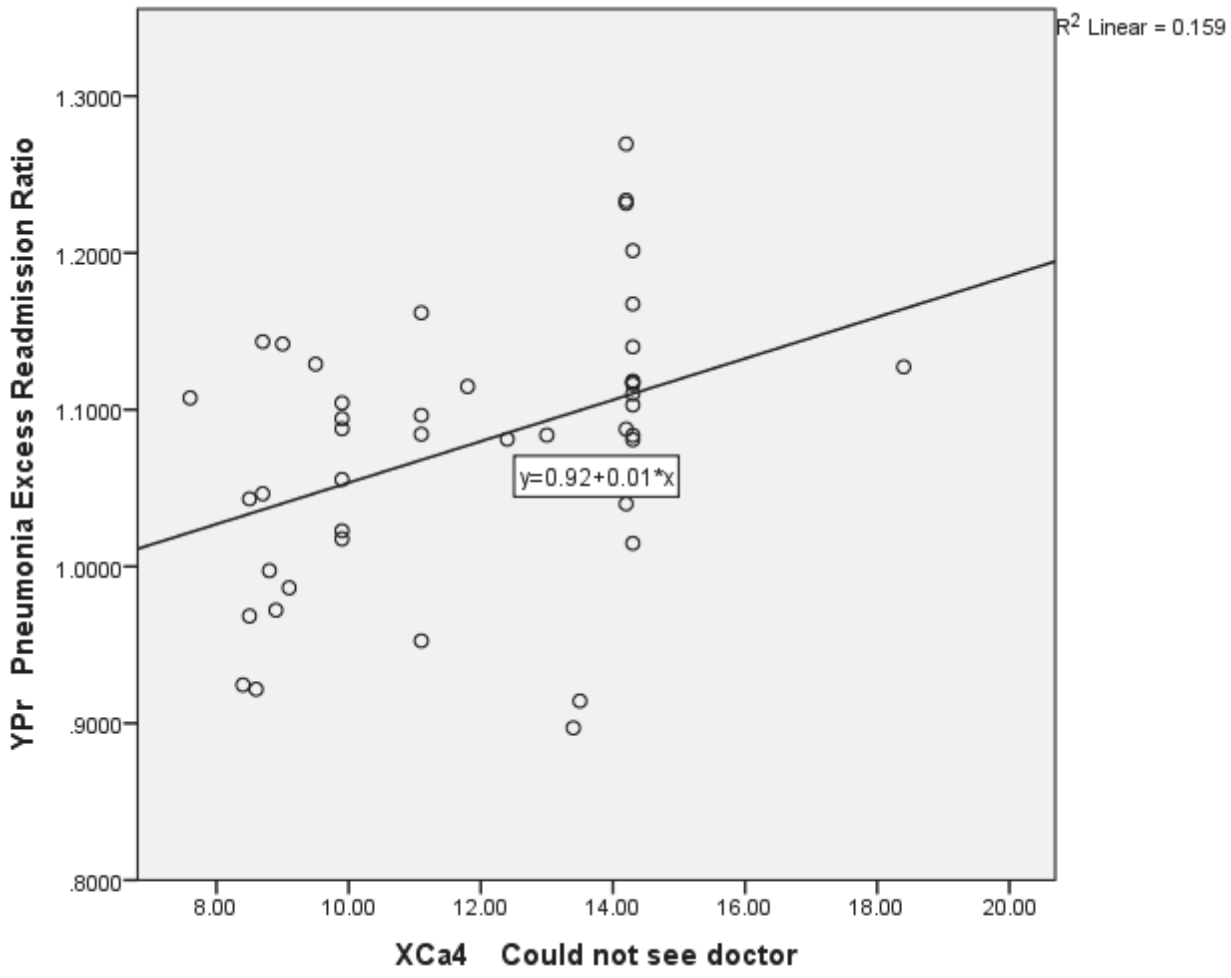

R2 Linear = 0.002
y=1.04+1.5E-4*x
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
20
40
60
80
100
120
XCa3 Dentist Rate


R2 Linear = 4.528E-6
y=1.08+9.44E-6*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
20
40
60
80
100
120
XCa3 Dentist Rate

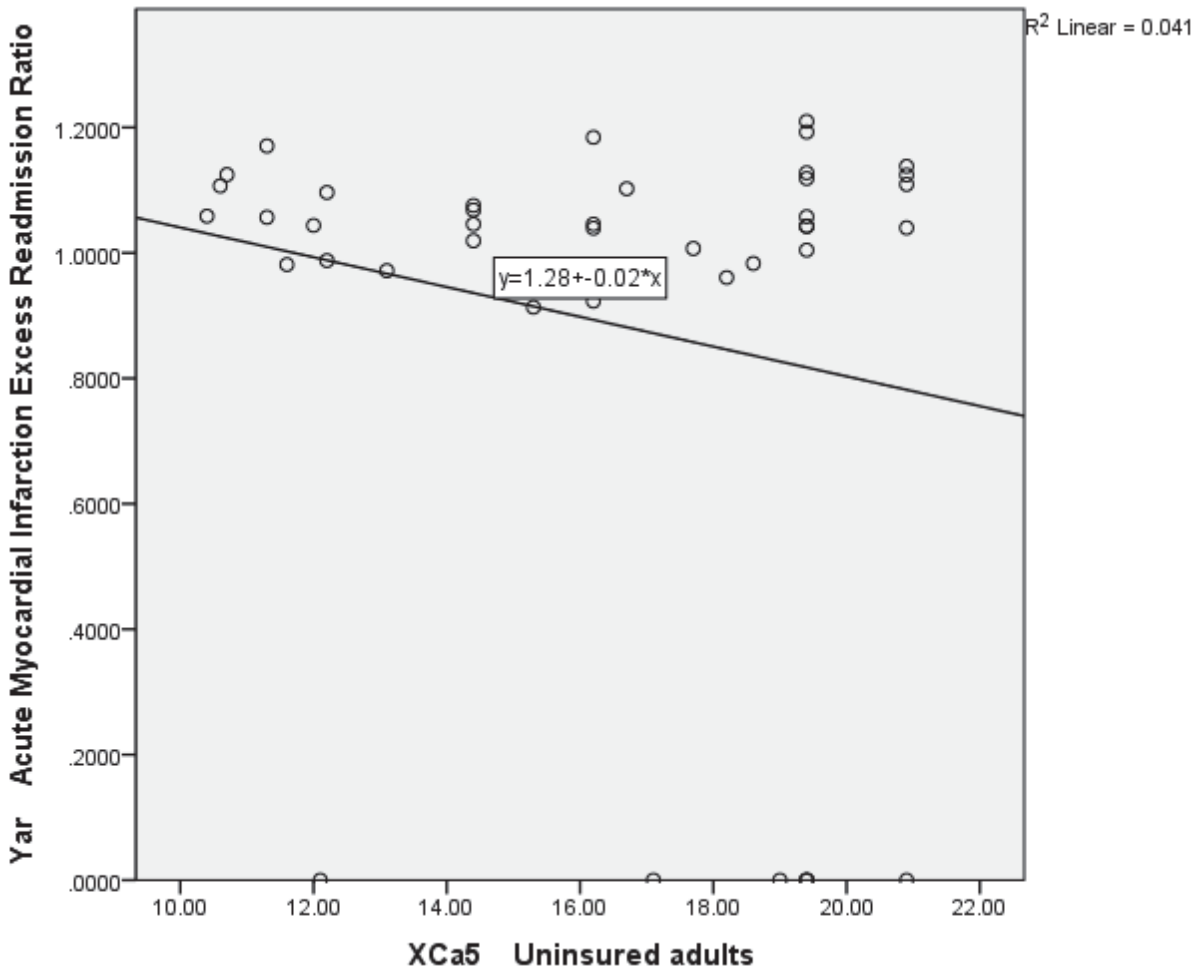
Could not see a doctor

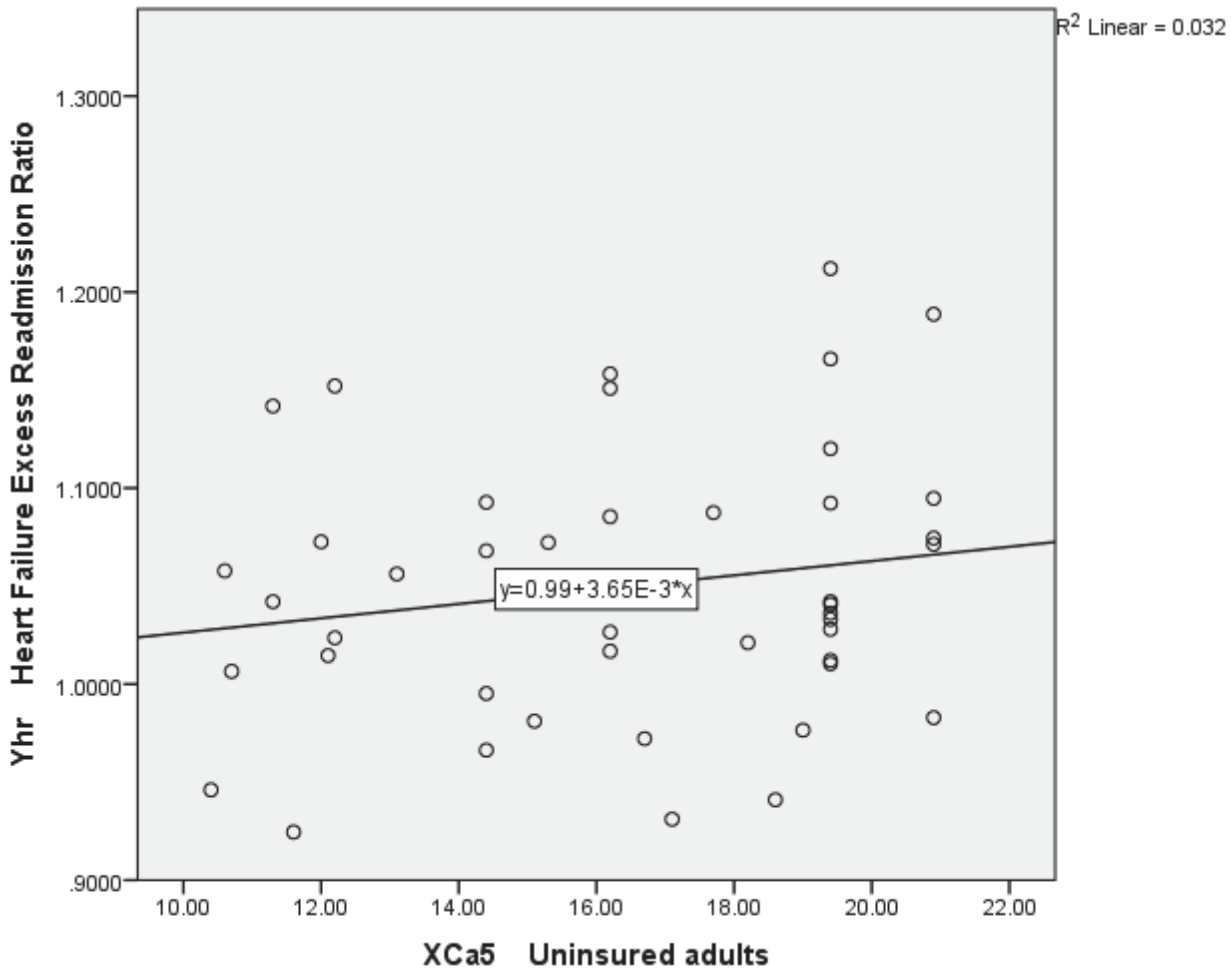


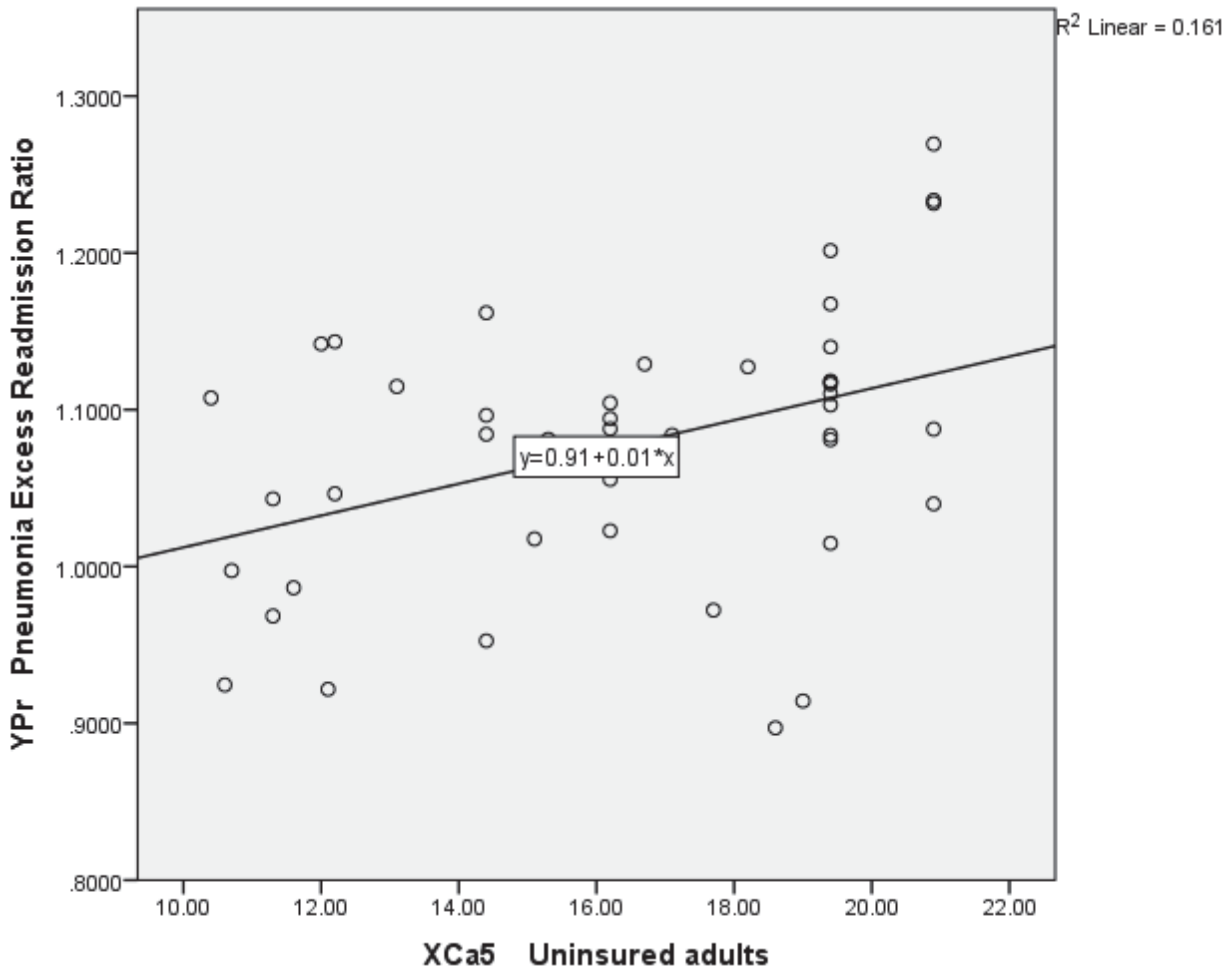

R2 Linear = 0.008
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.02+2.39E-3*x
8.00
10.00
12.00
14.00
16.00
18.00
20.00
XCa4 Could not see doctor


R2 Linear = 0.159
y=0.92+0.01*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
8.00
10.00
12.00
14.00
16.00
18.00
20.00
XCa4 Could not see doctor

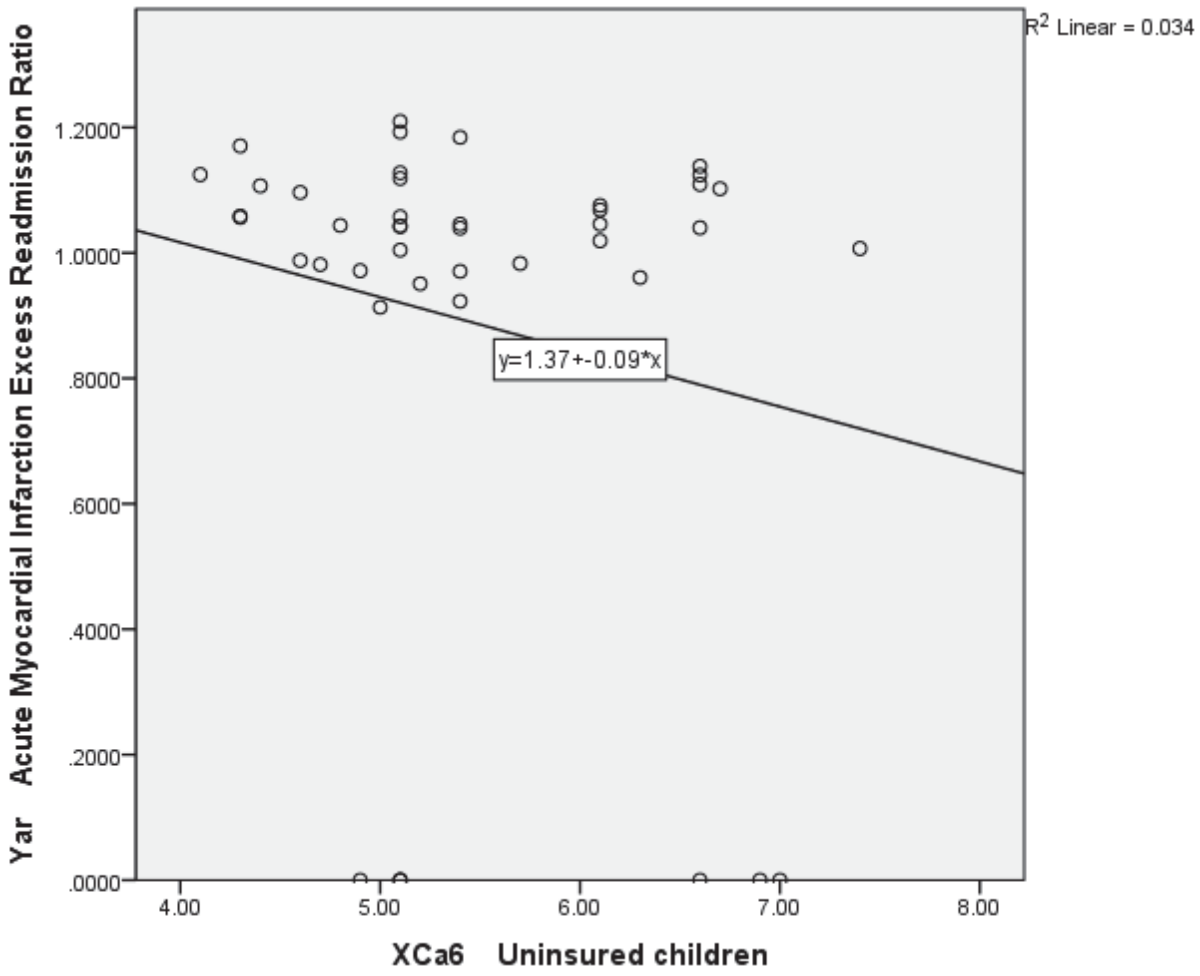
Uninsured Adults

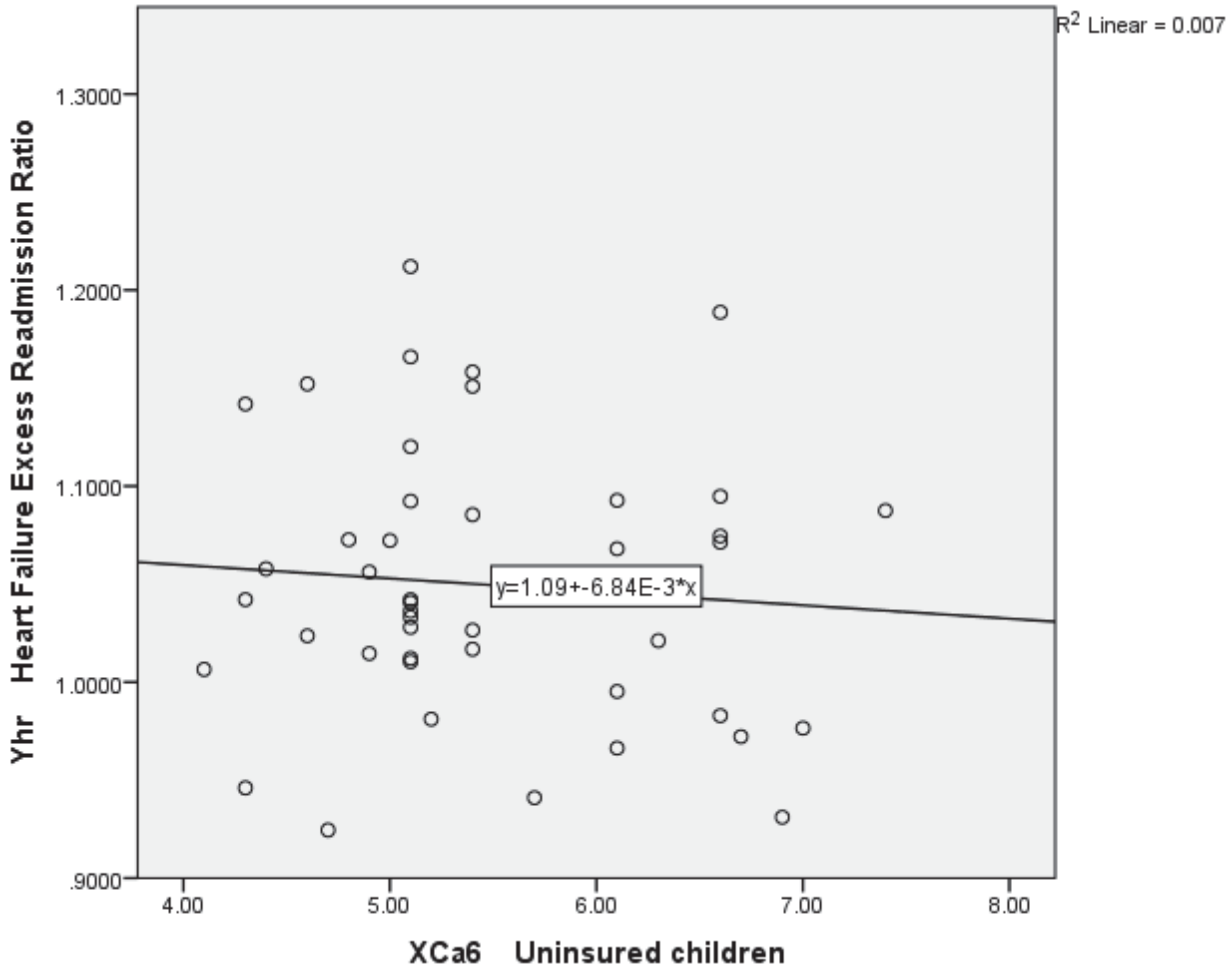


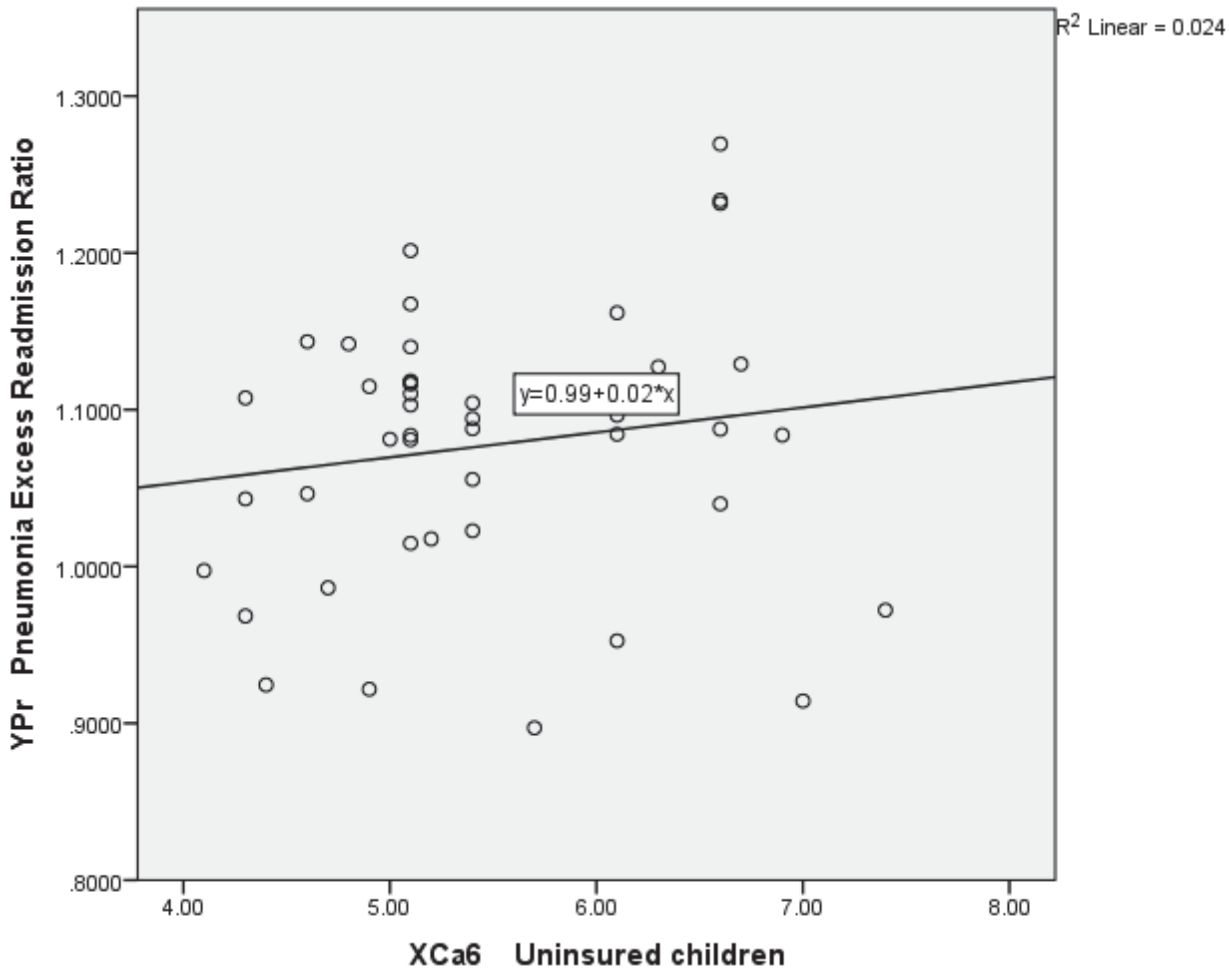

R2 Linear = 0.032
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=0.99+3.65E-3*x
10.00
12.00
14.00
16.00
18.00
20.00
22.00
XCa5 Uninsured adults


R2 Linear = 0.161
y=0.91+0.01*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
10.00
12.00
14.00
16.00
18.00
20.00
22.00
XCa5 Uninsured adults

Uninsured Children

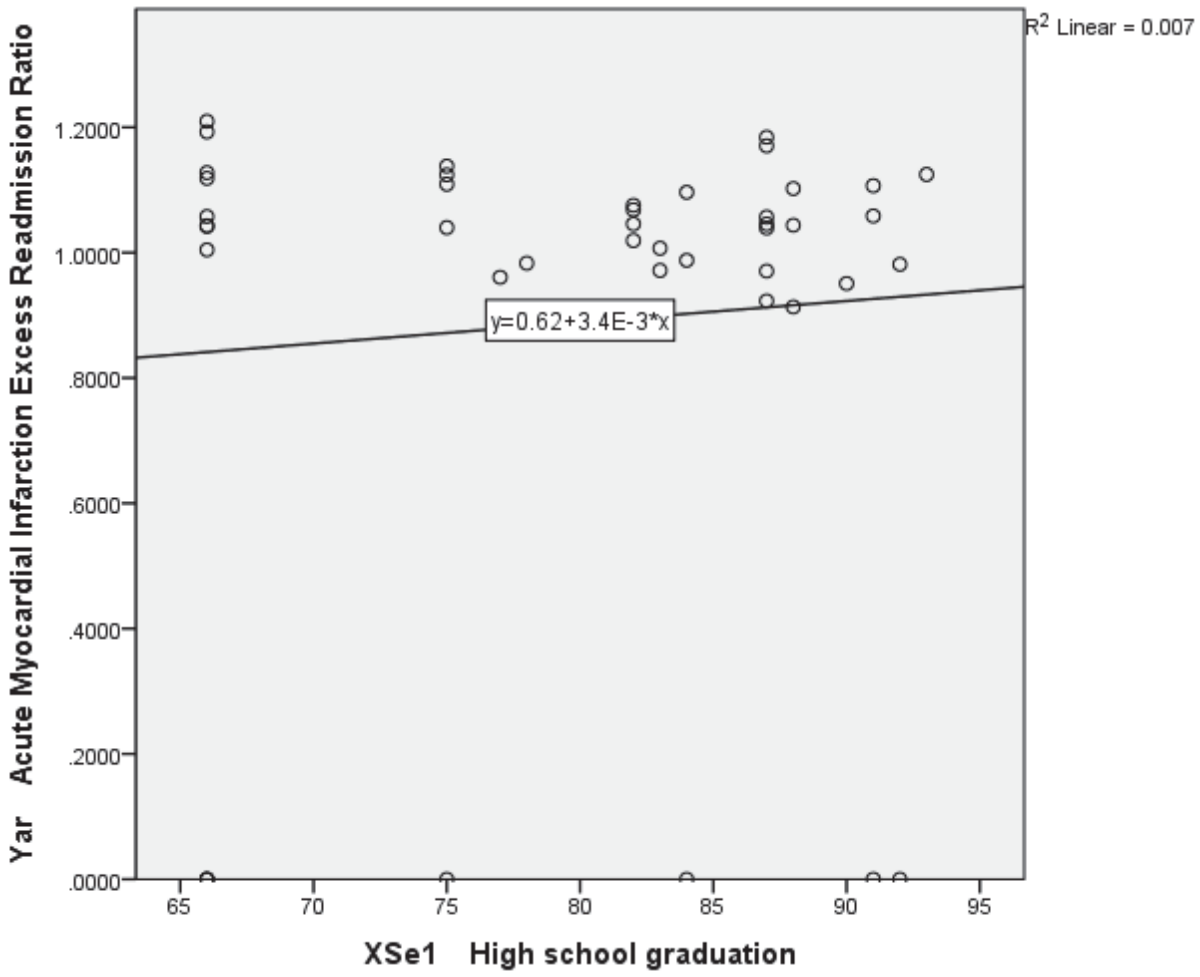


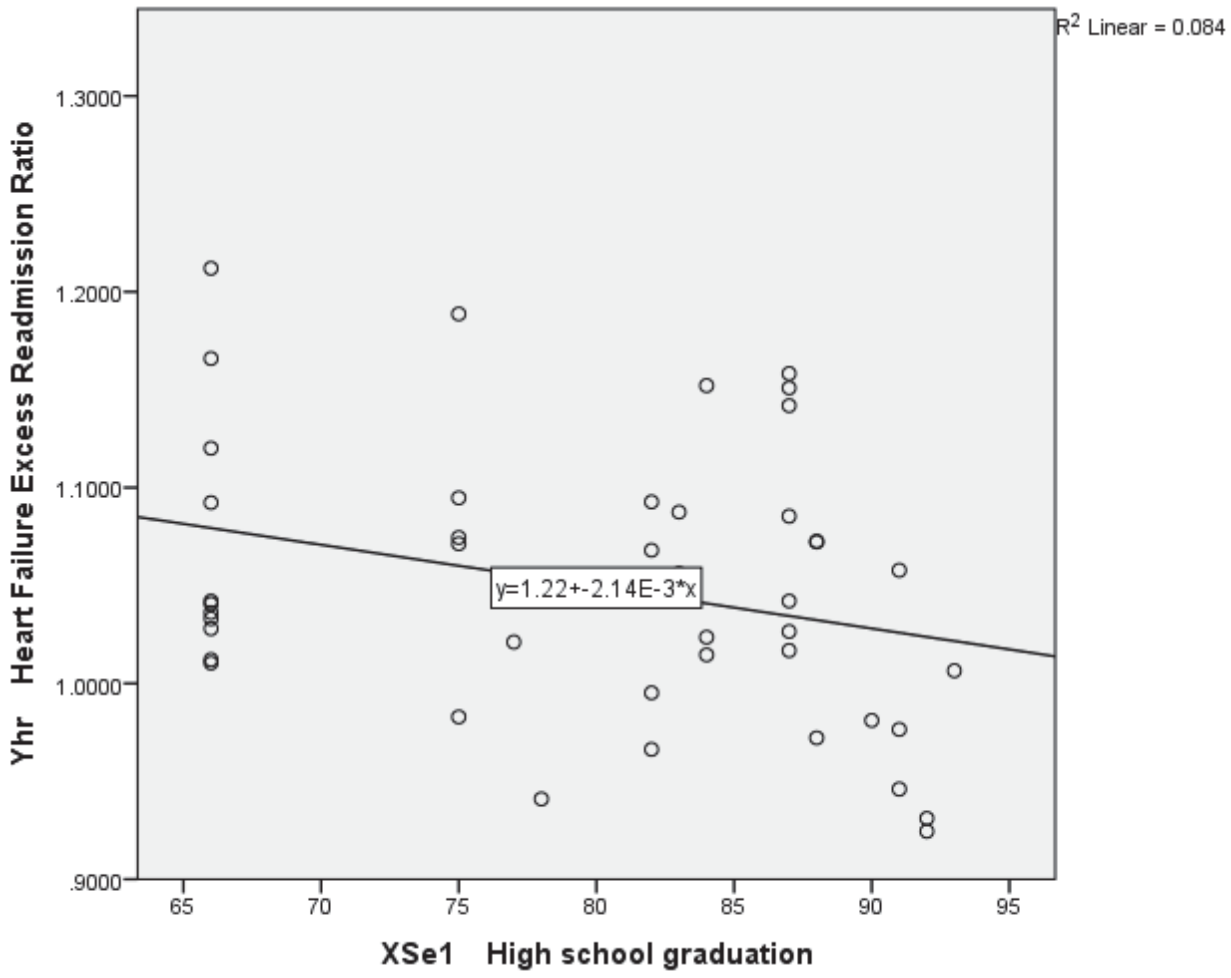

R2 Linear = 0.007
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.09+-6.84E-3*x
4.00
5.00
6.00
7.00
8.00
XCa6 Uninsured children

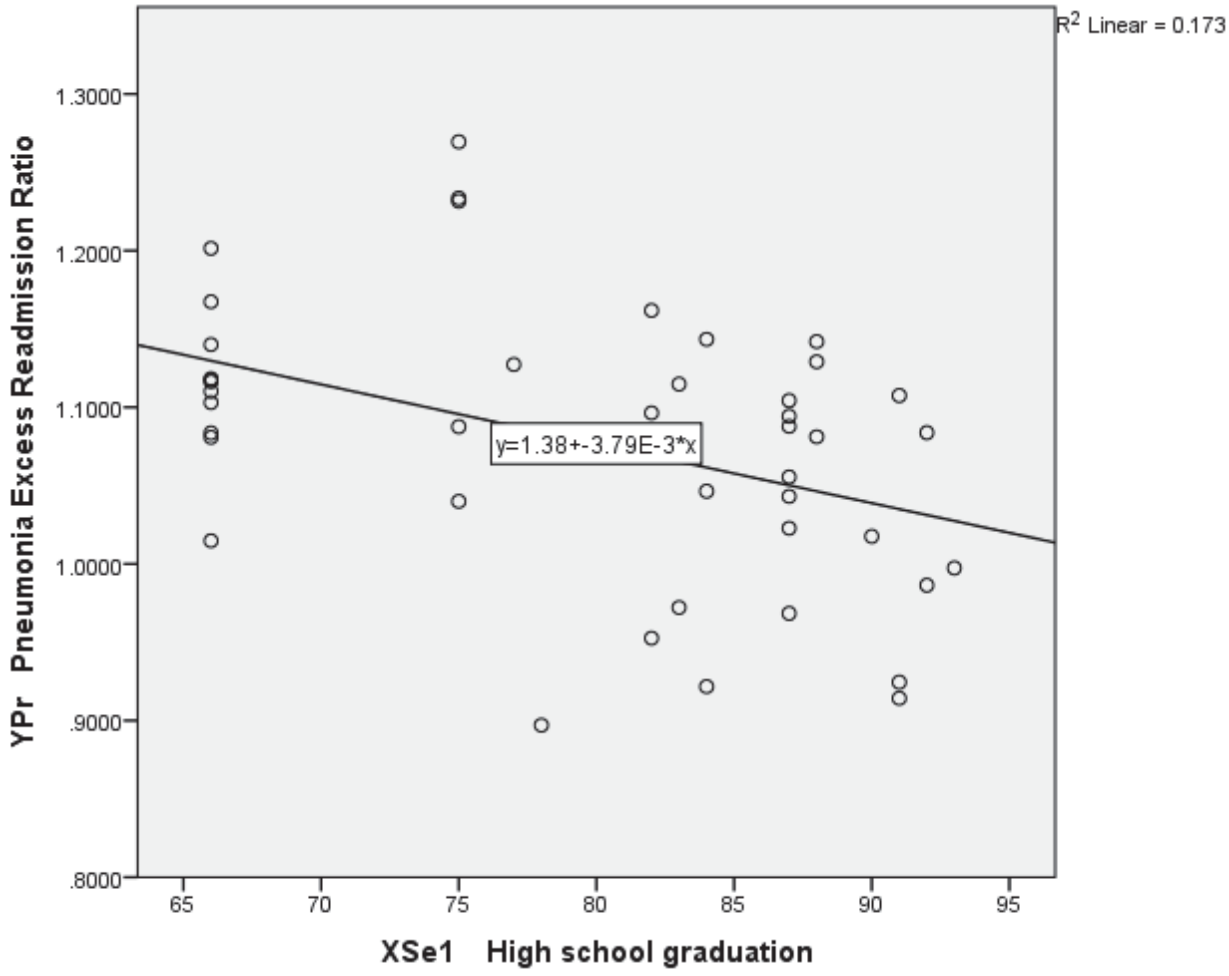

R2 Linear = 0.024
y=0.99+0.02*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
4.00
5.00
6.00
7.00
8.00
XCa6 Uninsured children

Appendix H: Social and Economics Scatter Plots

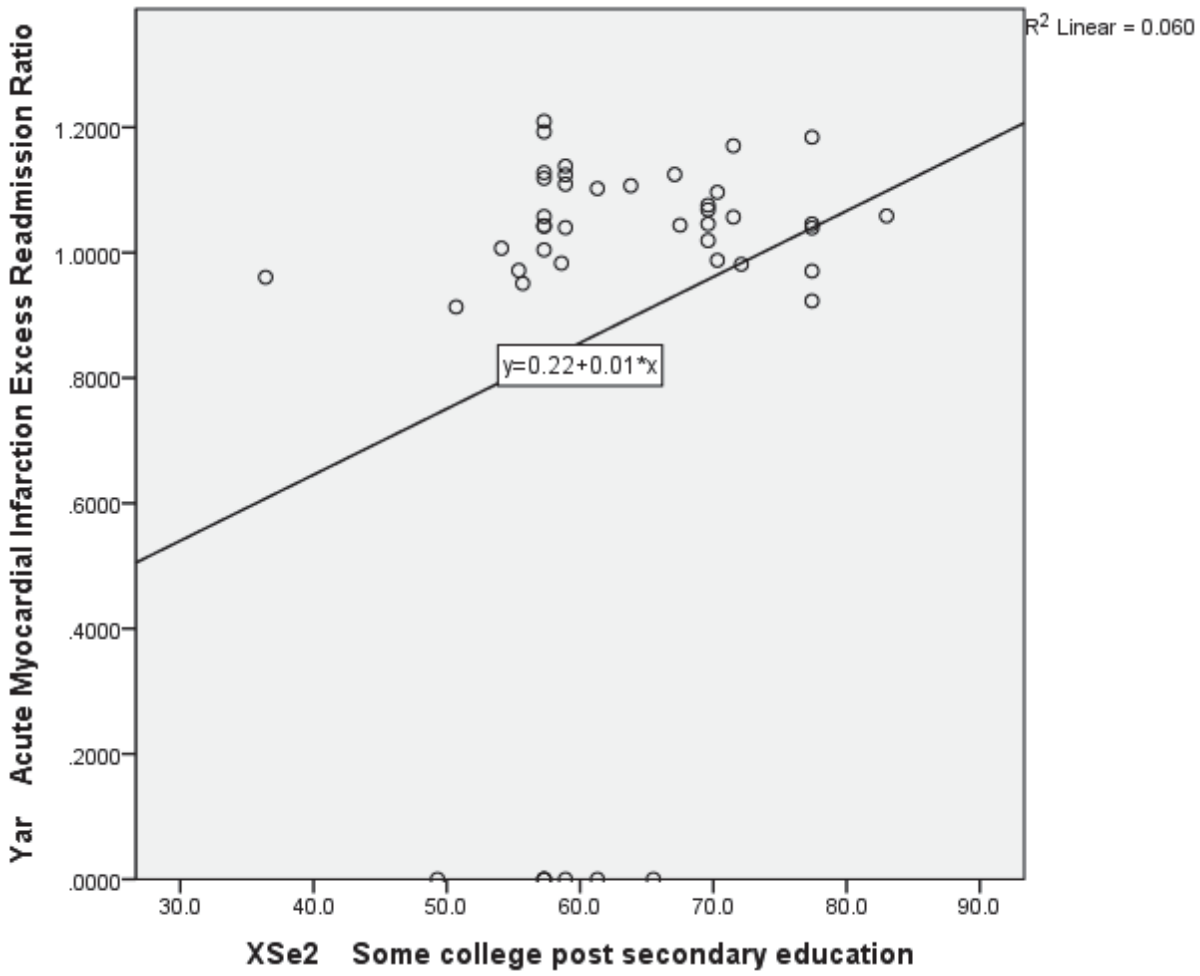
Education: High school education

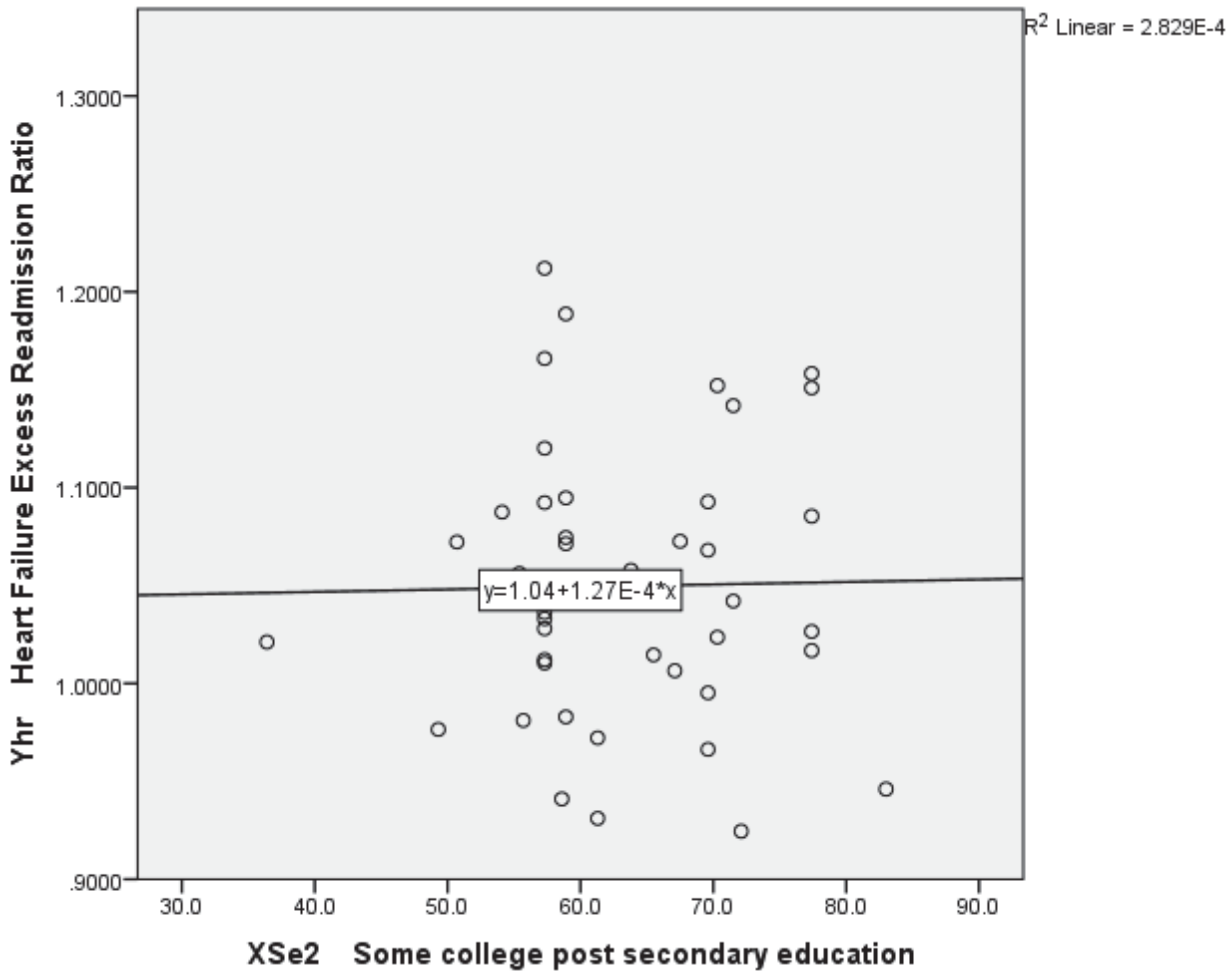


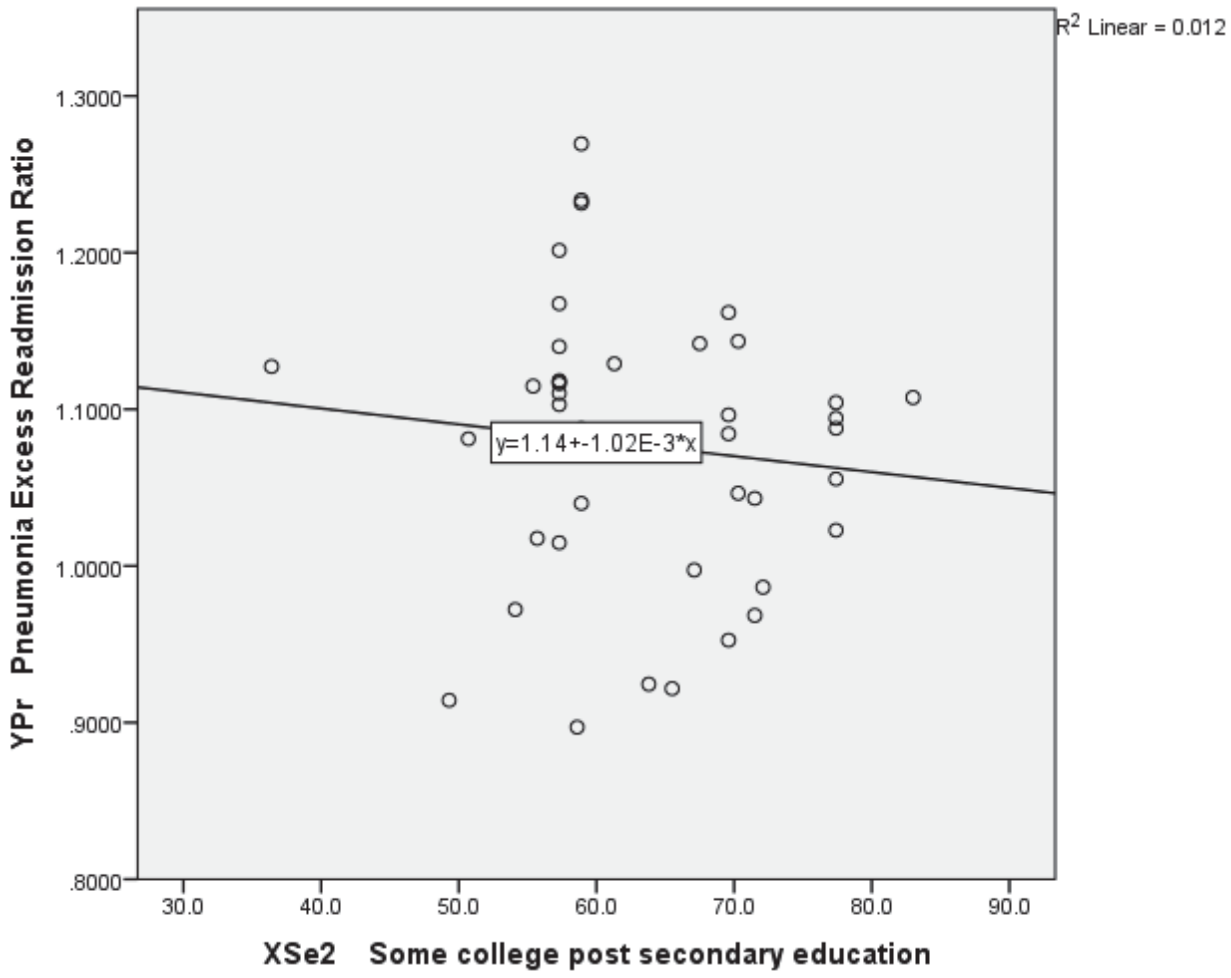

R2 Linear = 0.084
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.22+-2.14E-3*x
65
70
75
80
85
90
95
XSe1 High school graduation


R2 Linear = 0.173
y=1.38+-3.79E-3*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
65
70
75
80
85
90
95
XSe1 High school graduation

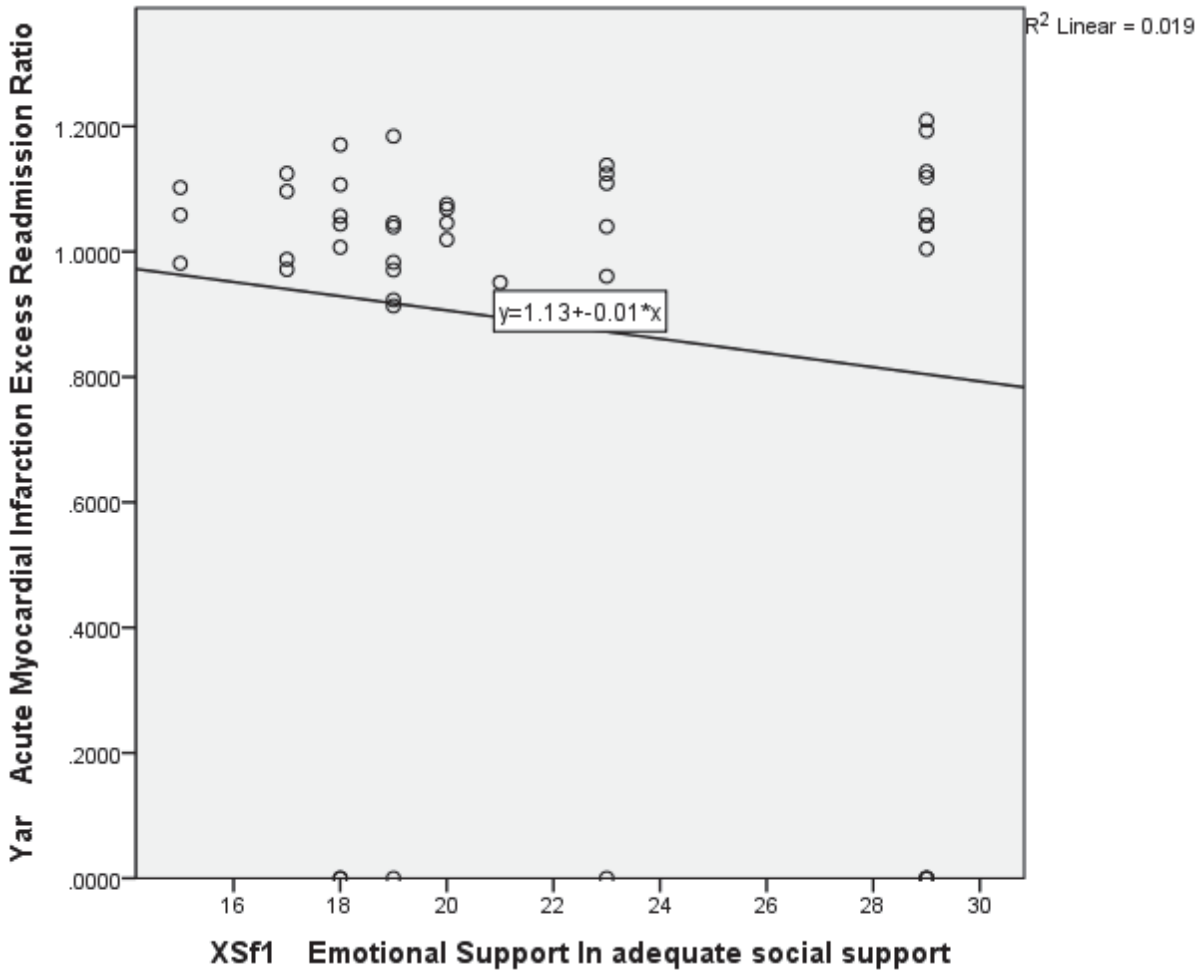
Education: Some college post secondary education

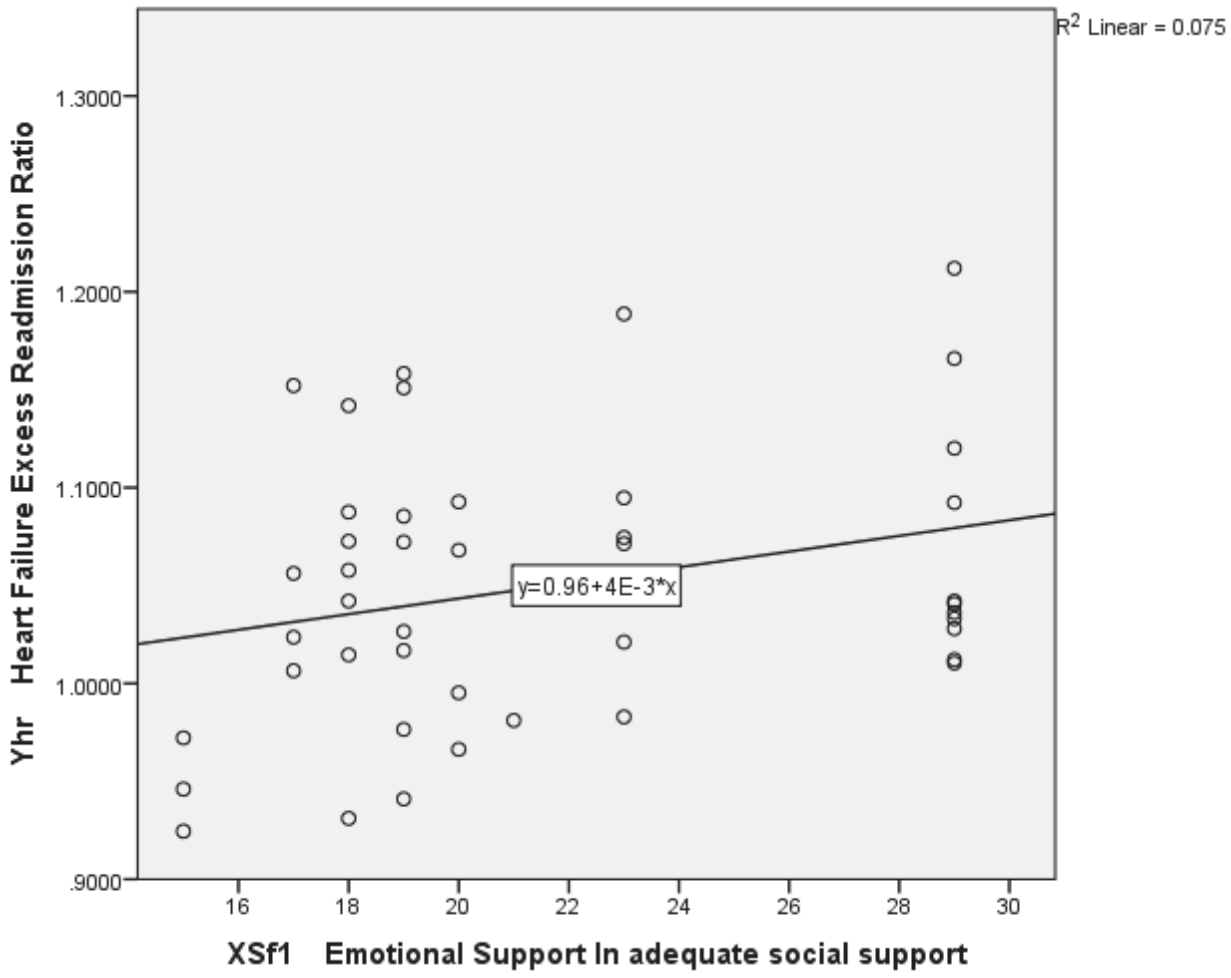


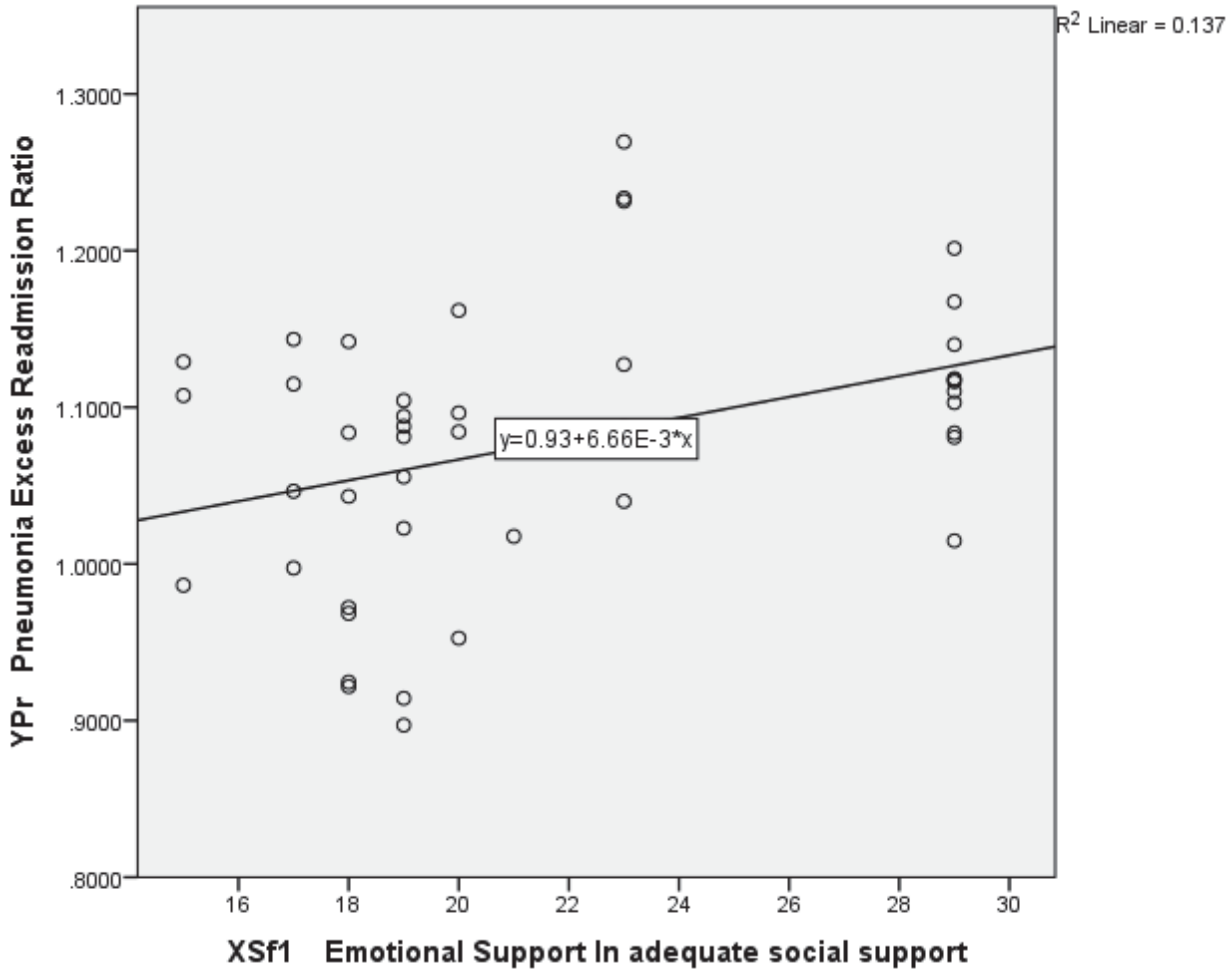

R2 Linear = 2.829E-4
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.04+1.27E-4*x
30.0
40.0
50.0
60.0
70.0
80.0
90.0
XSe2 Some college post secondary education


R2 Linear = 0.012
y=1.14+-1.02E-3*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
30.0
40.0
50.0
60.0
70.0
80.0
90.0
XSe2 Some college post secondary education

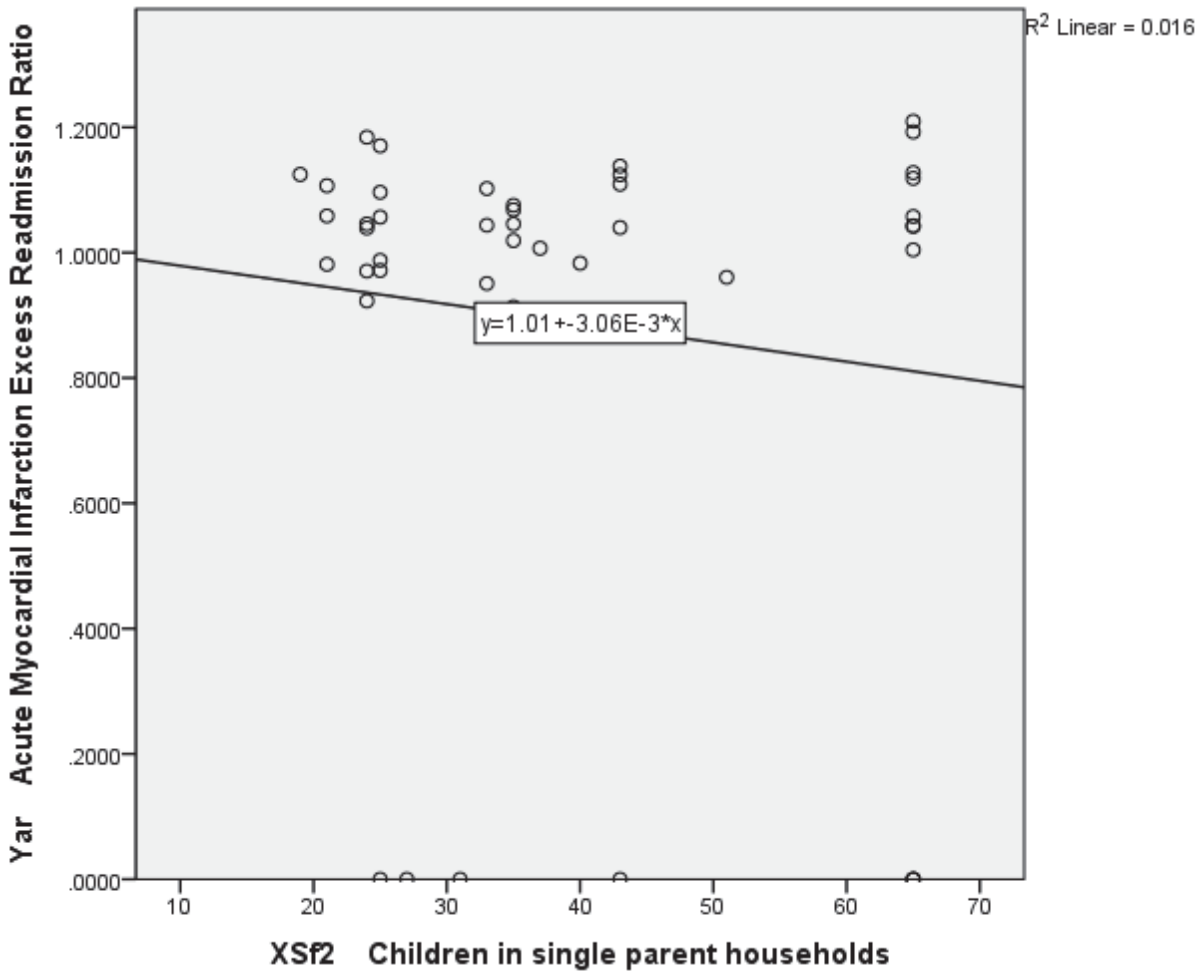
Family and Support: Emotional support

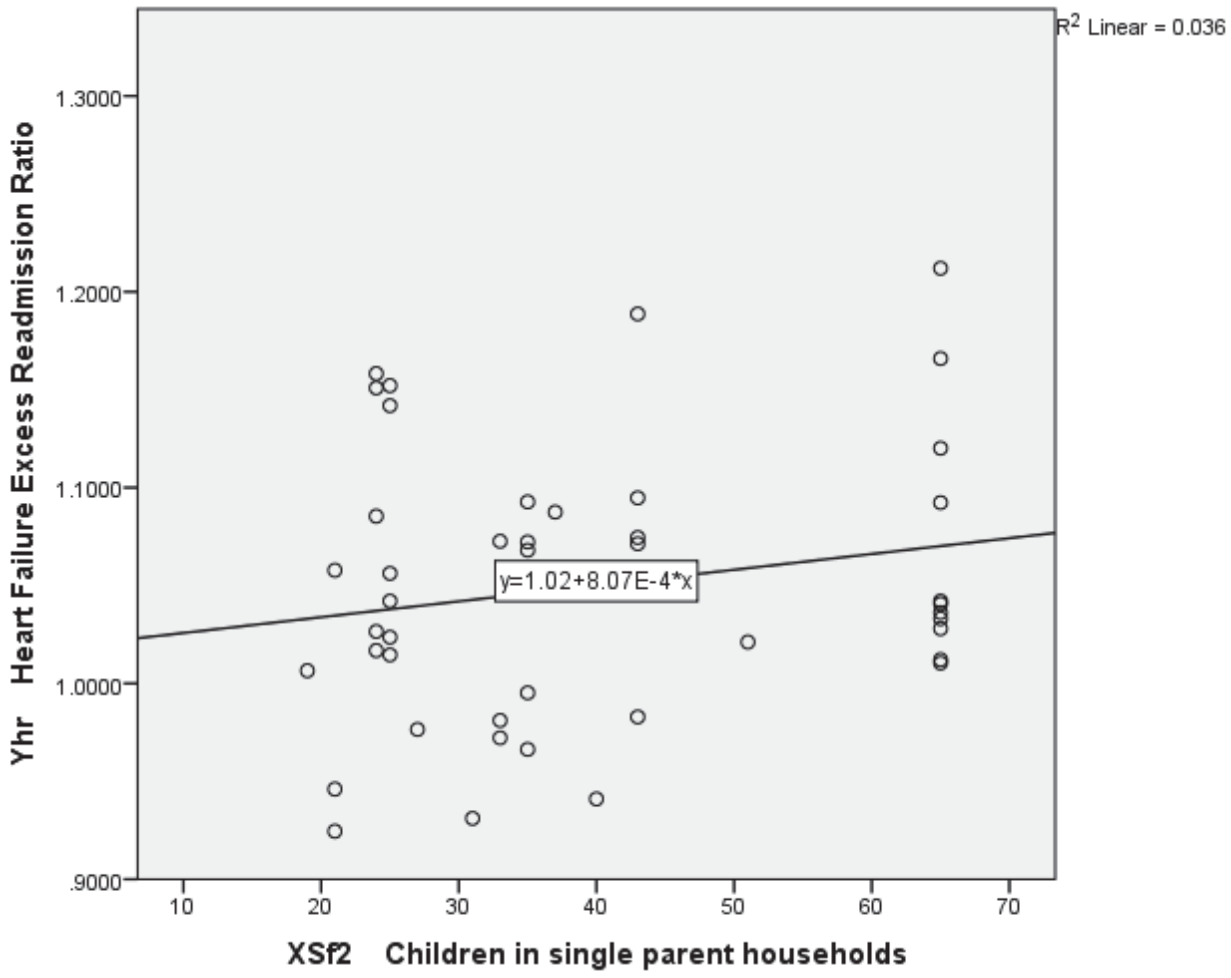


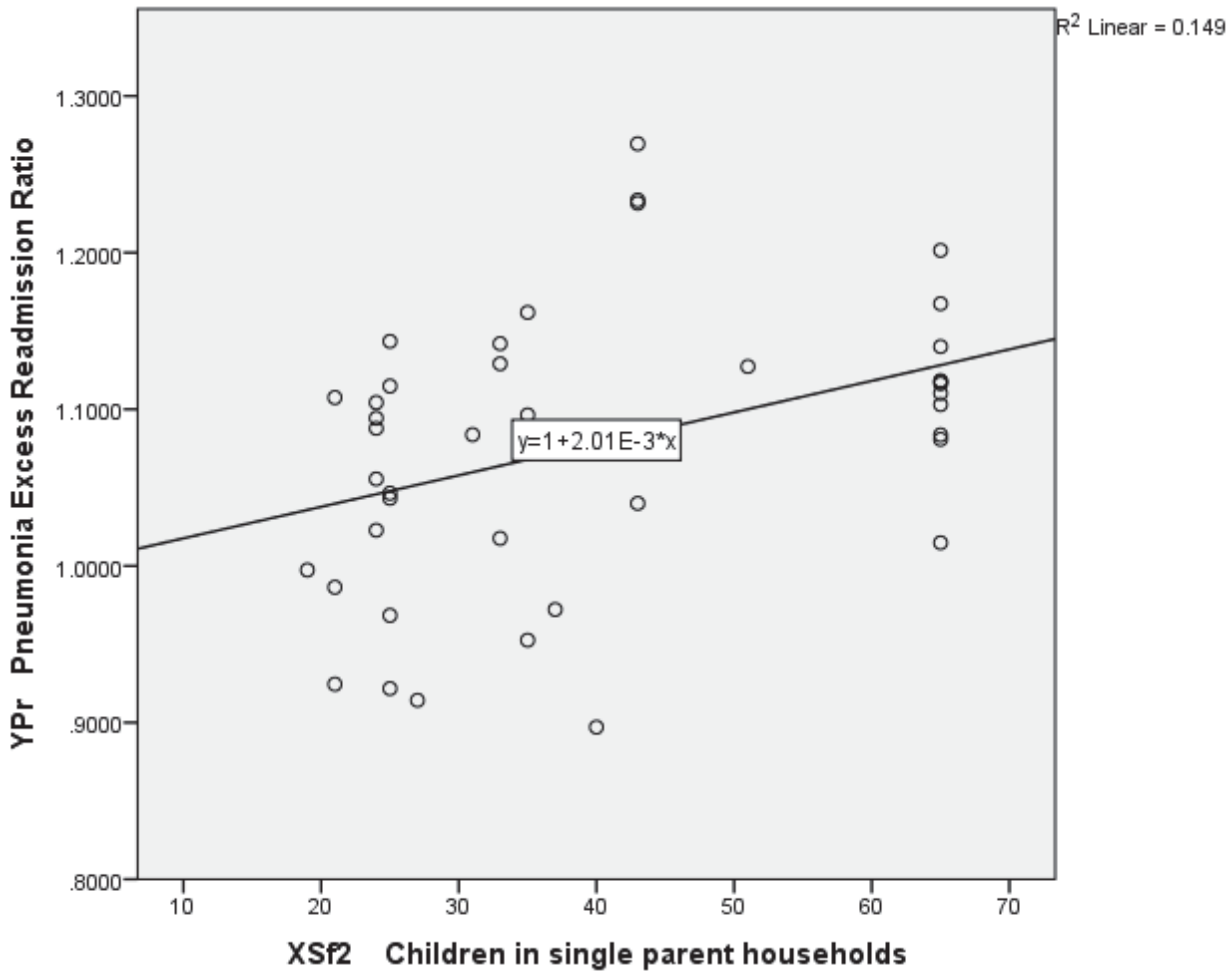

R2 Linear = 0.075
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=0.96+4E-3*x
16
18
20
22
24
26
28
30
XSf1 Emotional Support In adequate social support


R2 Linear = 0.137
y=0.93+6.66E-3*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
16
18
20
22
24
26
28
30
XSf1 Emotional Support In adequate social support

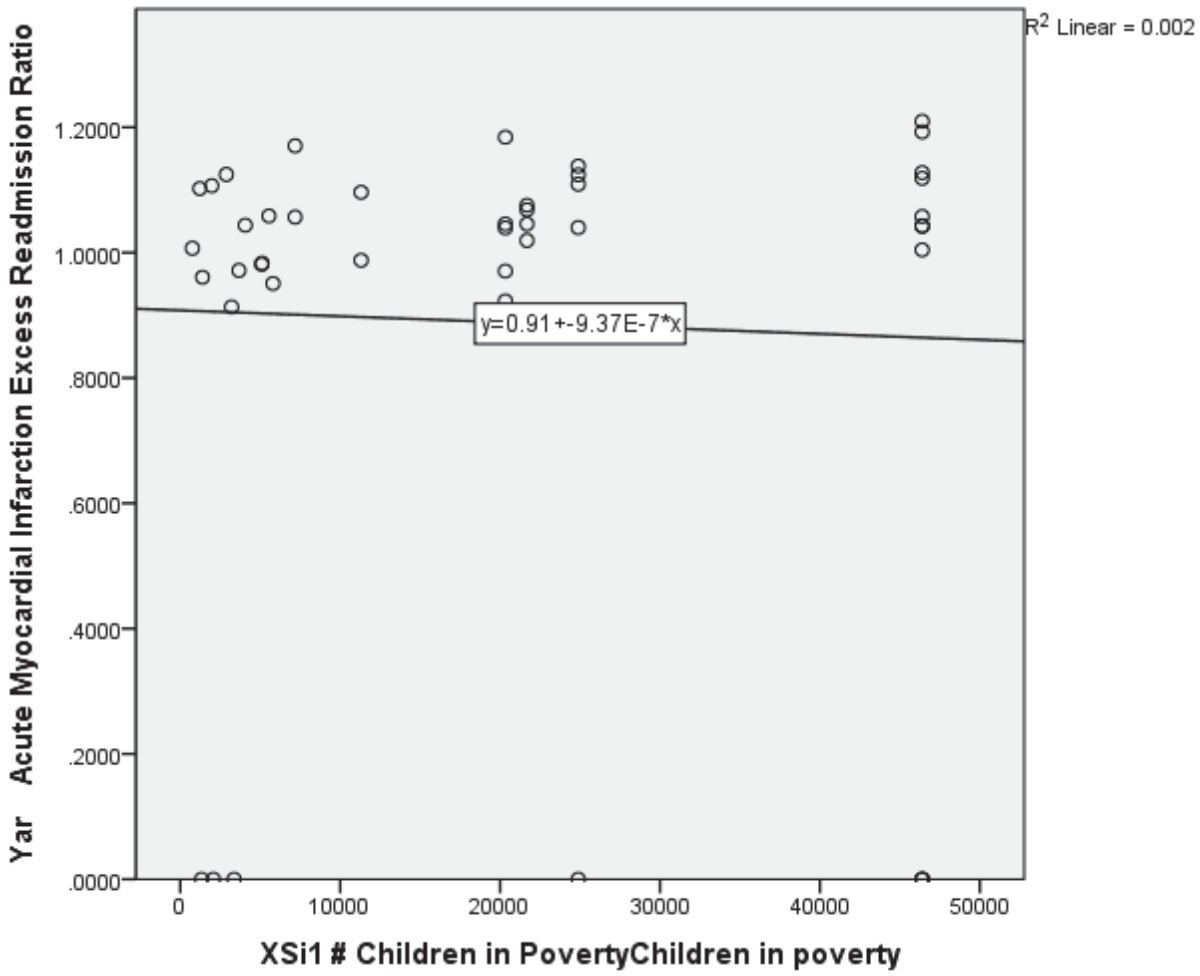
Family and Support: Children in single parent households

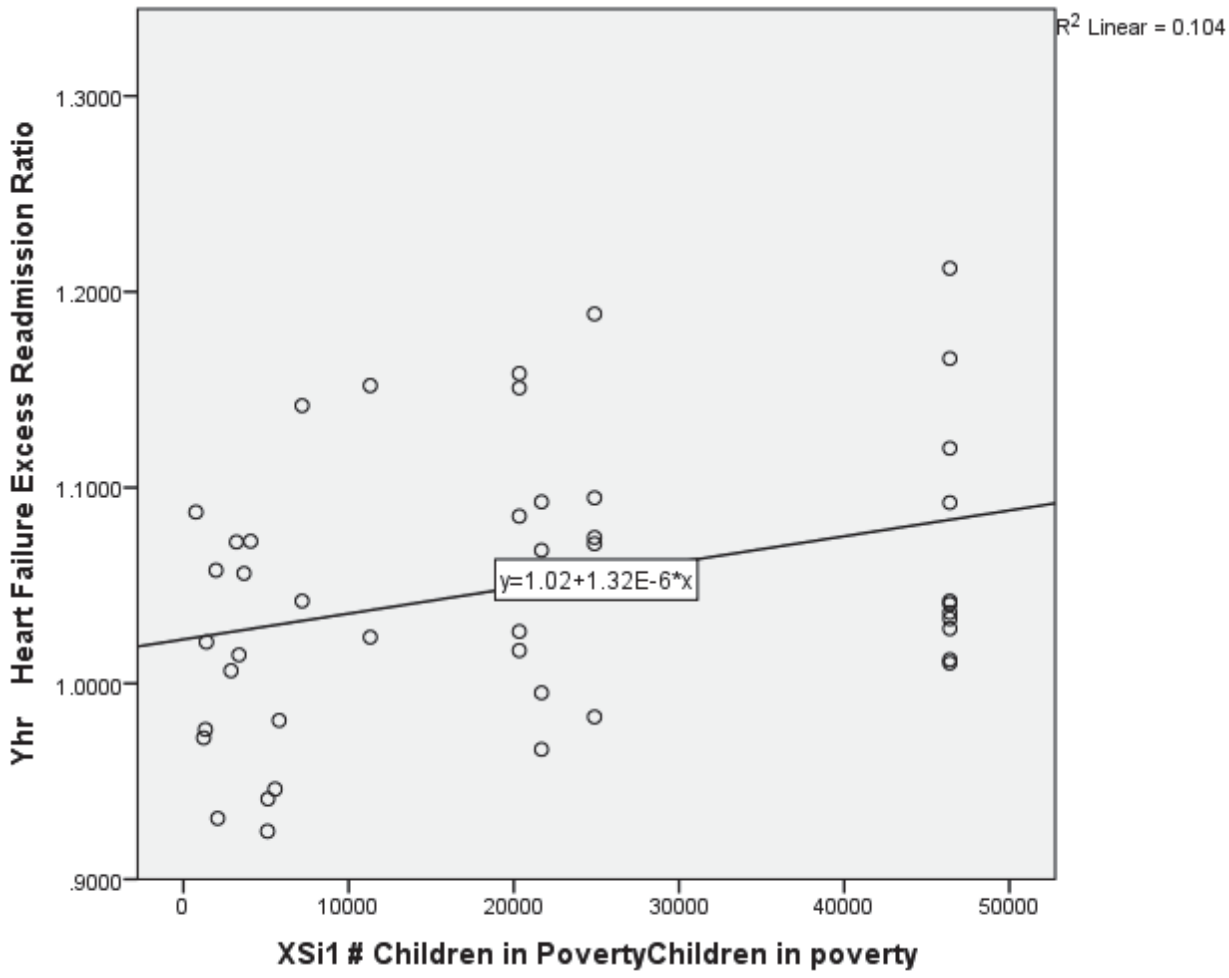


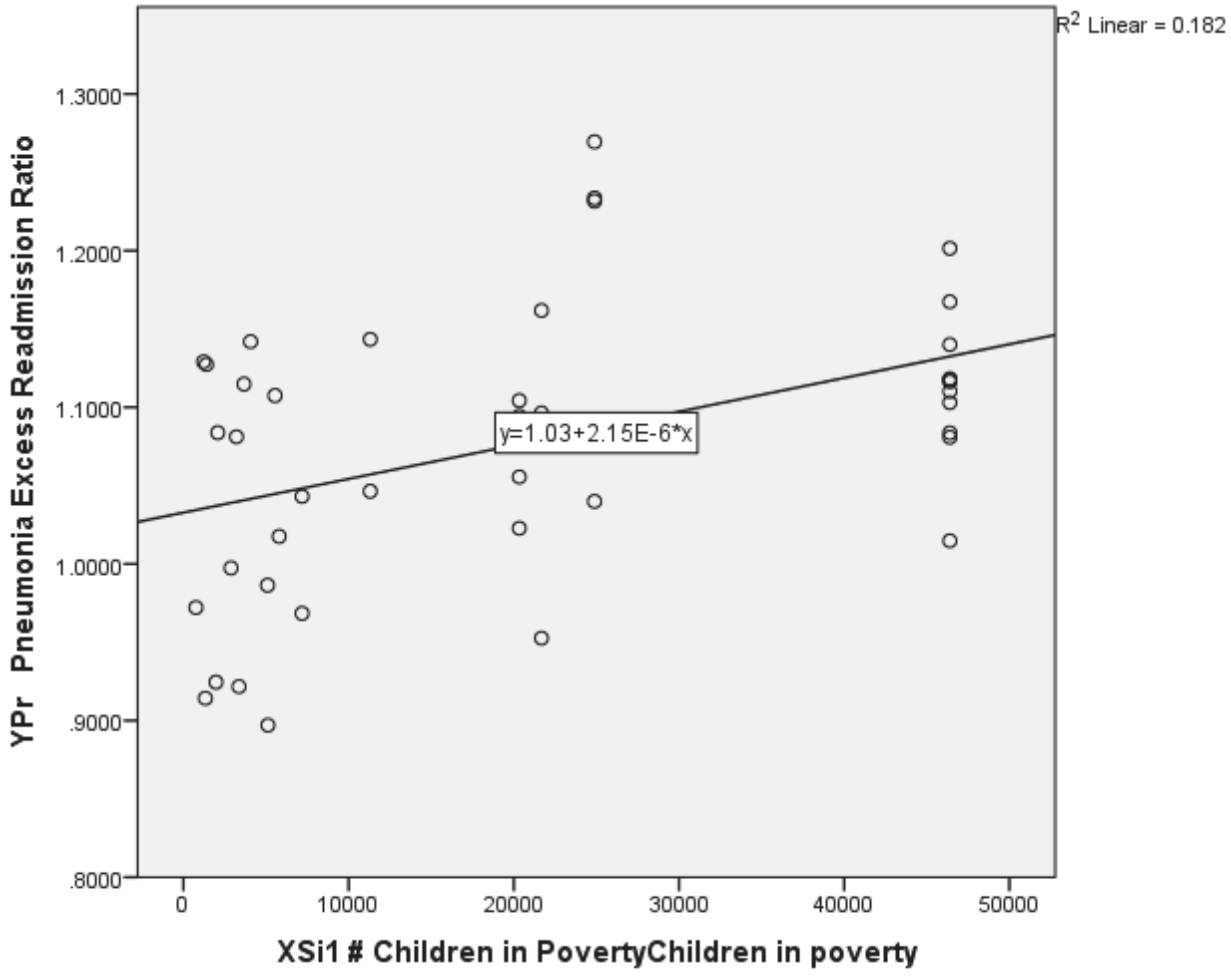

R2 Linear = 0.036
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.02+8.07E-4*x
10
20
30
40
50
60
70
XSf2 Children in single parent households


R2 Linear = 0.149
y=1+2.01E-3*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
10
20
30
40
50
60
70
XSf2 Children in single parent households

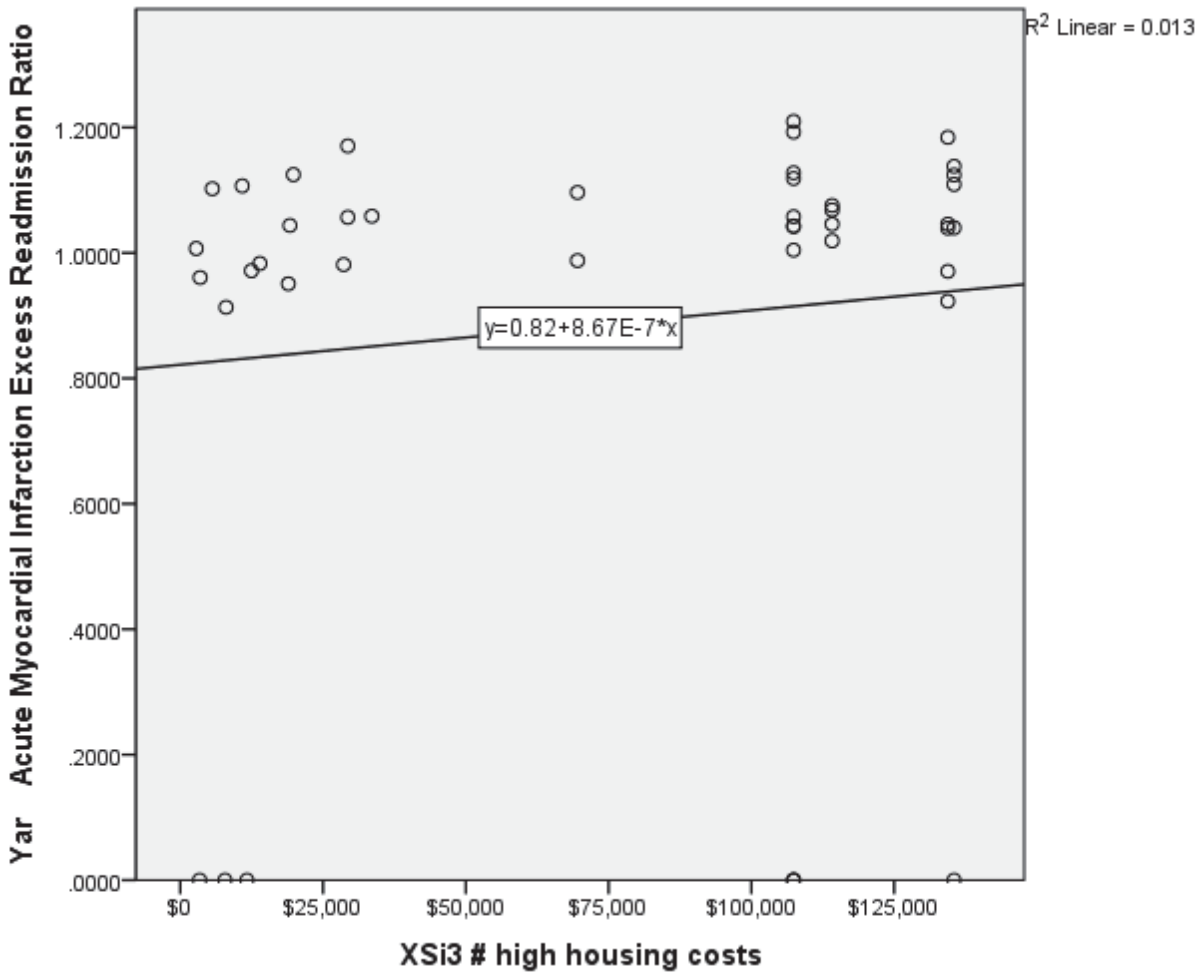
Income: Children in poverty

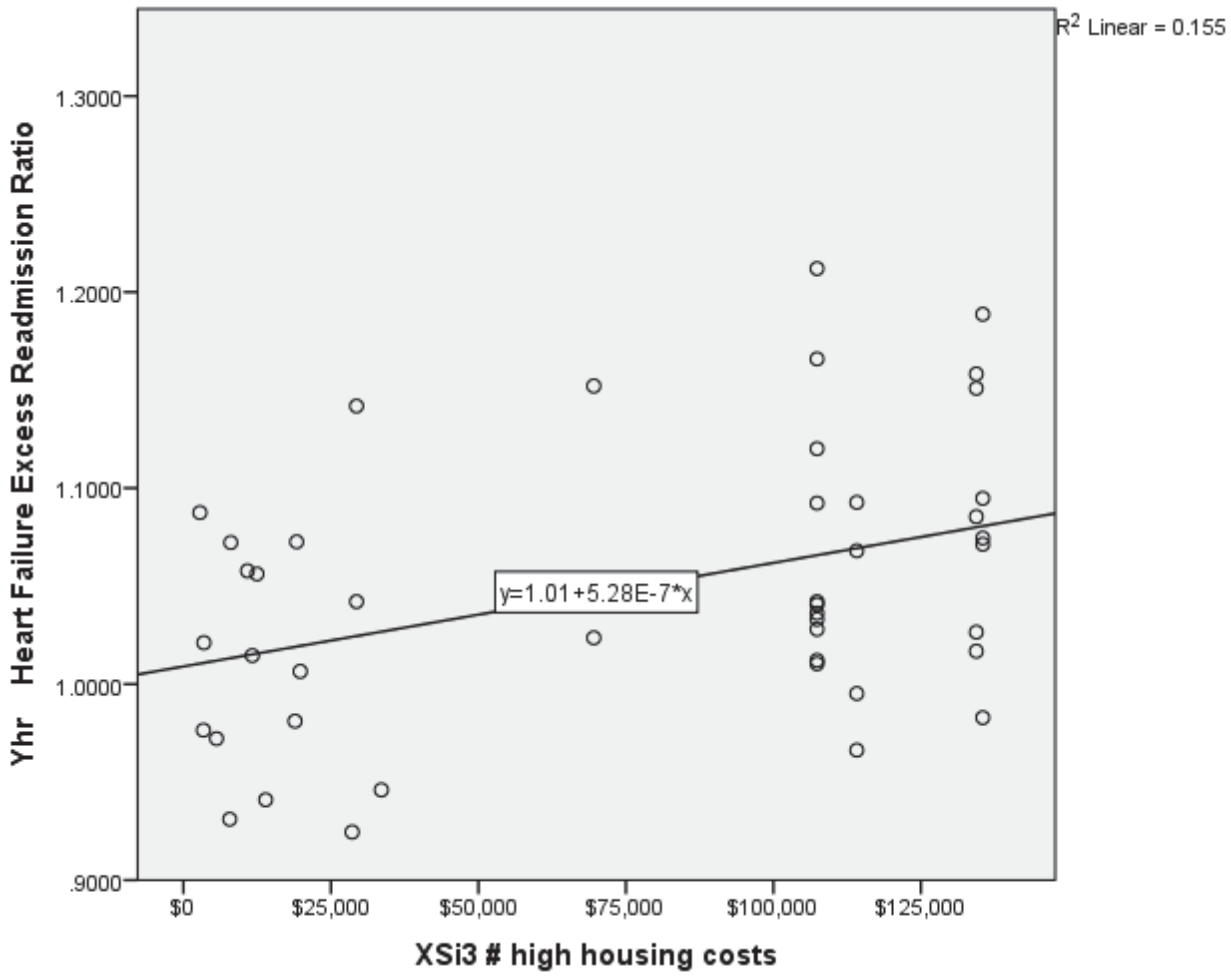


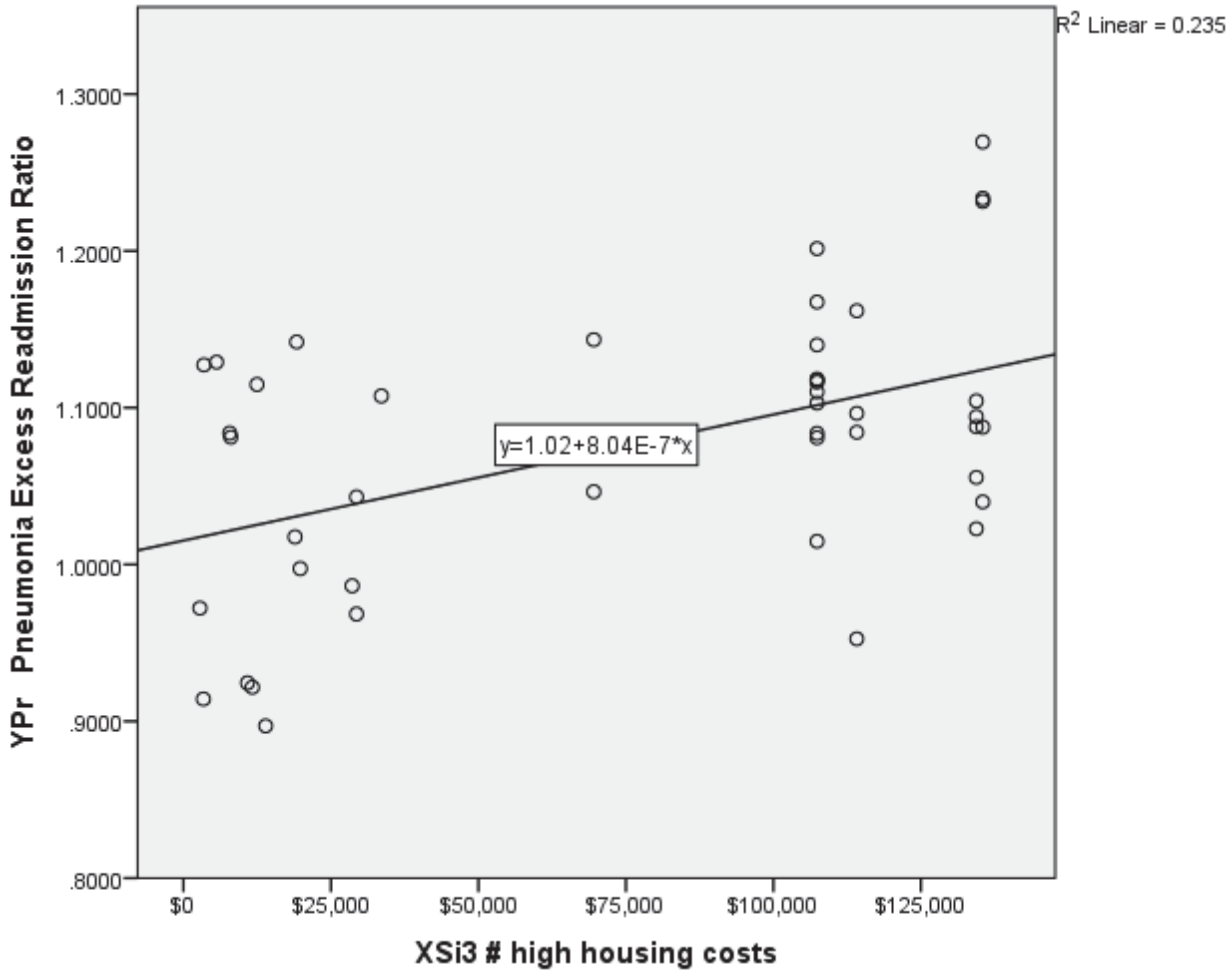

R2 Linear = 0.104
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.02+1.32E-6*x
0
10000
20000
30000
40000
50000
XSi1 # Children in PovertyChildren in poverty


R2 Linear = 0.182
y=1.03+2.15E-6*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
0
10000
20000
30000
40000
50000
XSi1 # Children in PovertyChildren in poverty

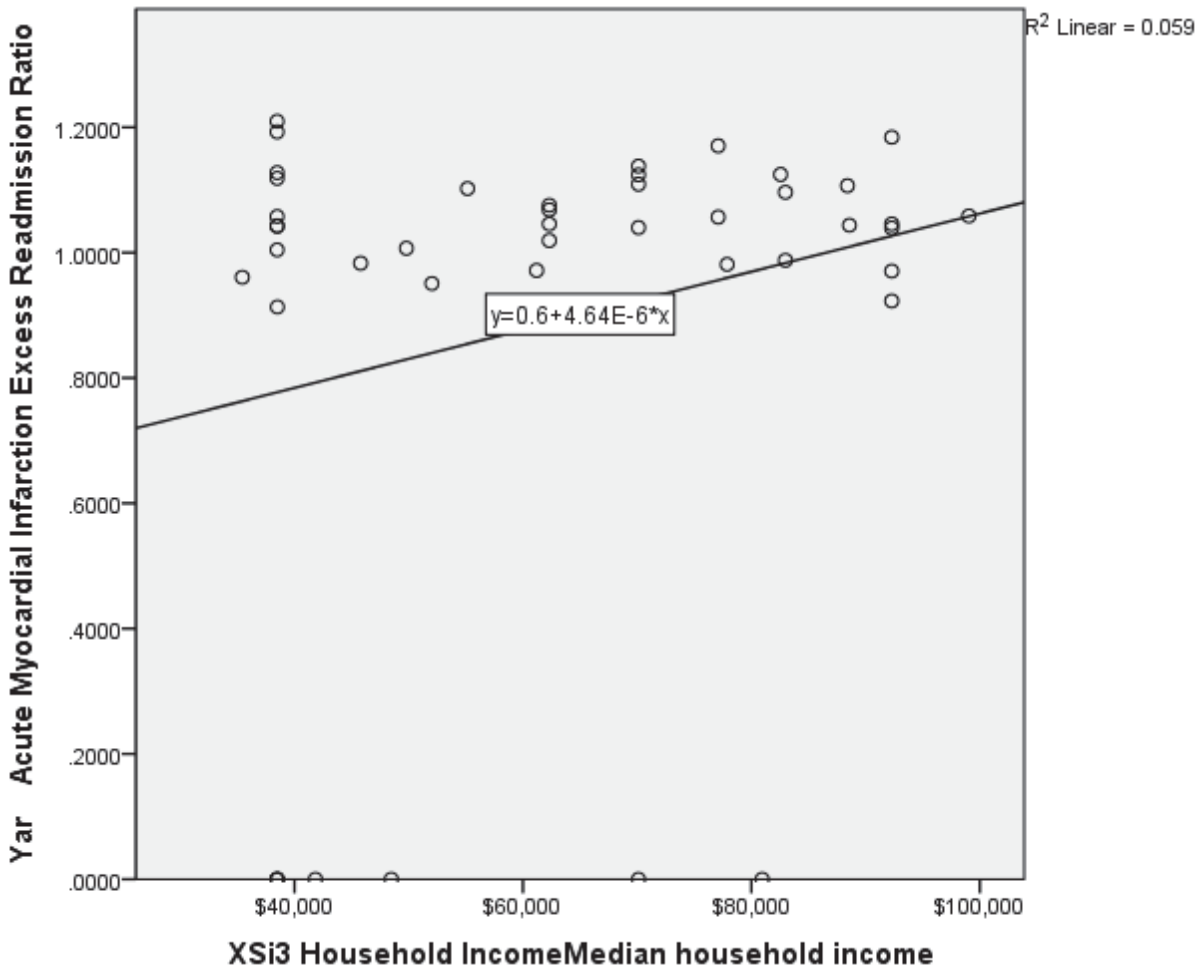
Income: High Housing Costs

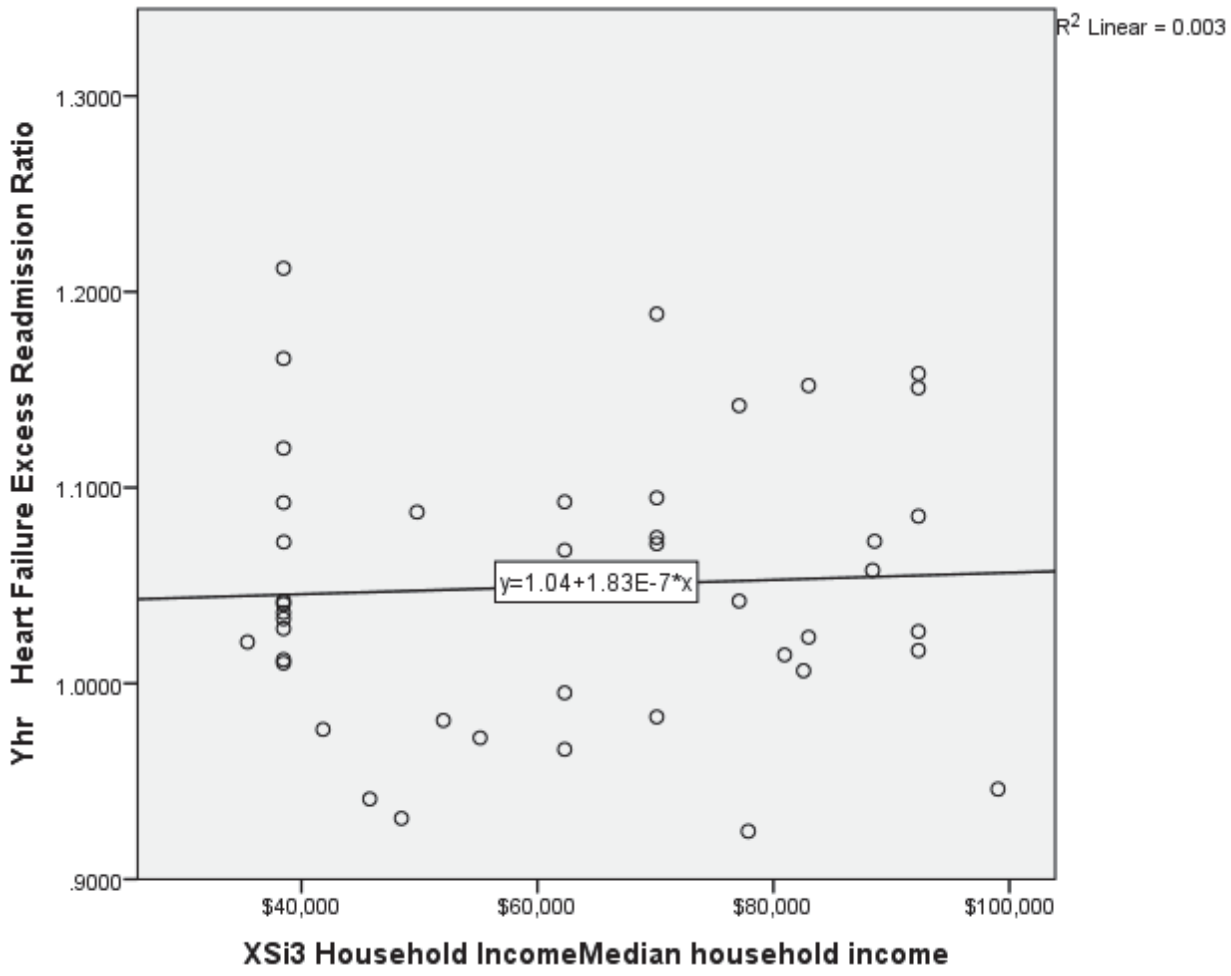


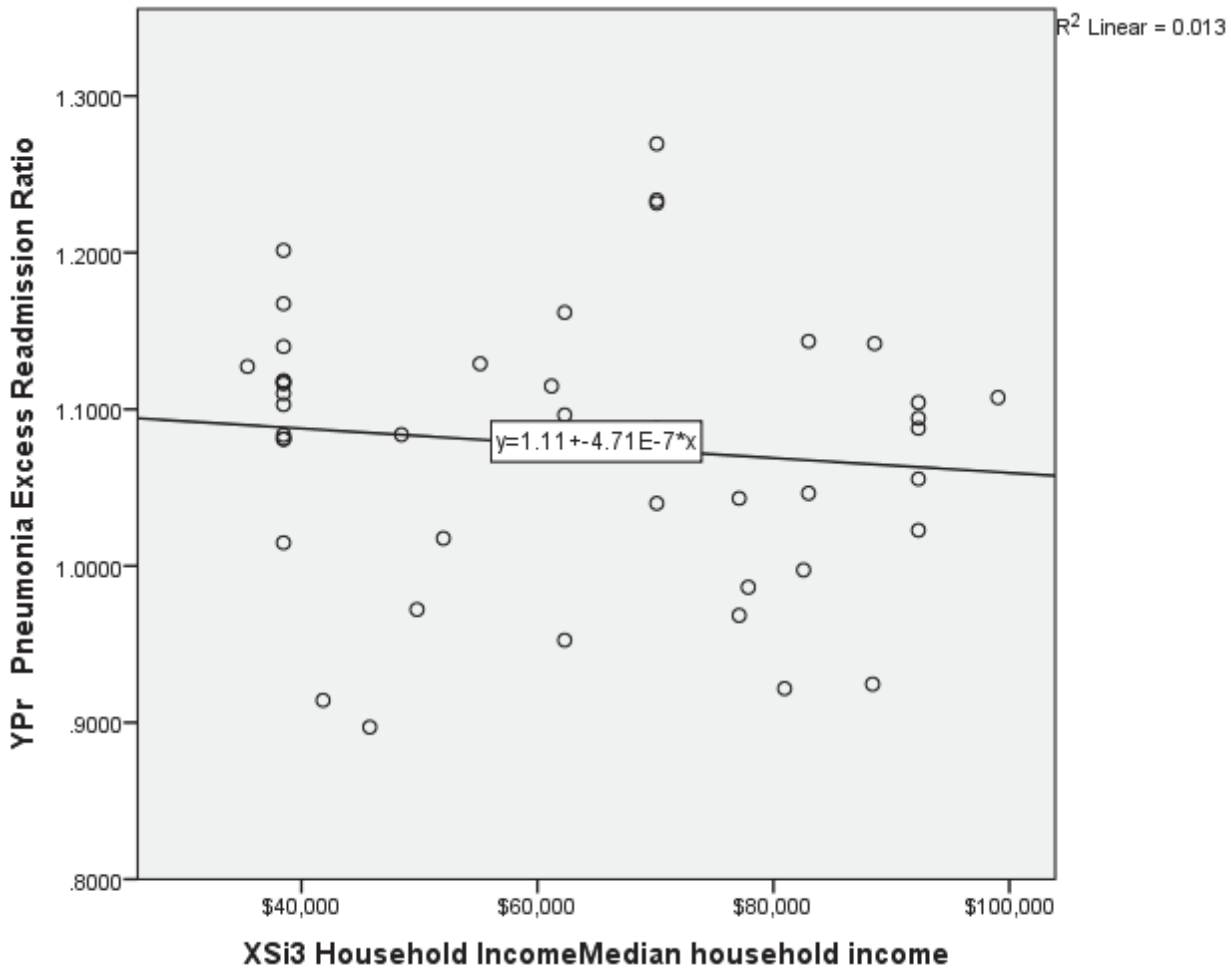

R2 Linear = 0.155
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.01+5.28E-7*x
$0
$25,000
$50,000
$75,000
$100,000
$125,000
XSi3 # high housing costs


R2 Linear = 0.235
y=1.02+8.04E-7*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
$0
$25,000
$50,000
$75,000
$100,000
$125,000
XSi3 # high housing costs

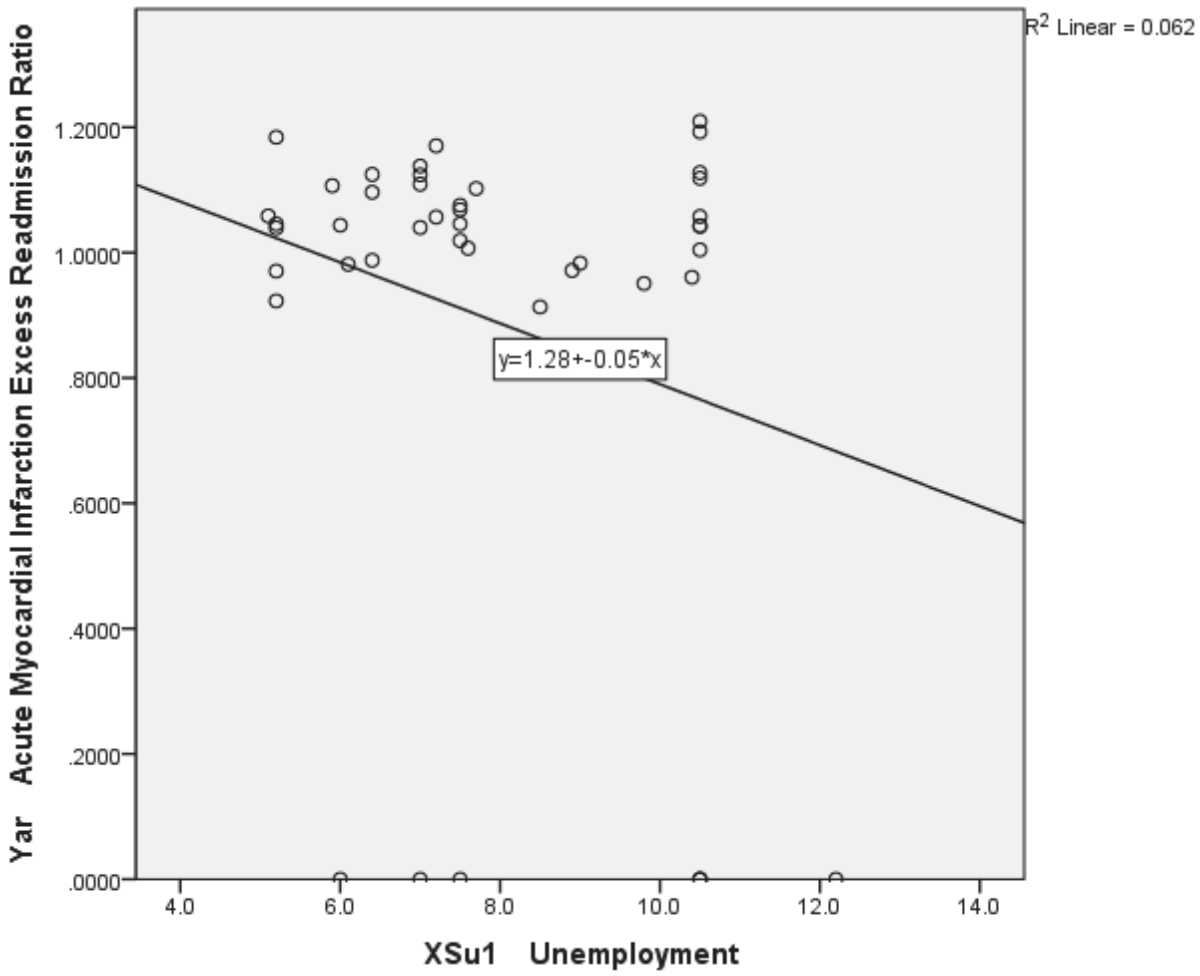
Income: Household Income

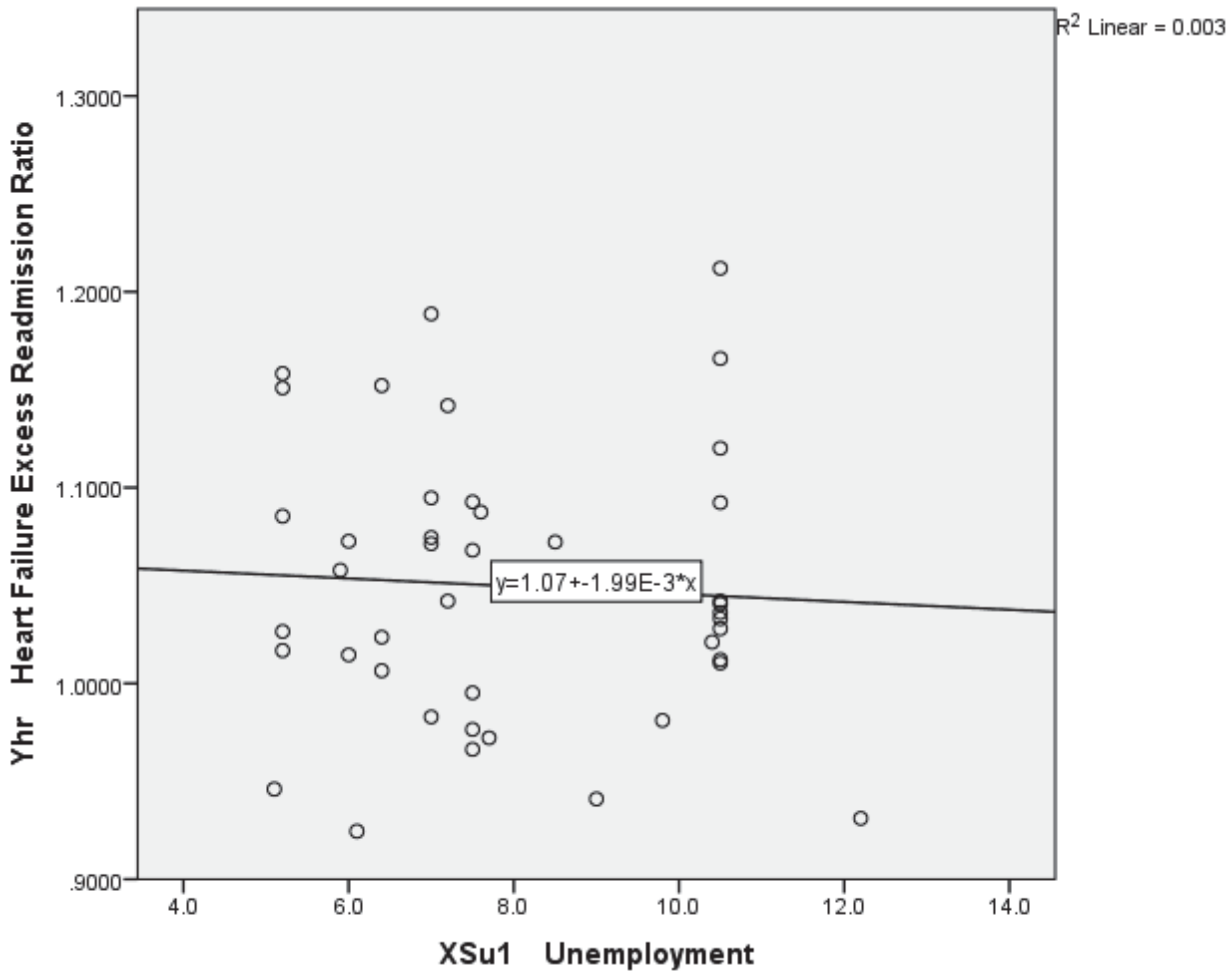


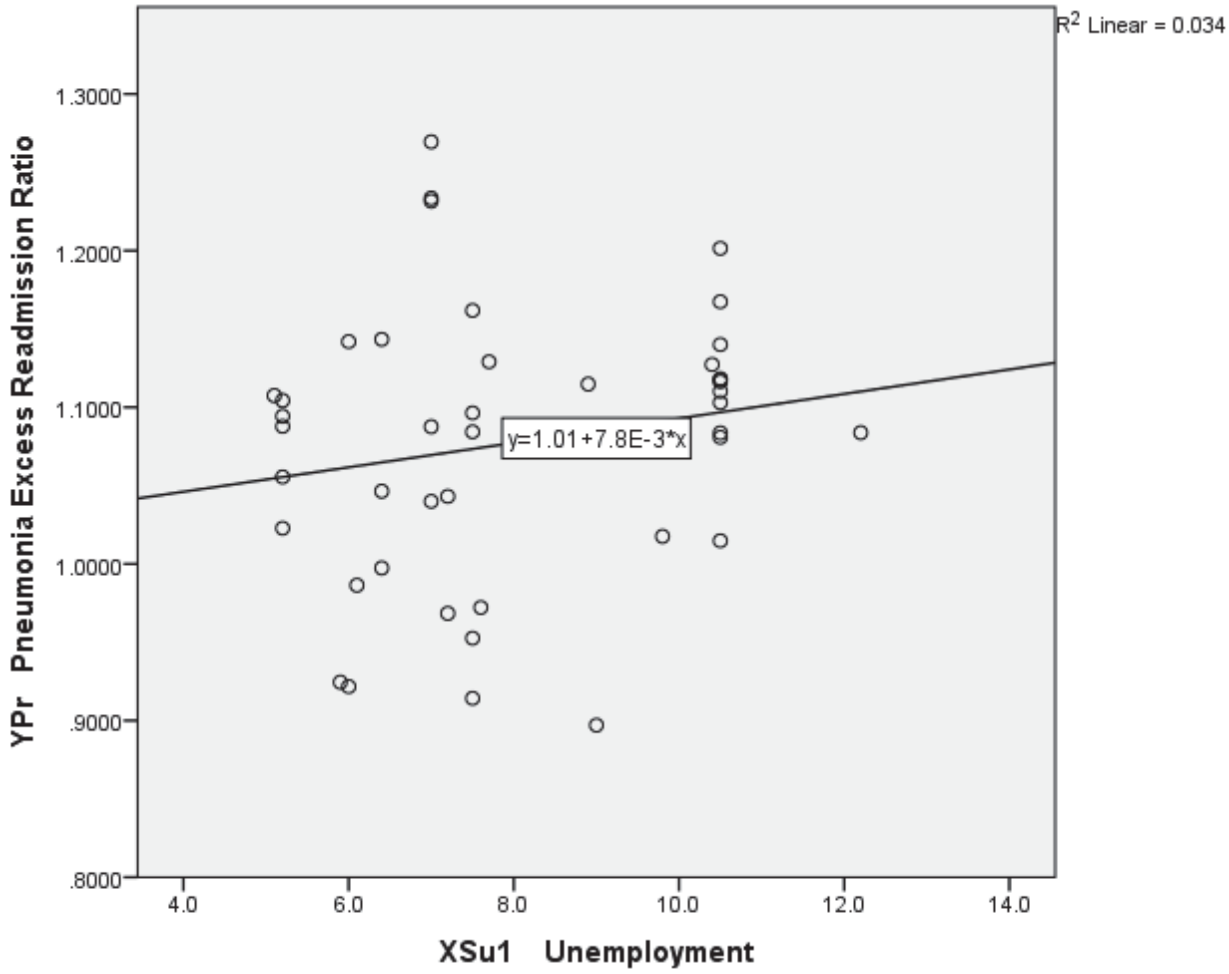

R2 Linear = 0.003
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.04+1.83E-7*x
$40,000
$60,000
$80,000
$100,000
XSi3 Household IncomeMedian household income


R2 Linear = 0.013
y=1.11+-4.71E-7*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
$40,000
$60,000
$80,000
$100,000
XSi3 Household IncomeMedian household income

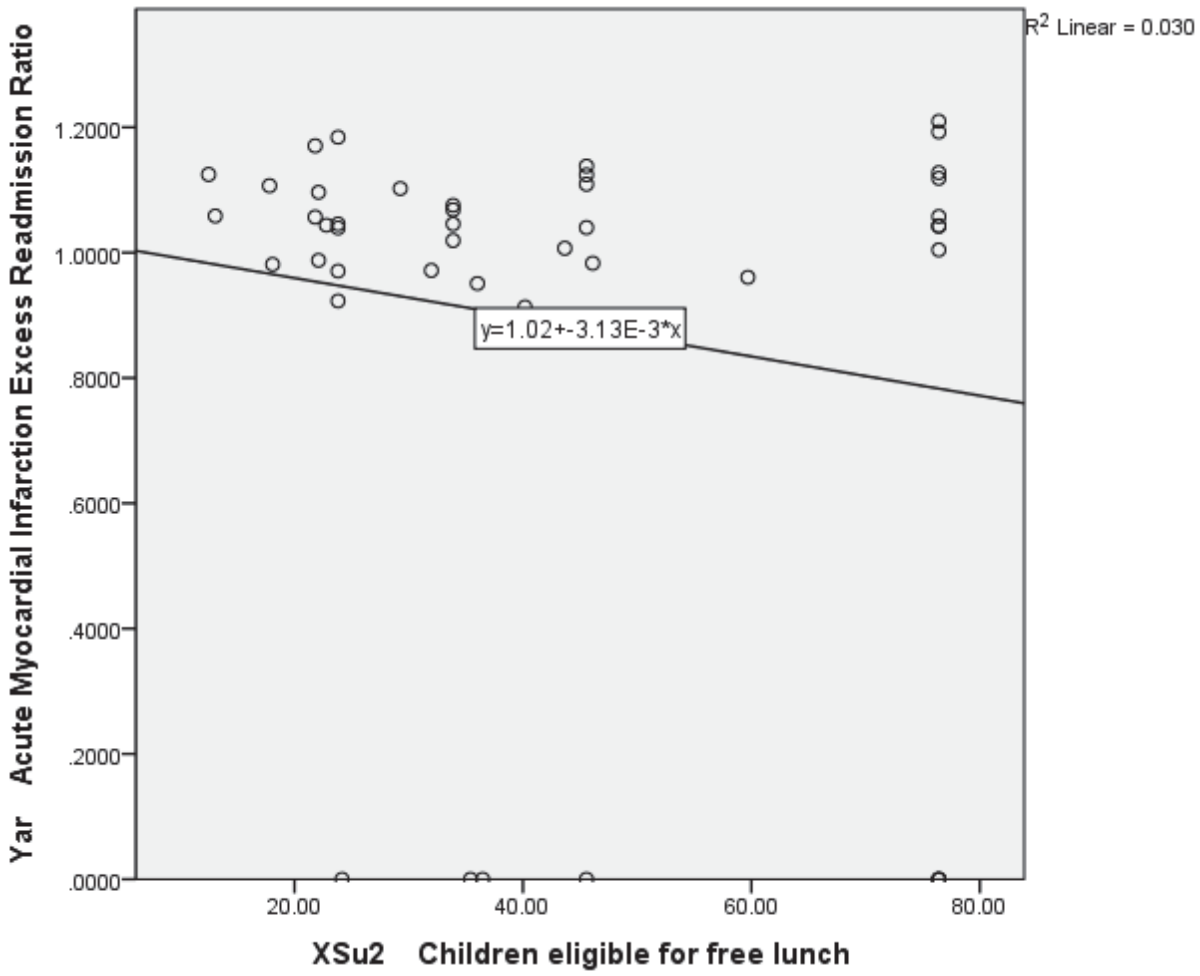
Employment: Unemployment

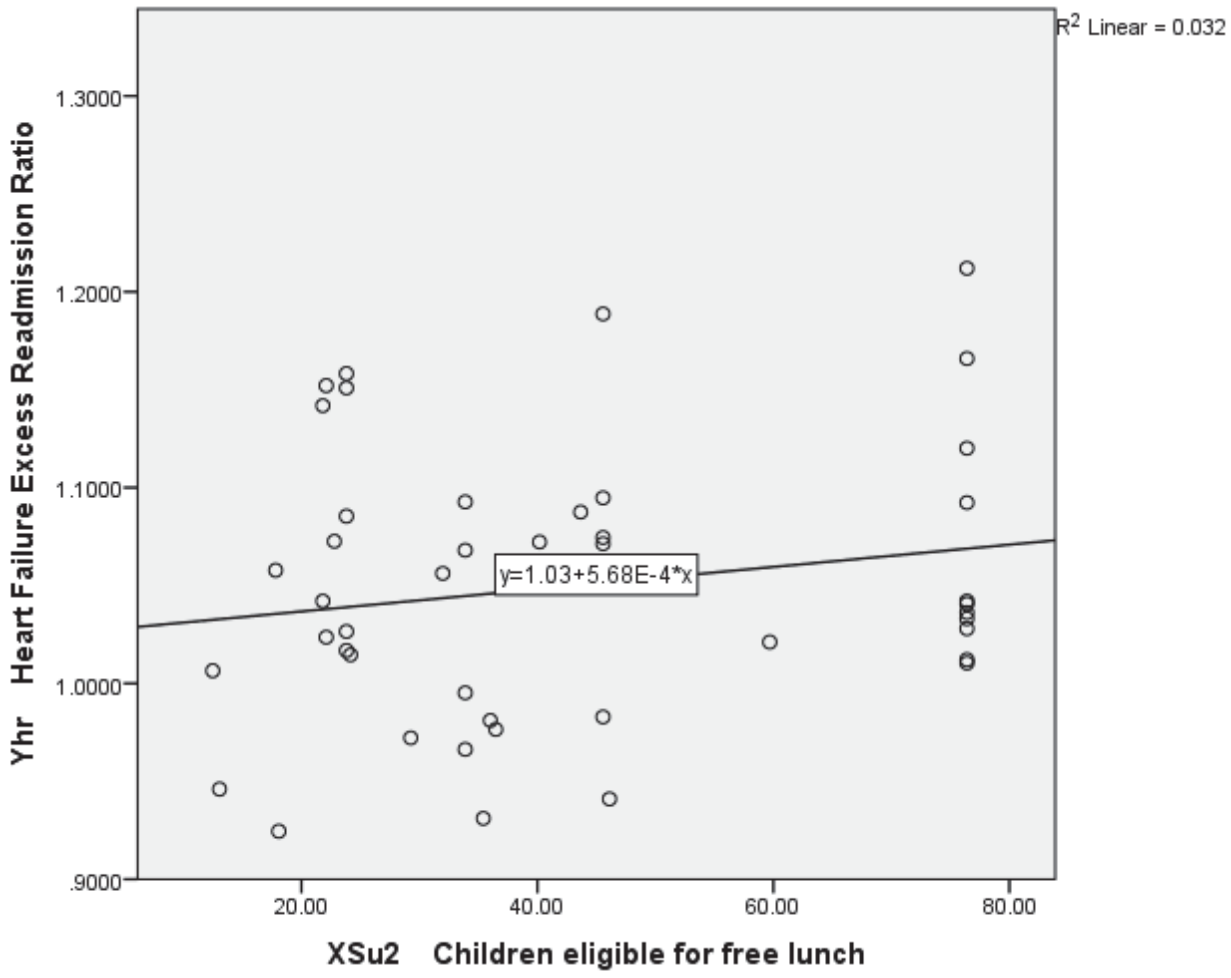


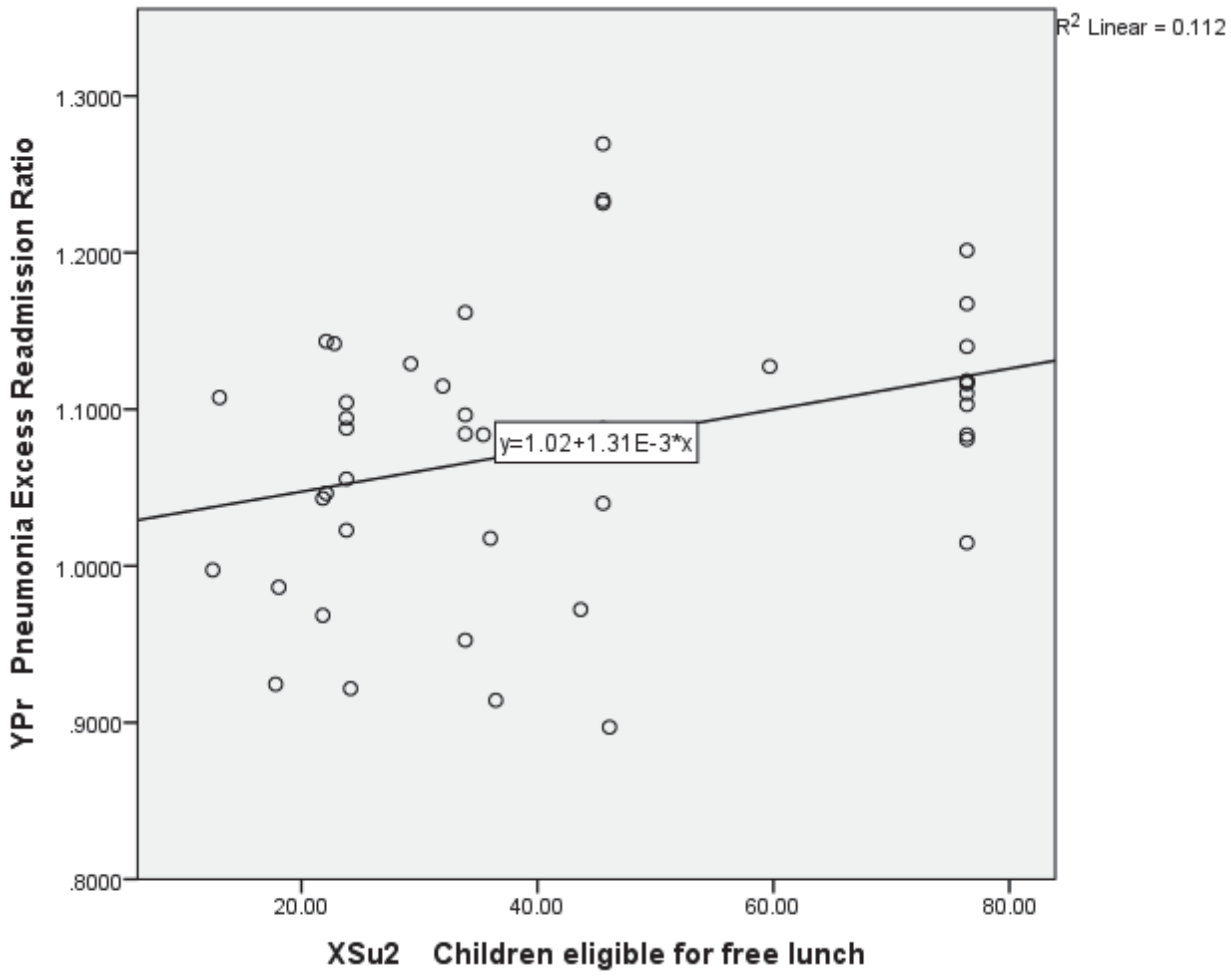

R2 Linear = 0.003
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.07+-1.99E-3*x
4.0
6.0
8.0
10.0
12.0
14.0
XSu1 Unemployment


R2 Linear = 0.034
y=1.01+7.8E-3*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
4.0
6.0
8.0
10.0
12.0
14.0
XSu1 Unemployment

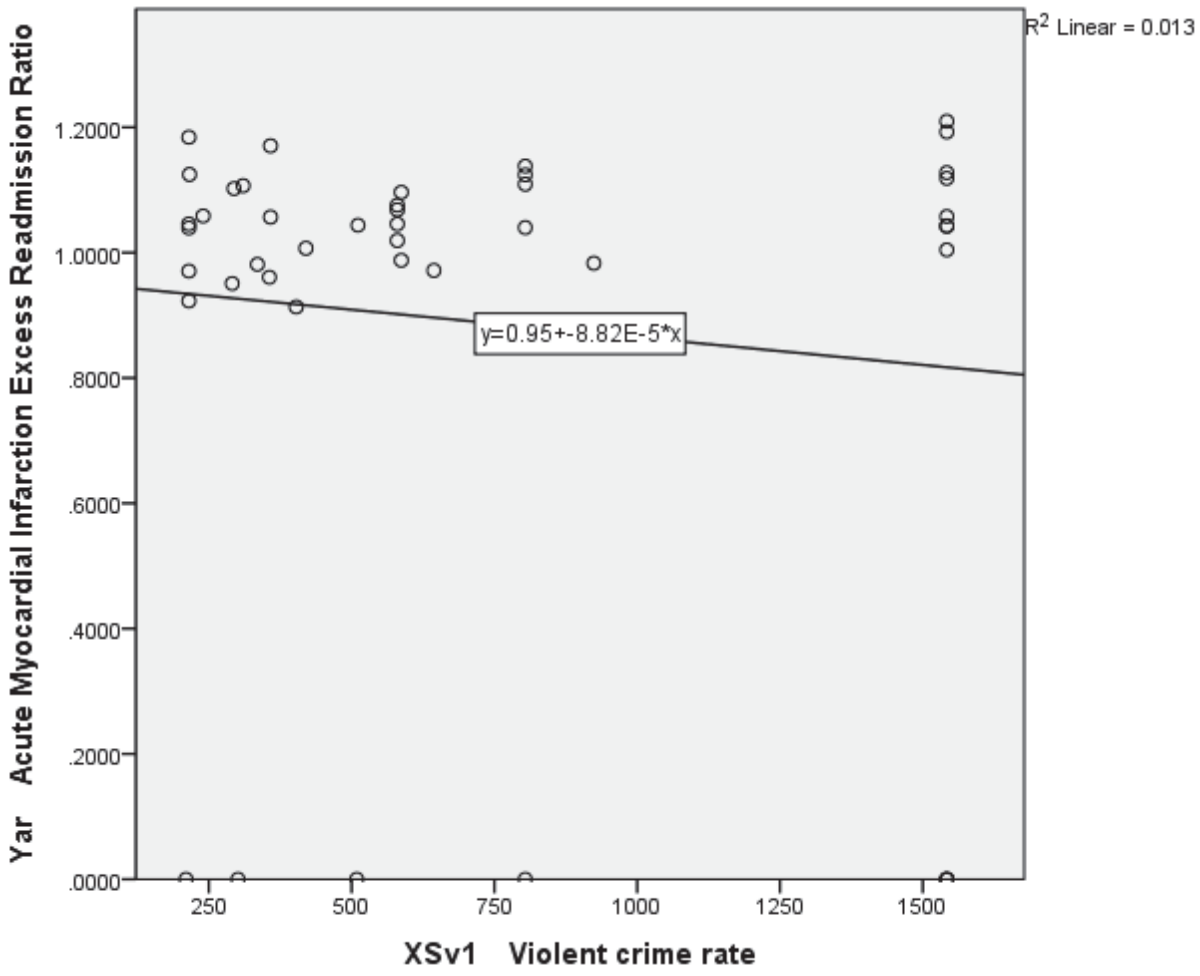
Employment: Children eligible for free lunch

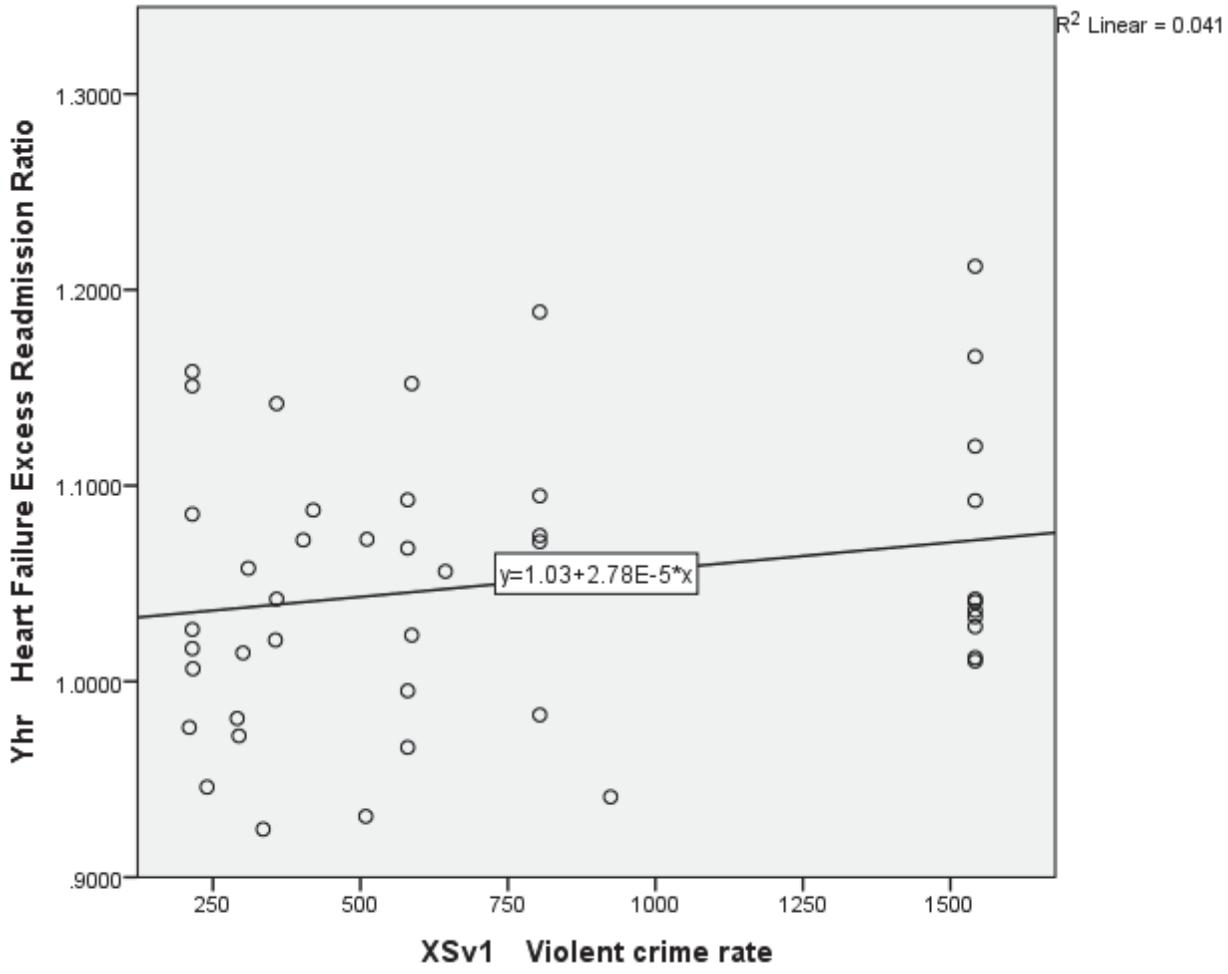


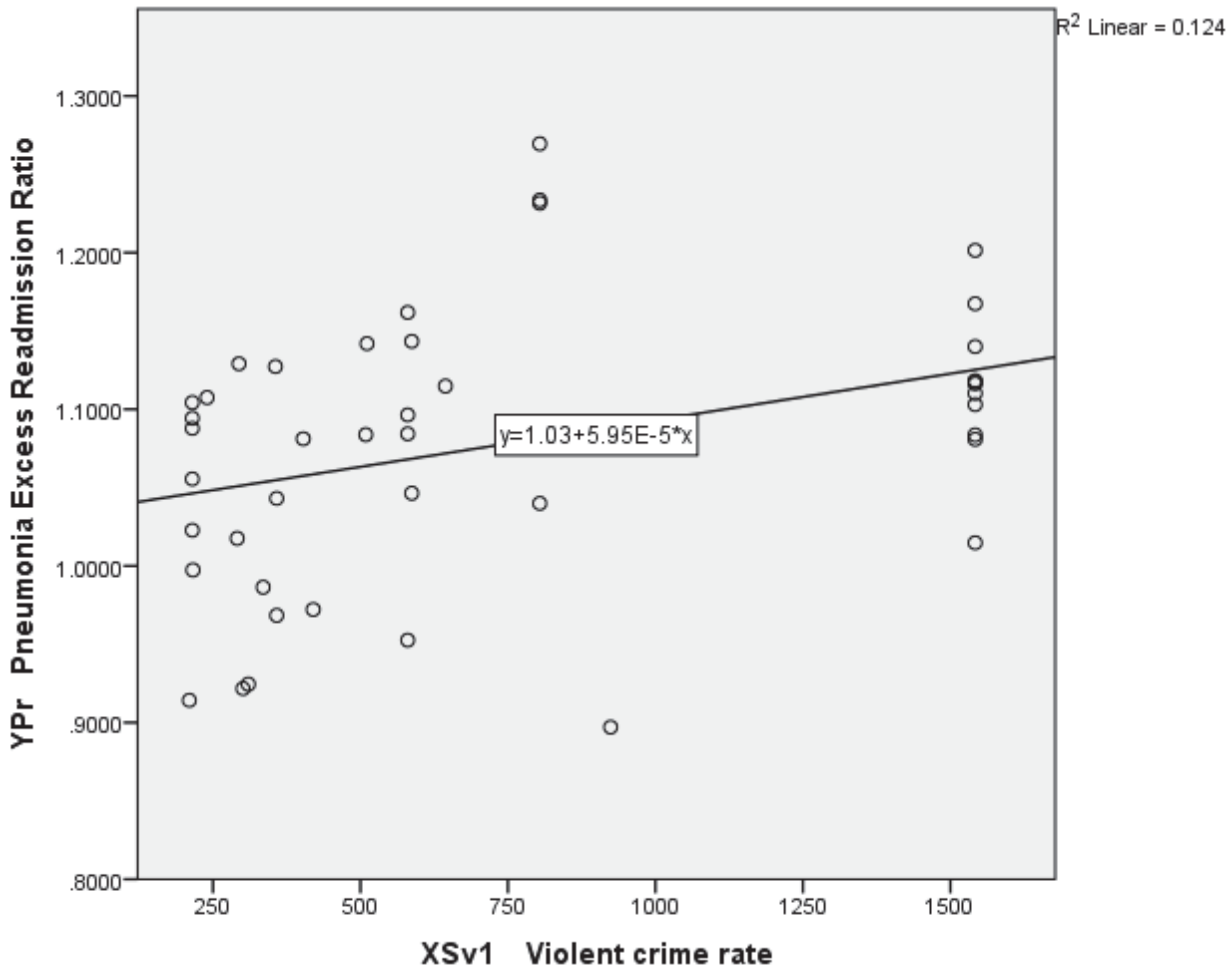

R2 Linear = 0.032
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.03+5.68E-4*x
20.00
40.00
60.00
80.00
XSu2 Children eligible for free lunch


R2 Linear = 0.112
y=1.02+1.31E-3*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
20.00
40.00
60.00
80.00
XSu2 Children eligible for free lunch

Community Safety: Violet Crime Rate

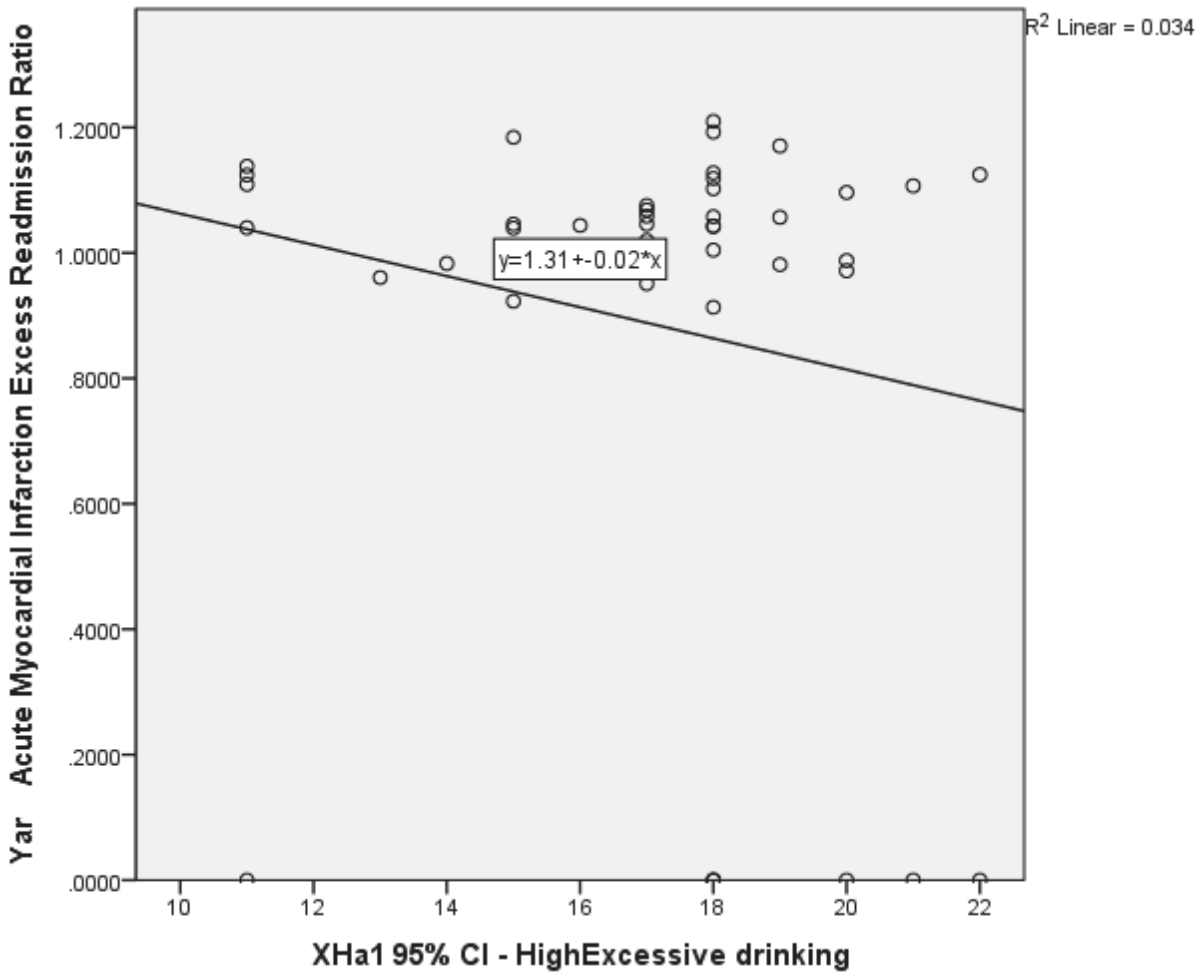


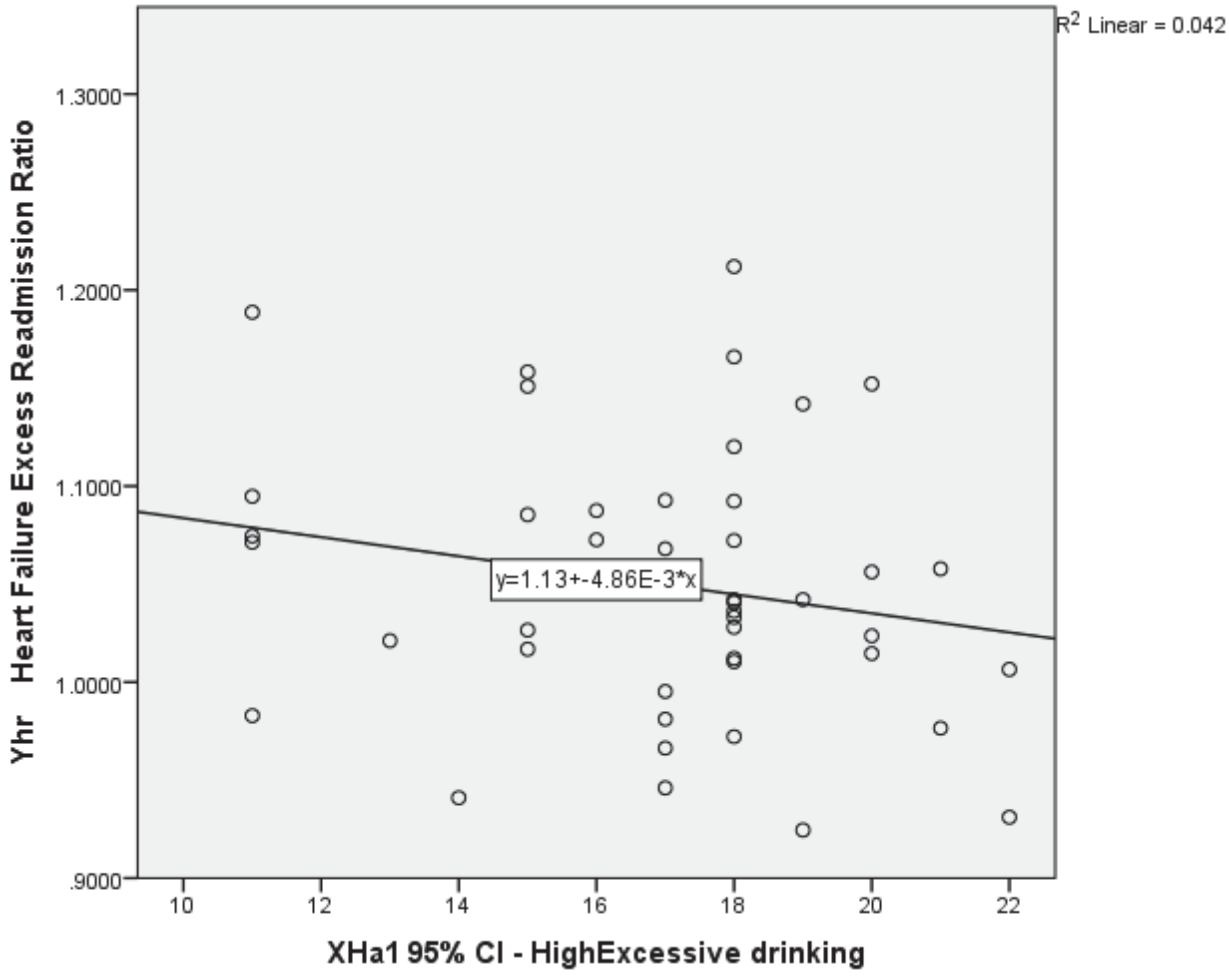

R2 Linear = 0.041
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.03+2.78E-5*x
250
500
750
1000
1250
1500
XSv1 Violent crime rate

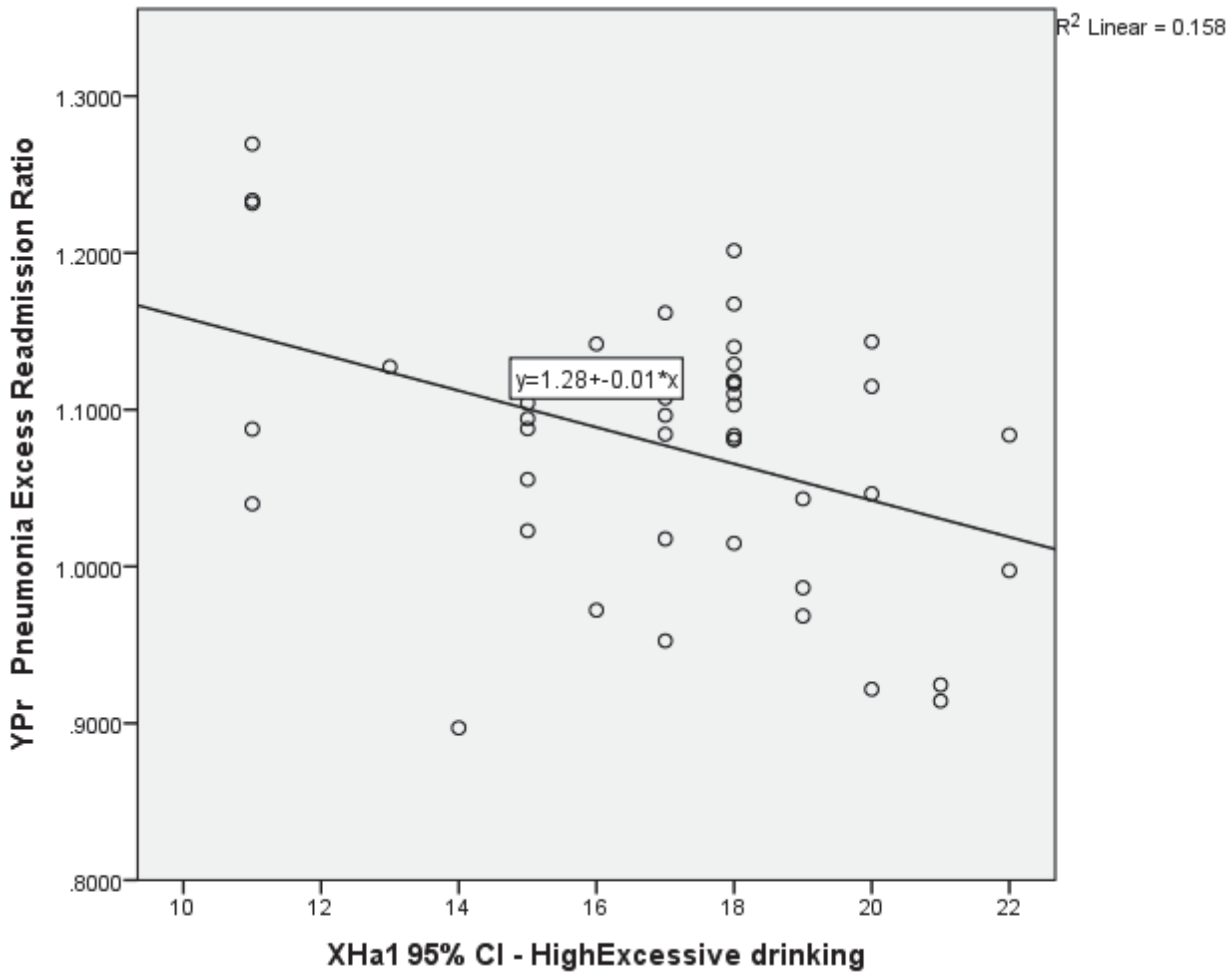

R2 Linear = 0.124
y=1.03+5.95E-5*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
250
500
750
1000
1250
1500
XSv1 Violent crime rate

Appendix I: Health Behaviors Plots

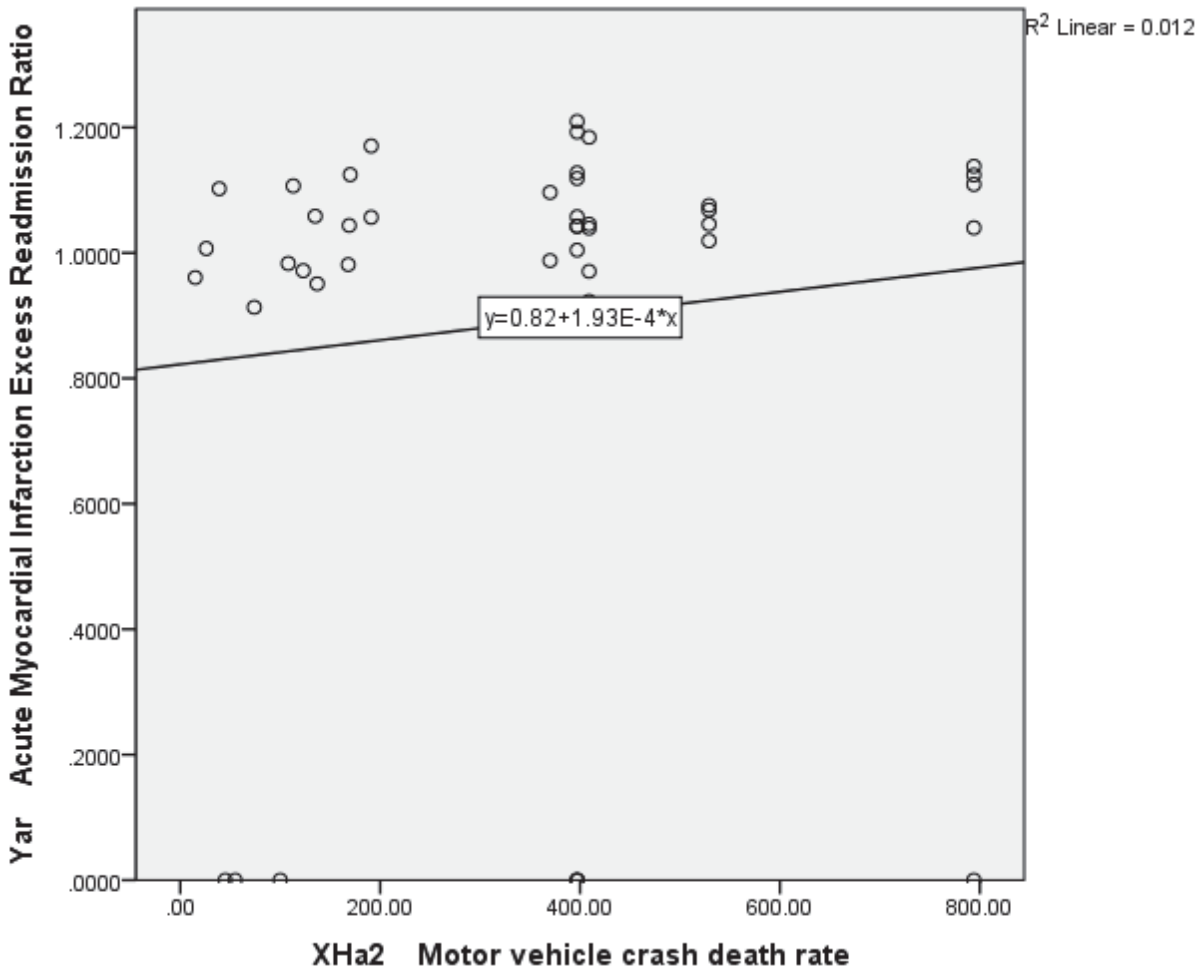
Alcohol Use: Excessive Drinking

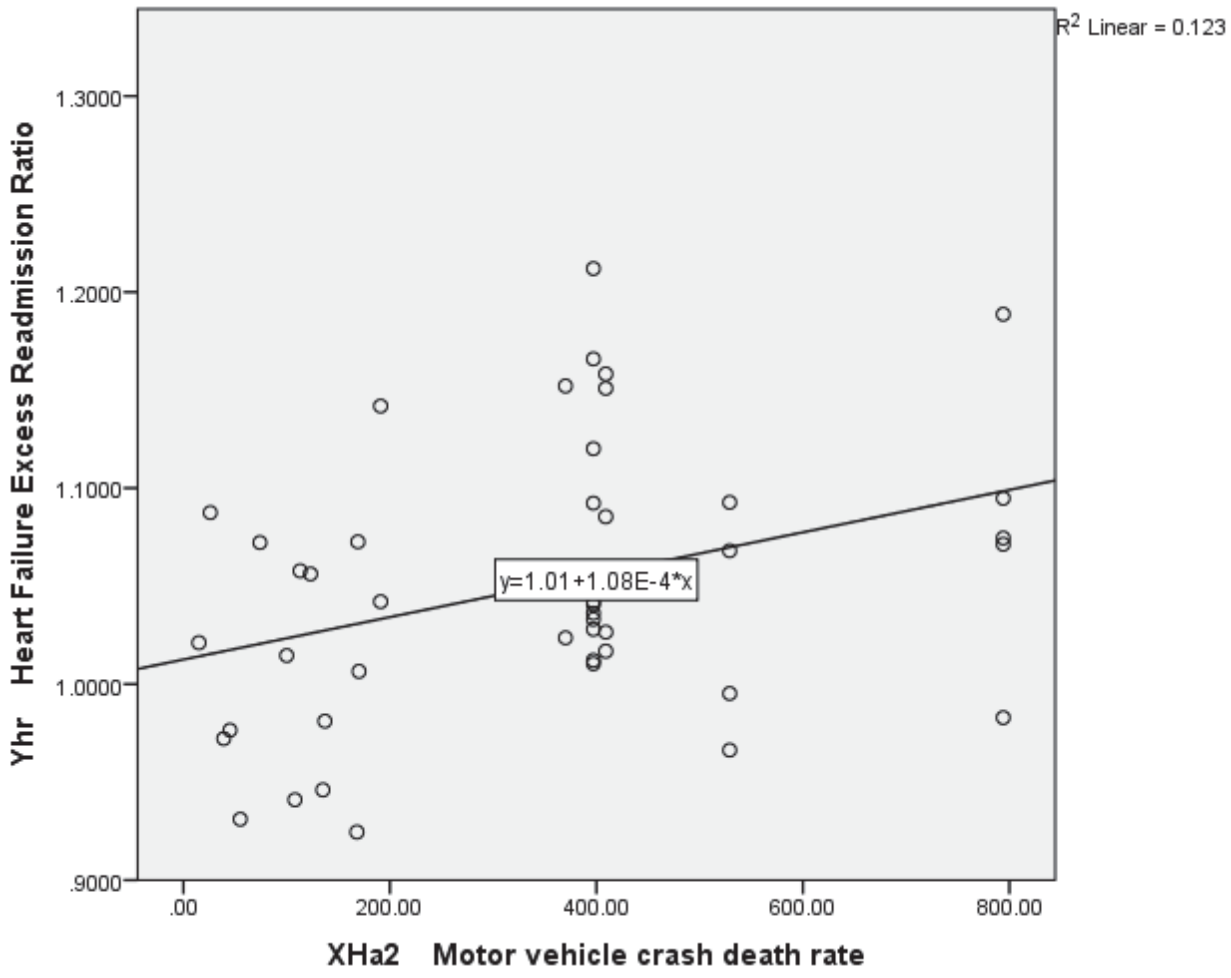


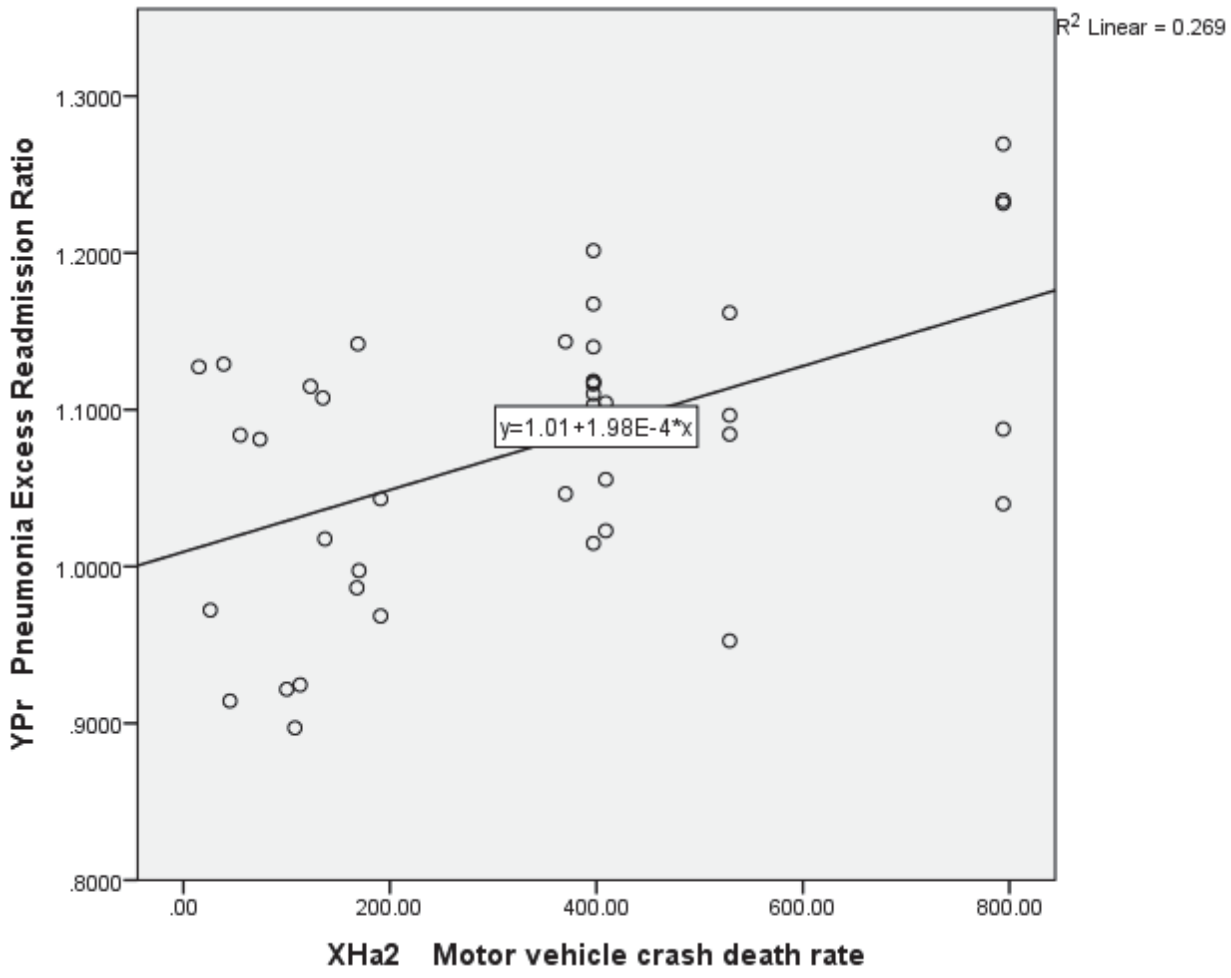

R2 Linear = 0.042
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.13+-4.86E-3*x
10
12
14
16
18
20
22
XHa1 95% CI - HighExcessive drinking


R2 Linear = 0.158
y=1.28+-0.01*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
10
12
14
16
18
20
22
XHa1 95% CI - HighExcessive drinking

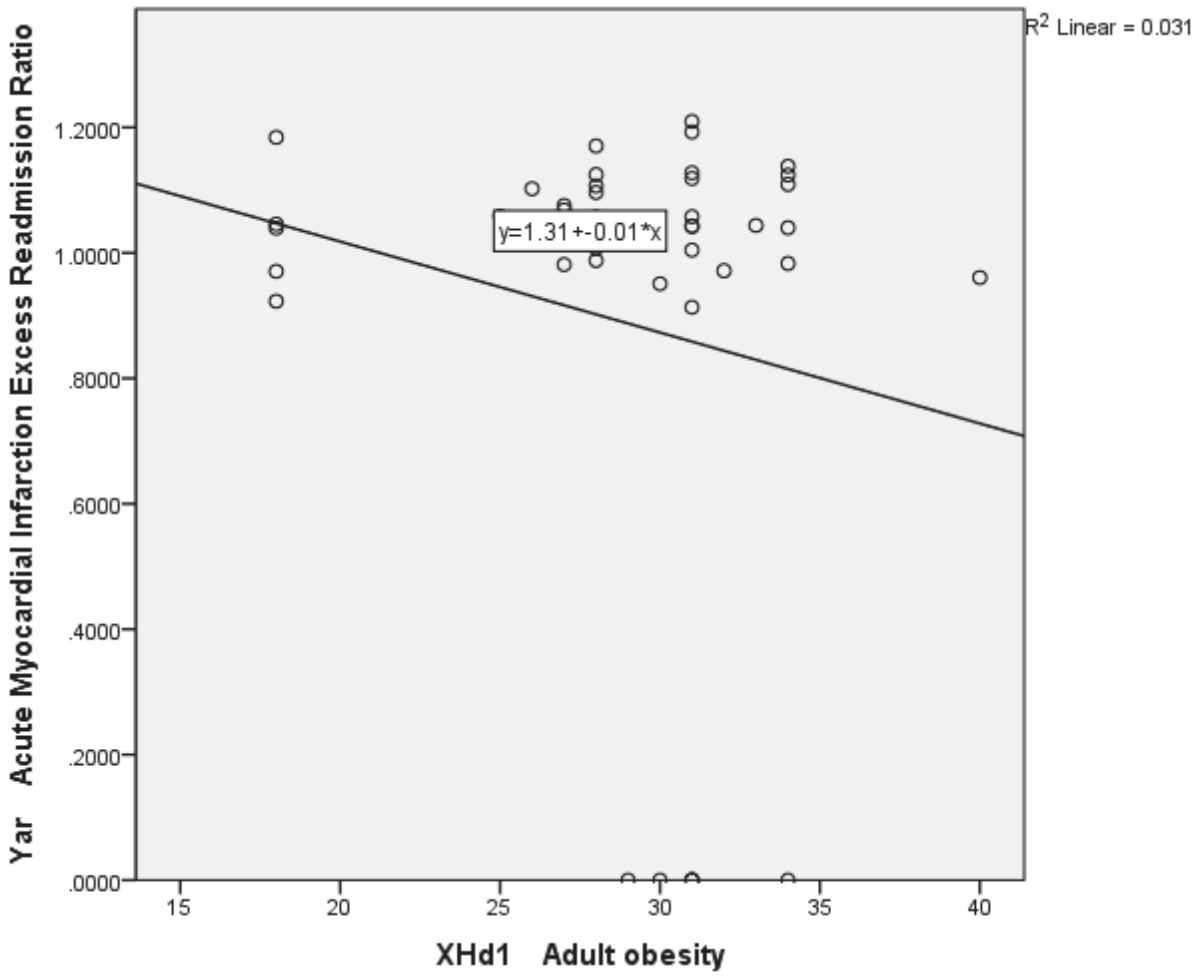
Alcohol Use: Motor vehicle crash death rate

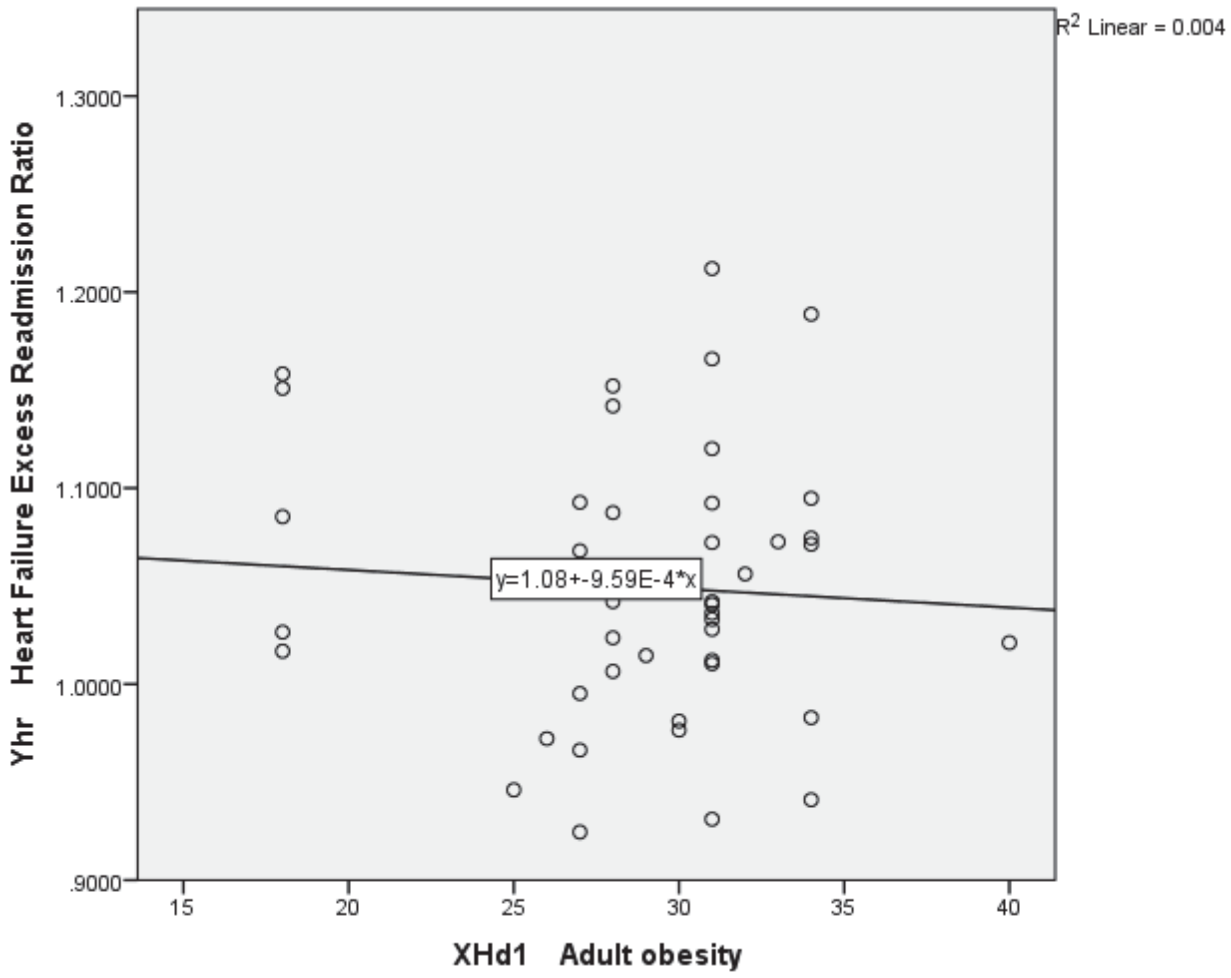


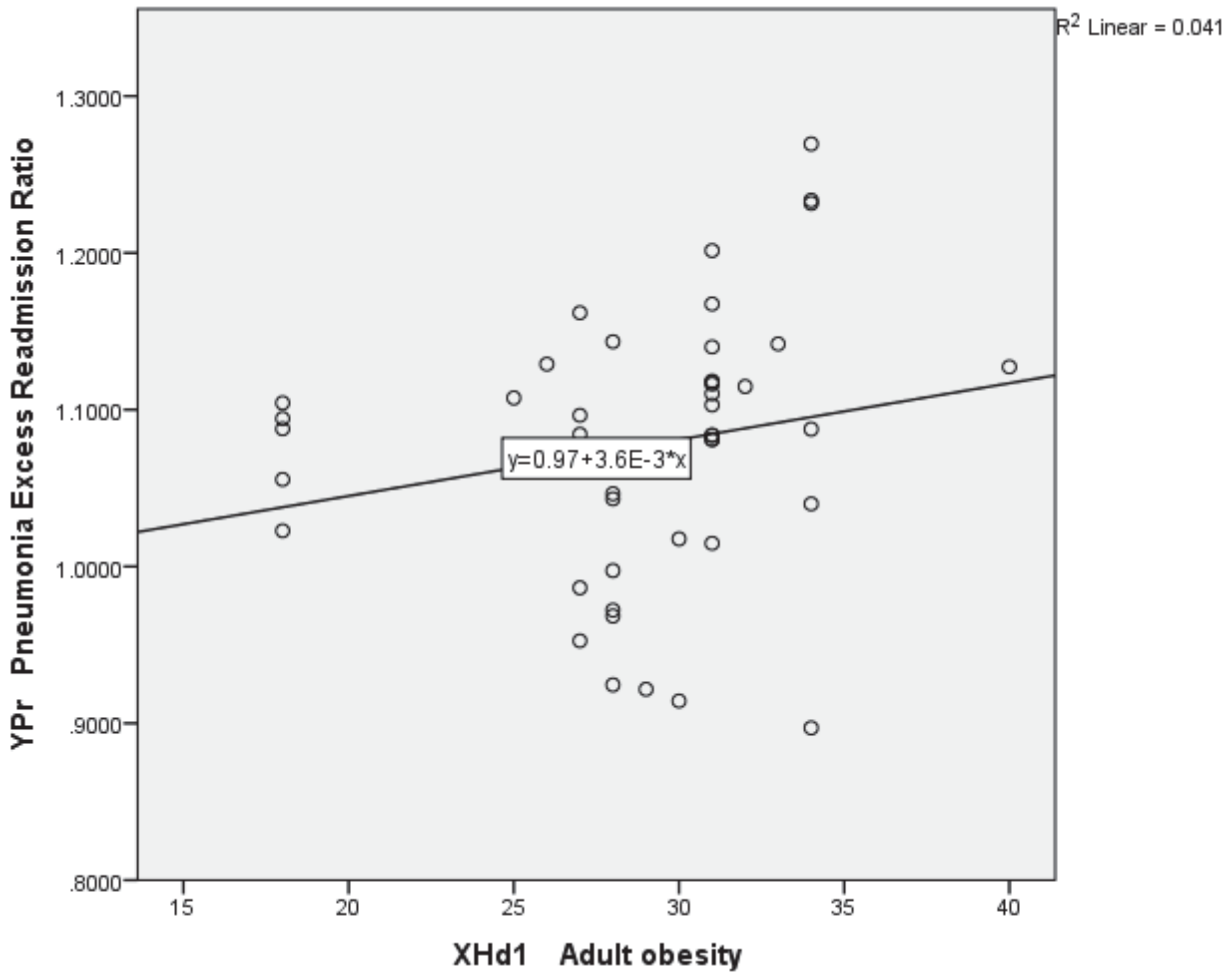

R2 Linear = 0.123
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.01+1.08E-4*x
.00
200.00
400.00
600.00
800.00
XHa2 Motor vehicle crash death rate


R2 Linear = 0.269
y=1.01+1.98E-4*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
.00
200.00
400.00
600.00
800.00
XHa2 Motor vehicle crash death rate

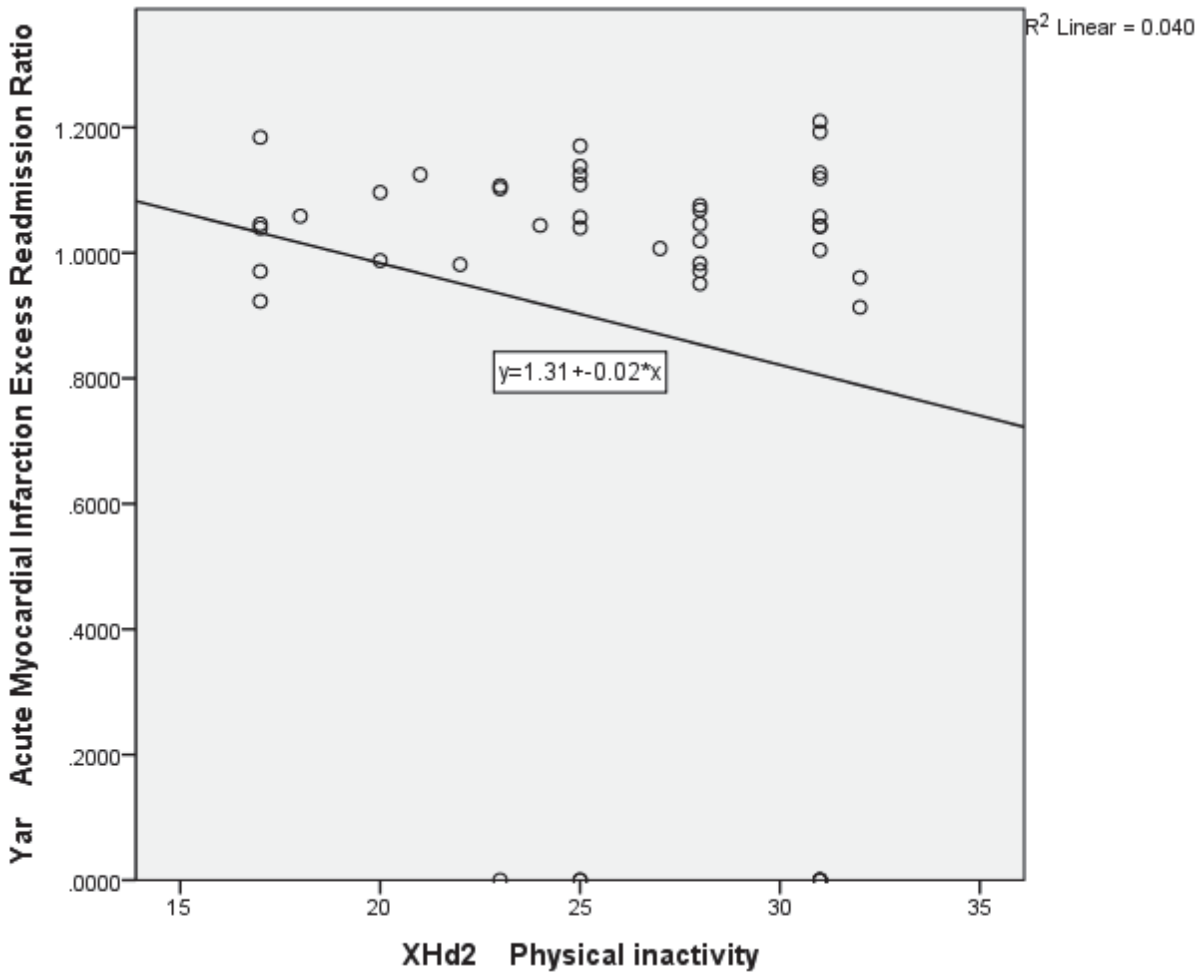
Diet and exercise: Adult obesity

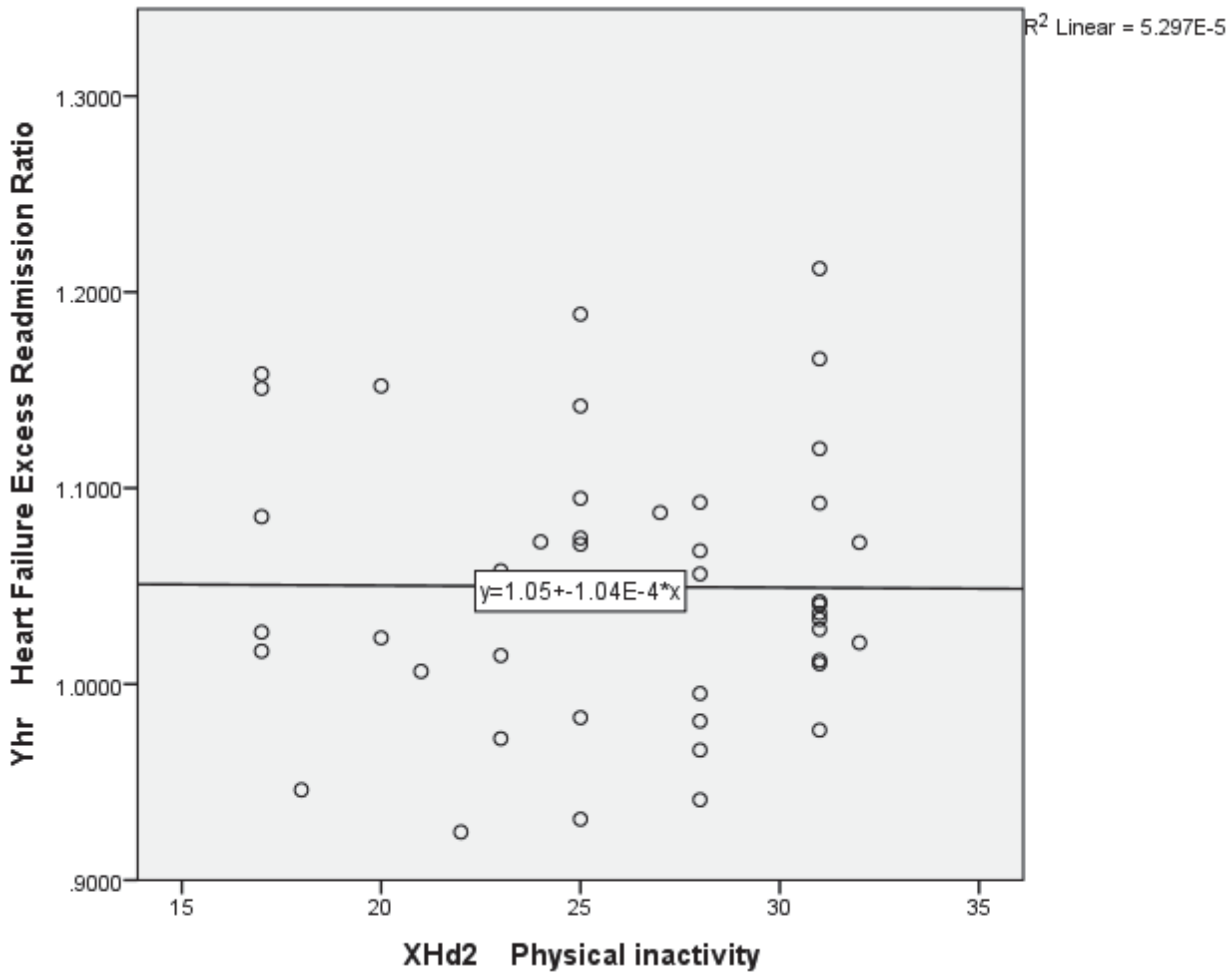


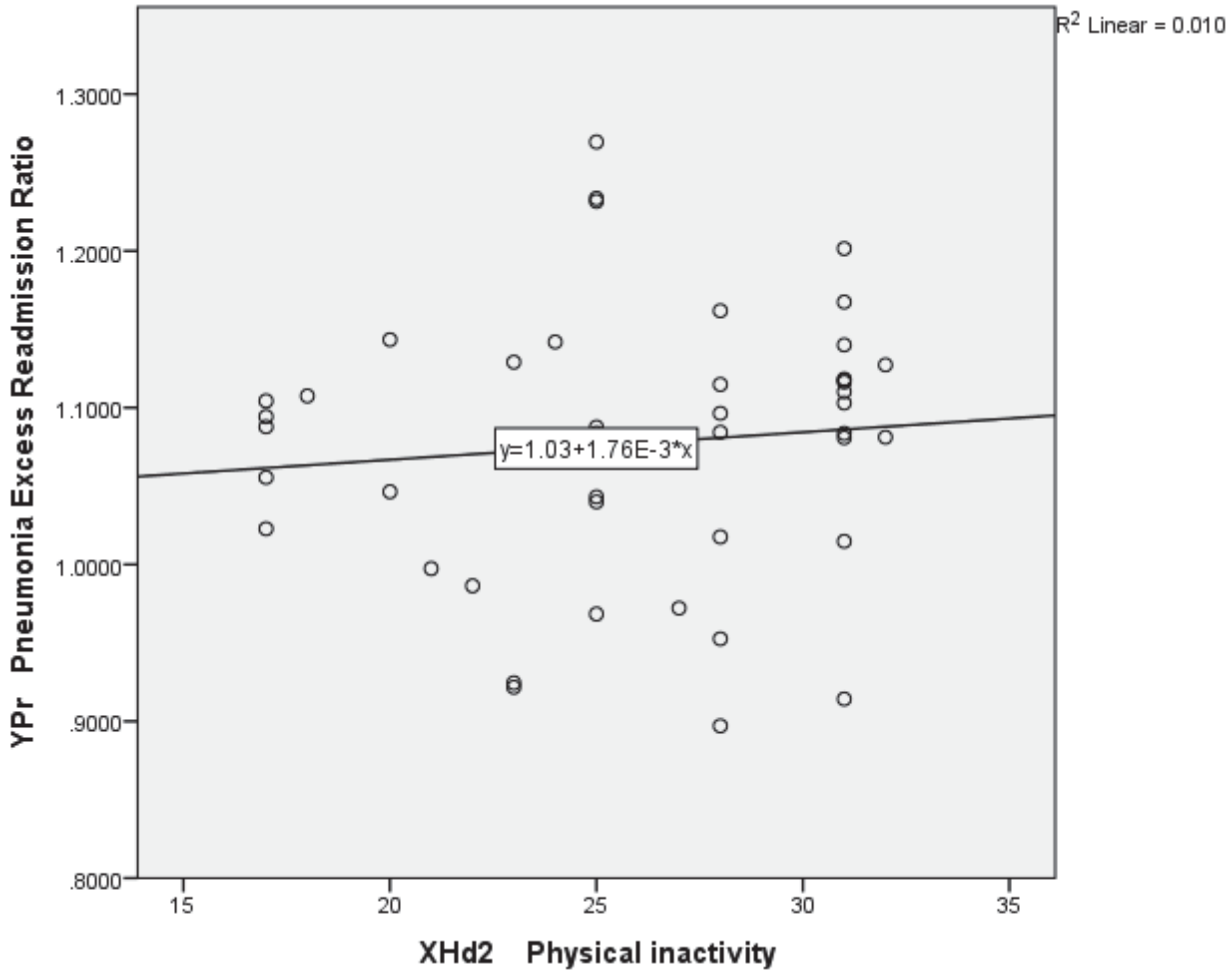

R2 Linear = 0.004
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.08+-9.59E-4*x
15
20
25
30
35
40
XHd1 Adult obesity


R2 Linear = 0.041
y=0.97+3.6E-3*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
15
20
25
30
35
40
XHd1 Adult obesity

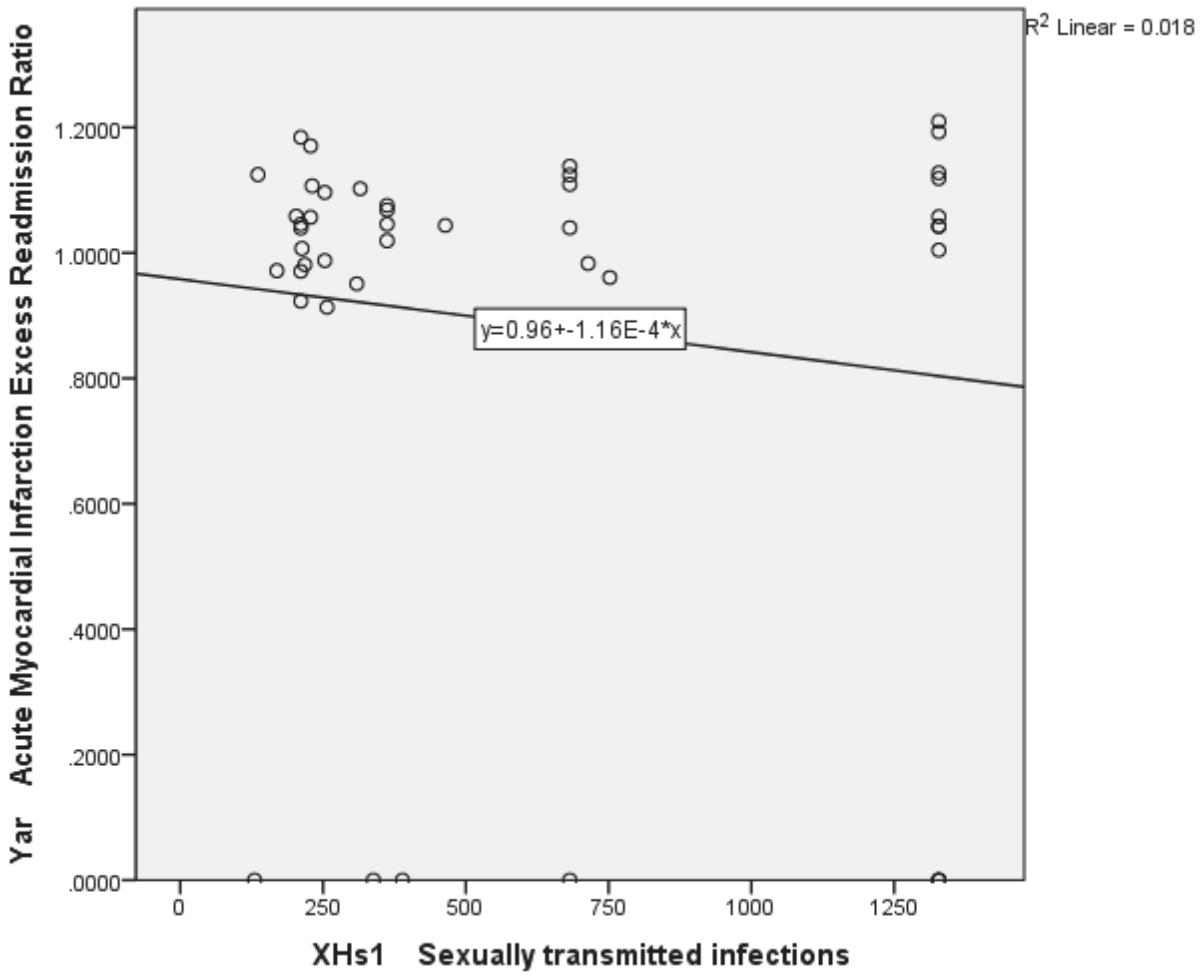
Diet and exercise: Physical in activity

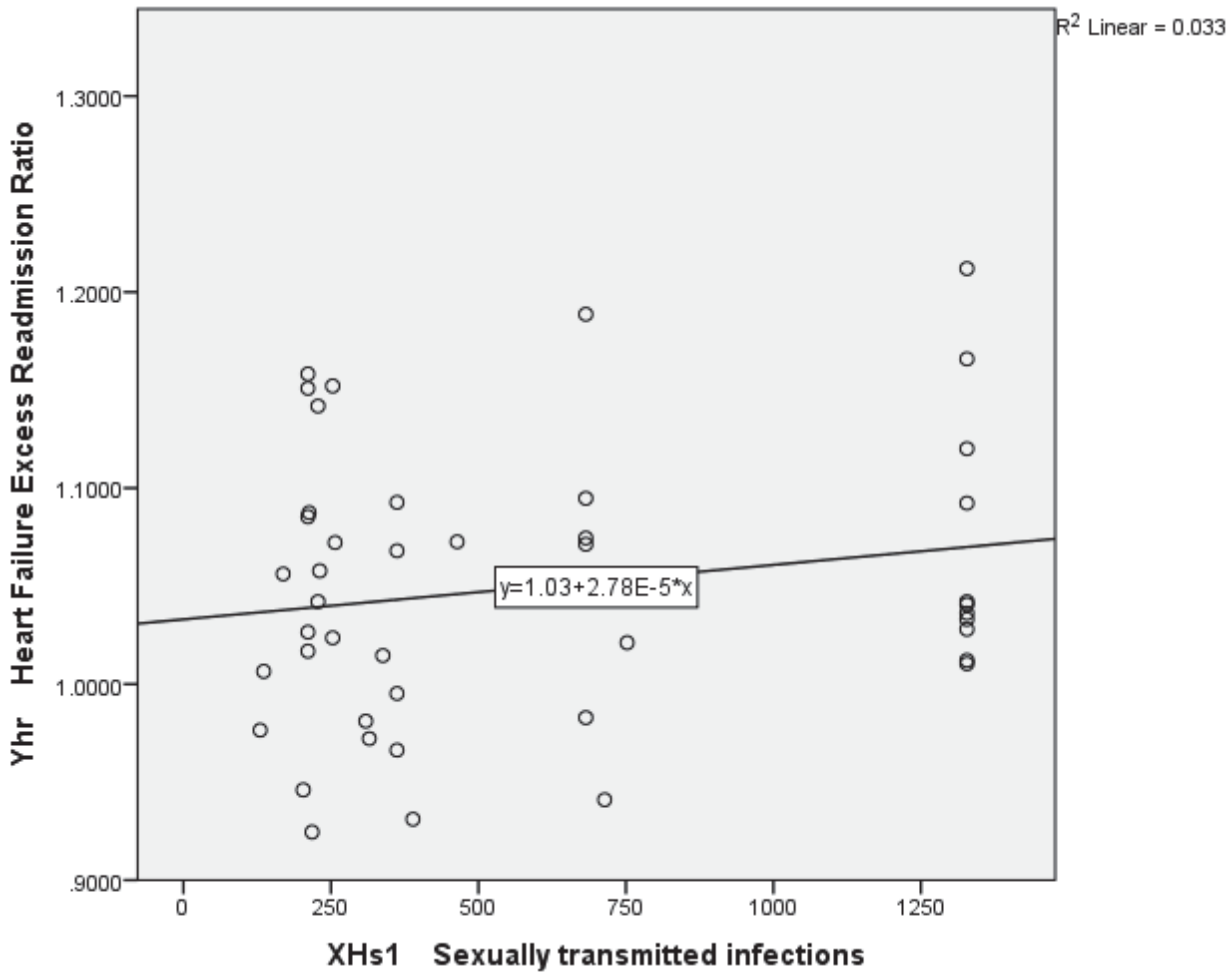


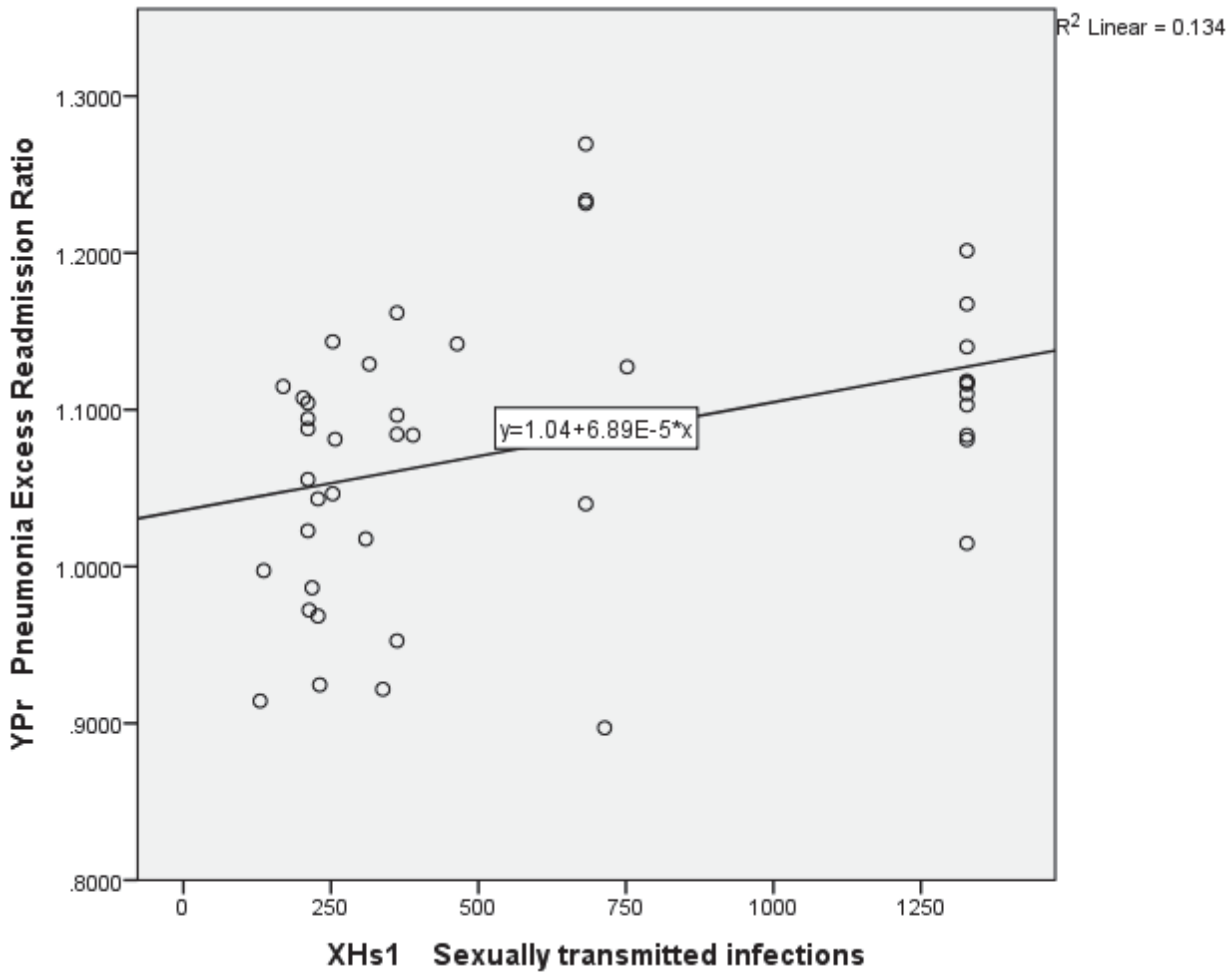

R2 Linear = 5.297E-5
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.05+-1.04E-4*x
15
20
25
30
35
XHd2 Physical inactivity


R2 Linear = 0.010
y=1.03+1.76E-3*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
15
20
25
30
35
XHd2 Physical inactivity

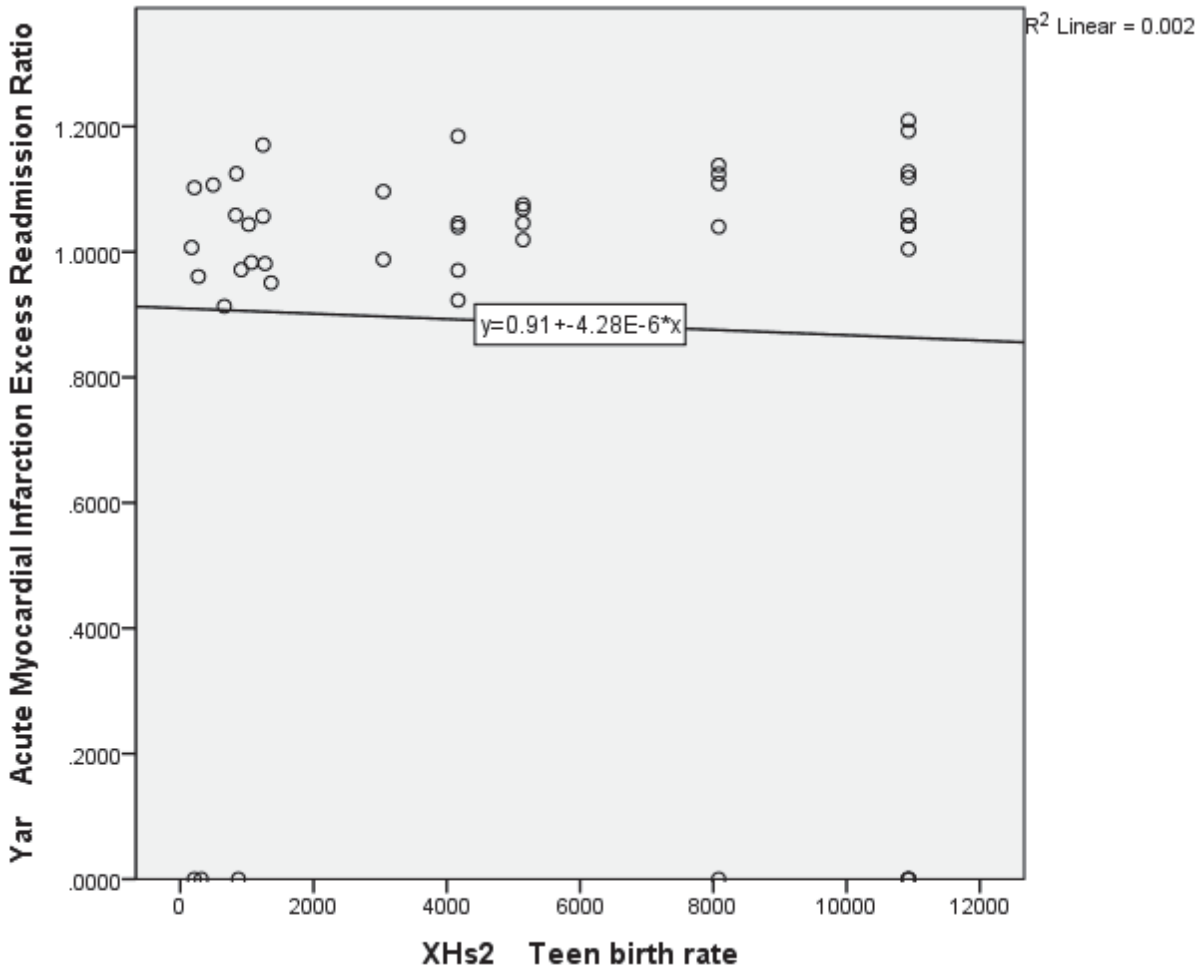
Sexual Activity: Sexually transmitted infections

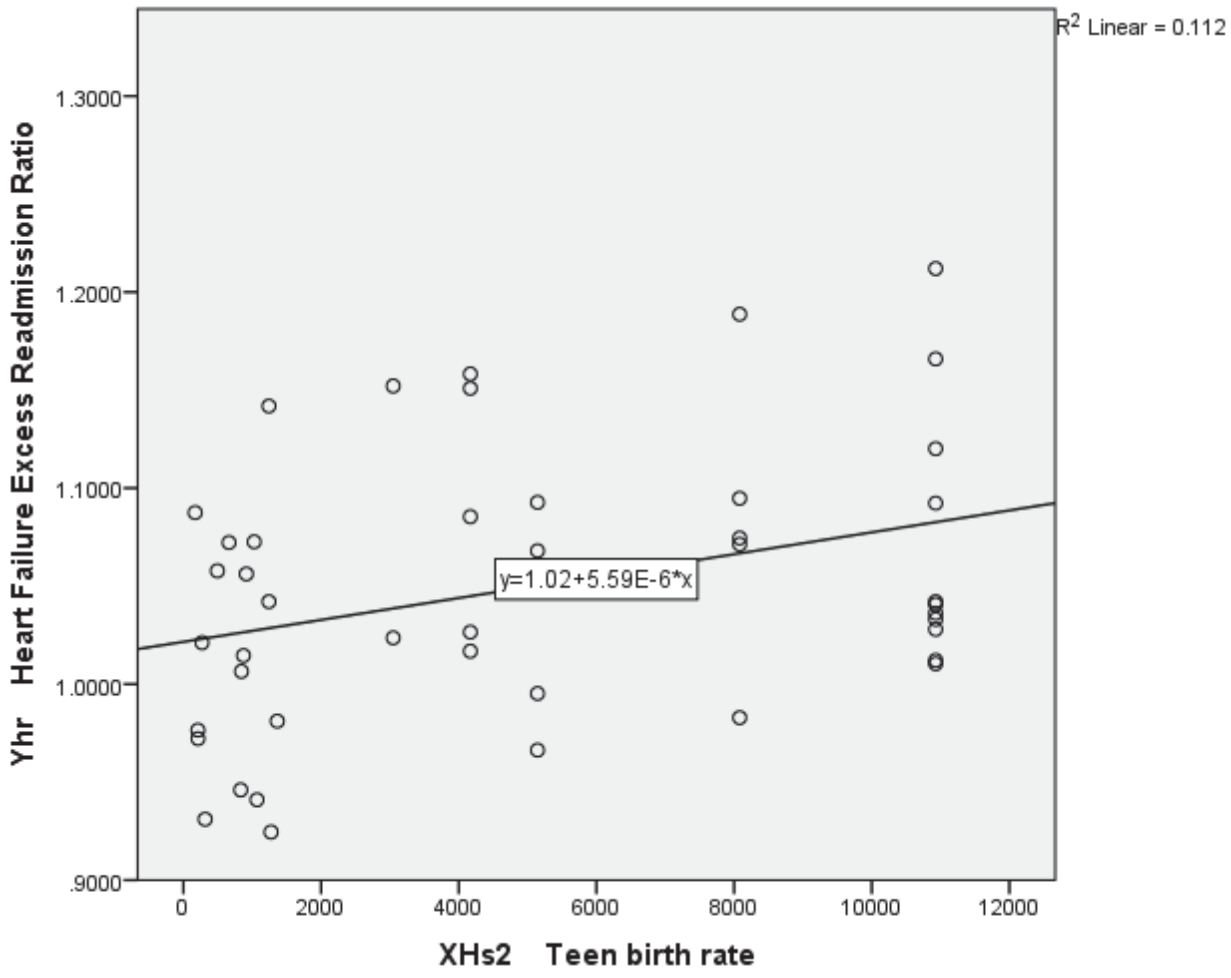


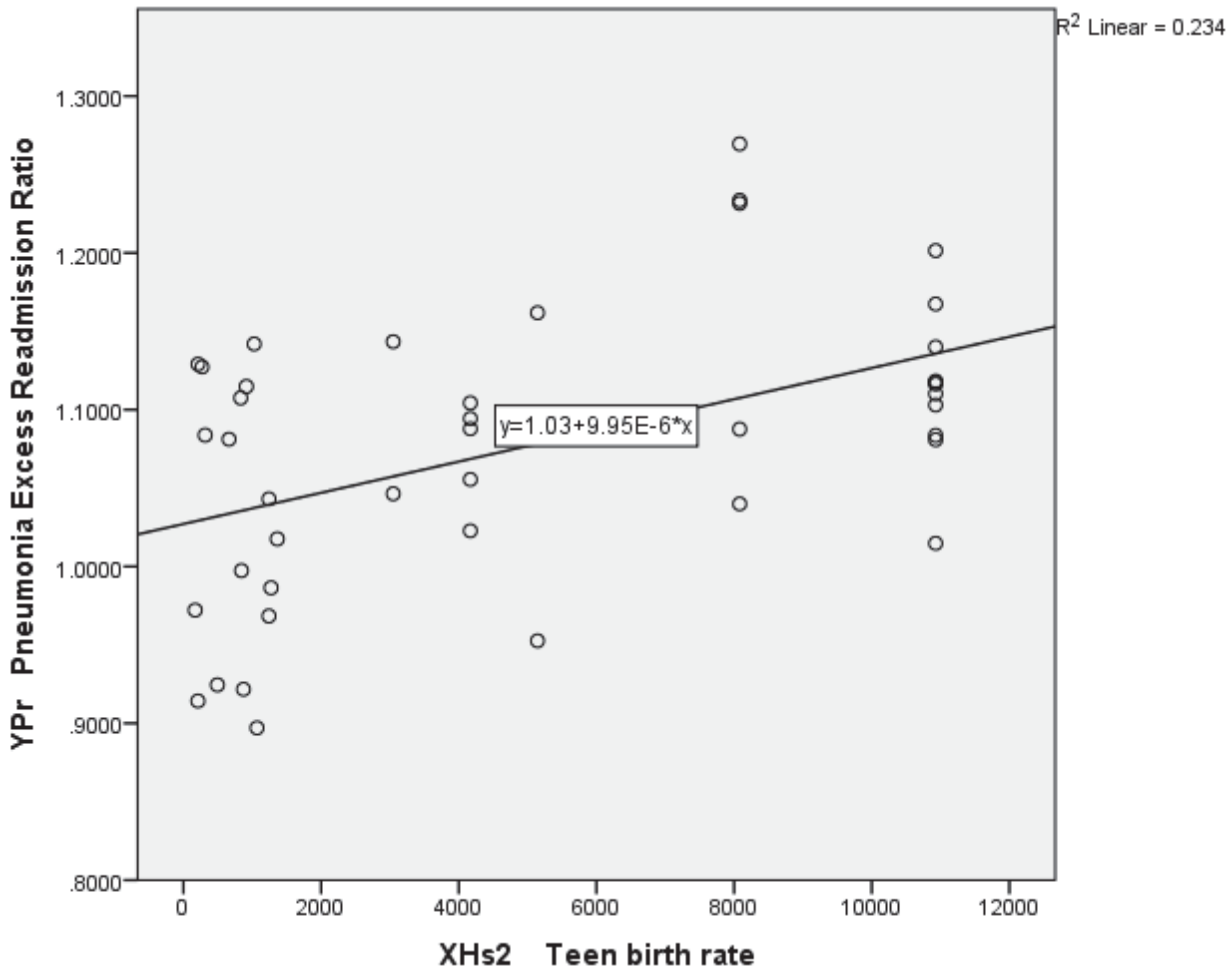

R2 Linear = 0.033
y=1.03+2.78E-5*x
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
0
250
500
750
1000
1250
XHs1 Sexually transmitted infections


R2 Linear = 0.134
y=1.04+6.89E-5*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
0
250
500
750
1000
1250
XHs1 Sexually transmitted infections

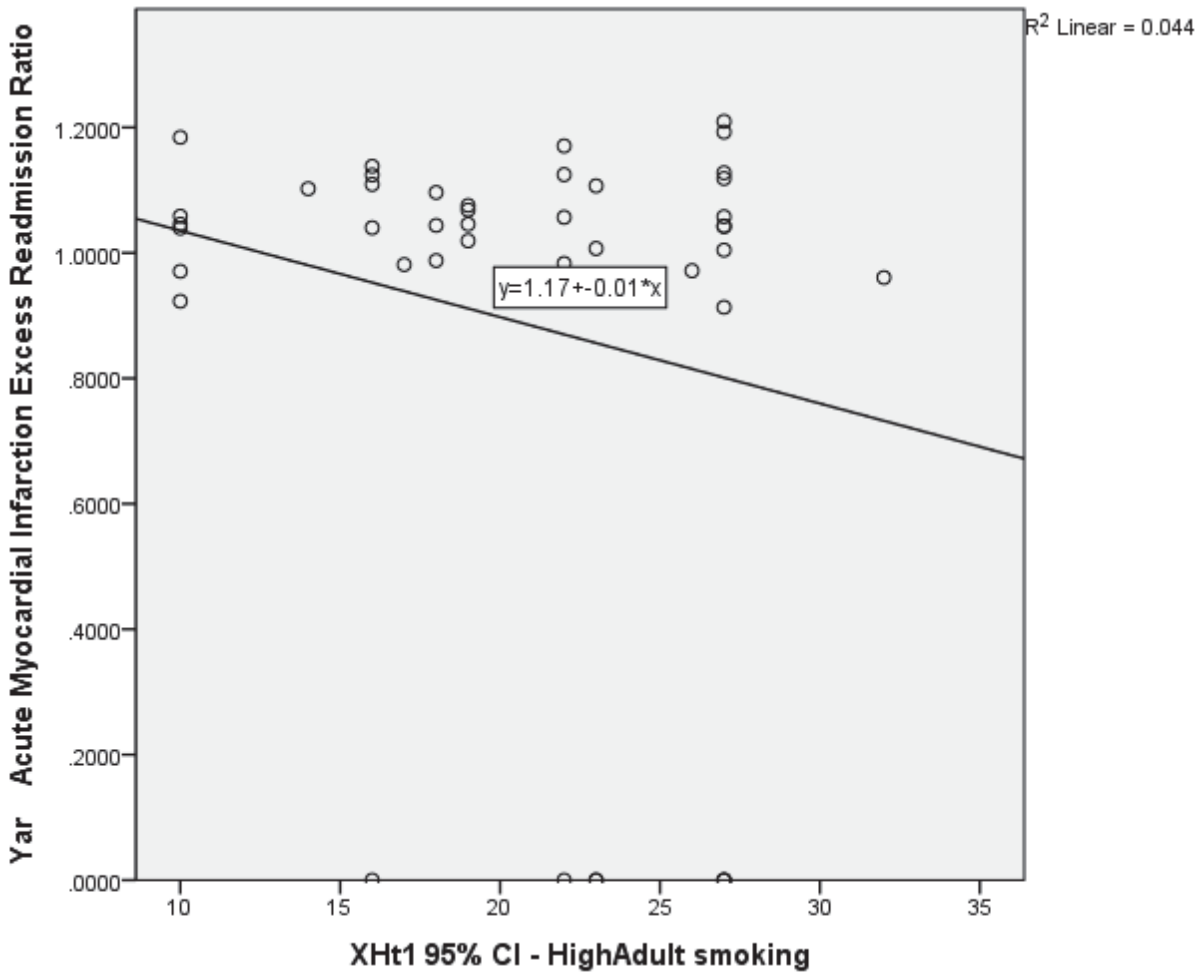
Sexual Activity: Teen birth rate

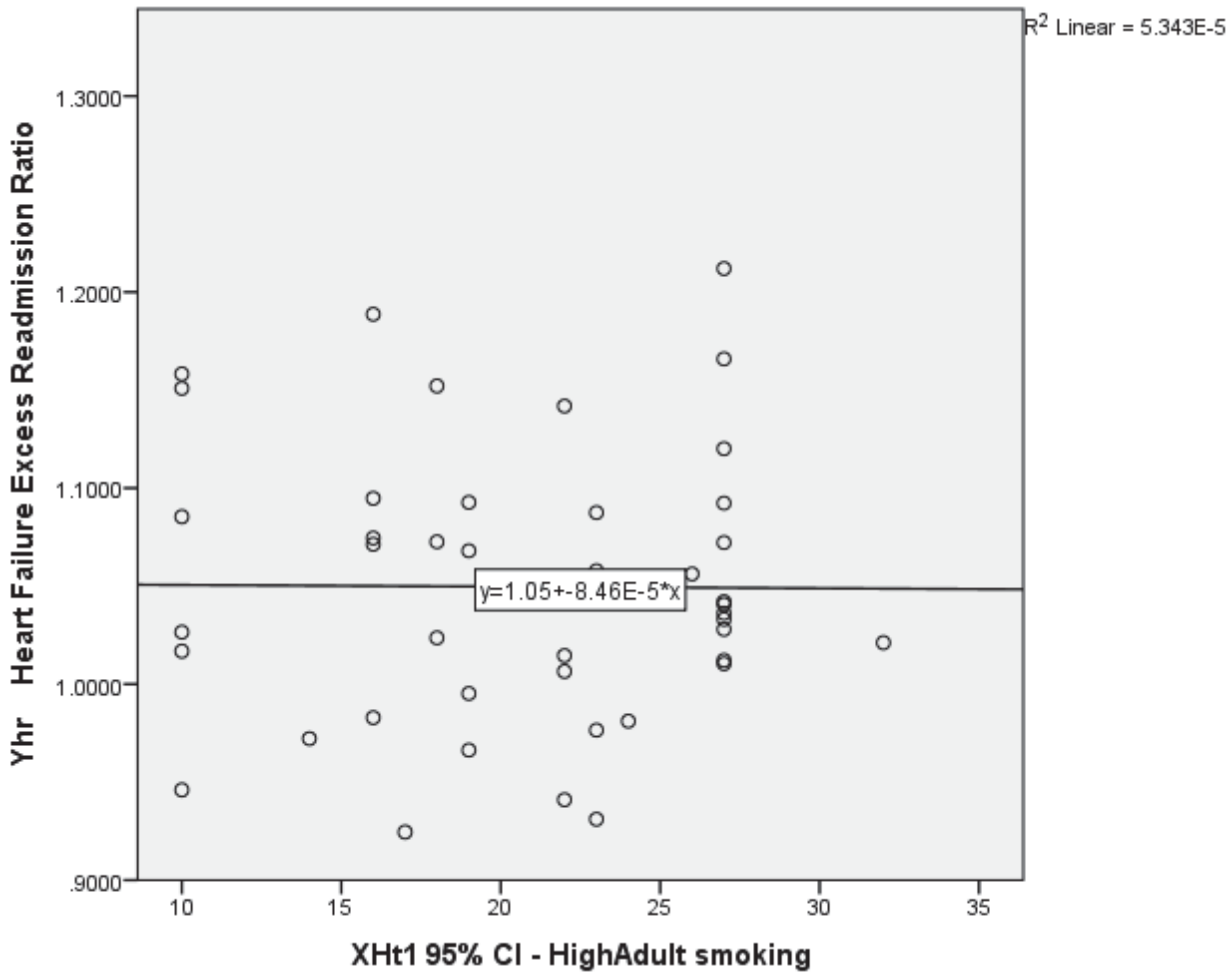


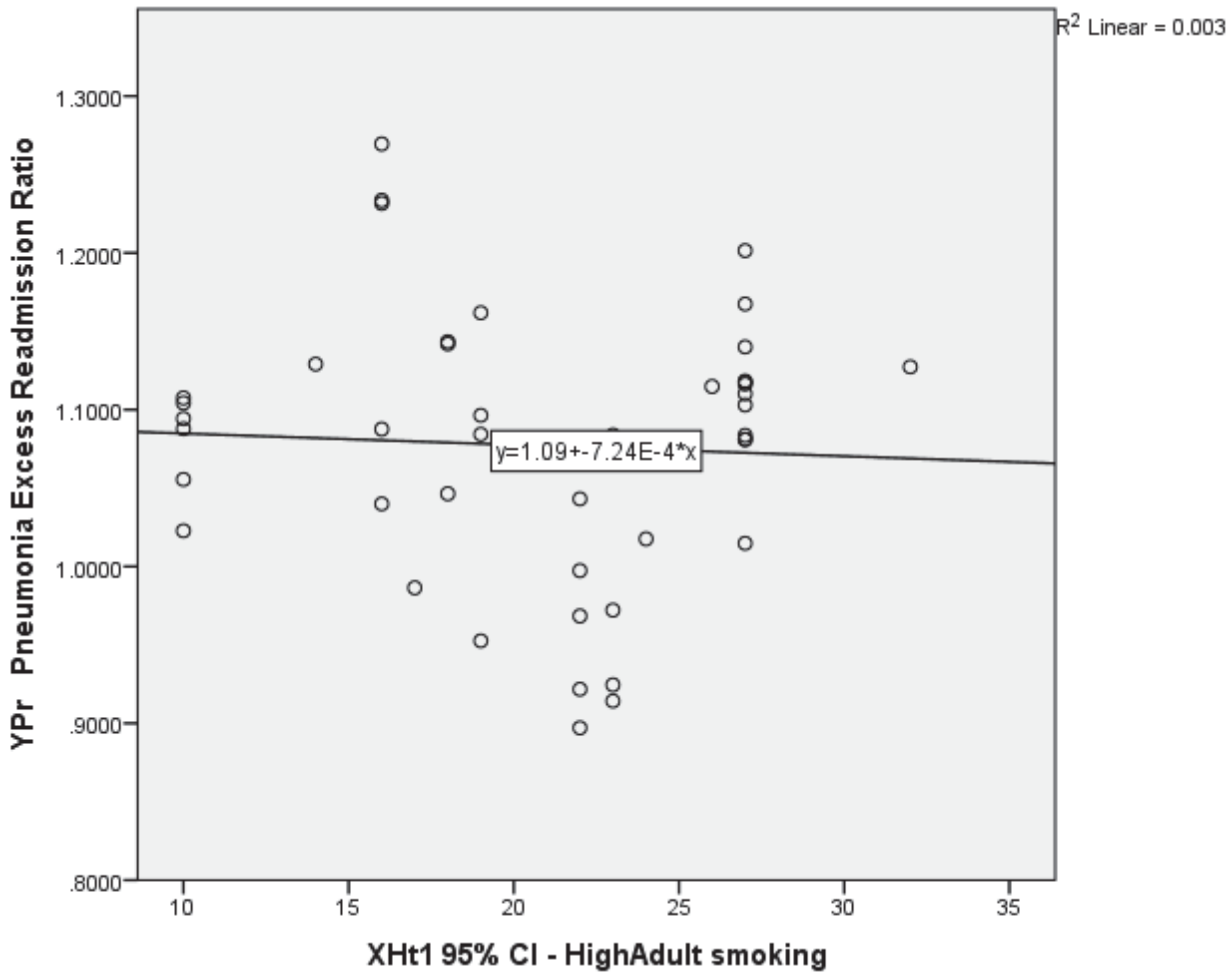

R2 Linear = 0.112
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.02+5.59E-6*x
0
2000
4000
6000
8000
10000
12000
XHs2 Teen birth rate


R2 Linear = 0.234
y=1.03+9.95E-6*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
0
2000
4000
6000
8000
10000
12000
XHs2 Teen birth rate

Tobacco Use: Adult smoking

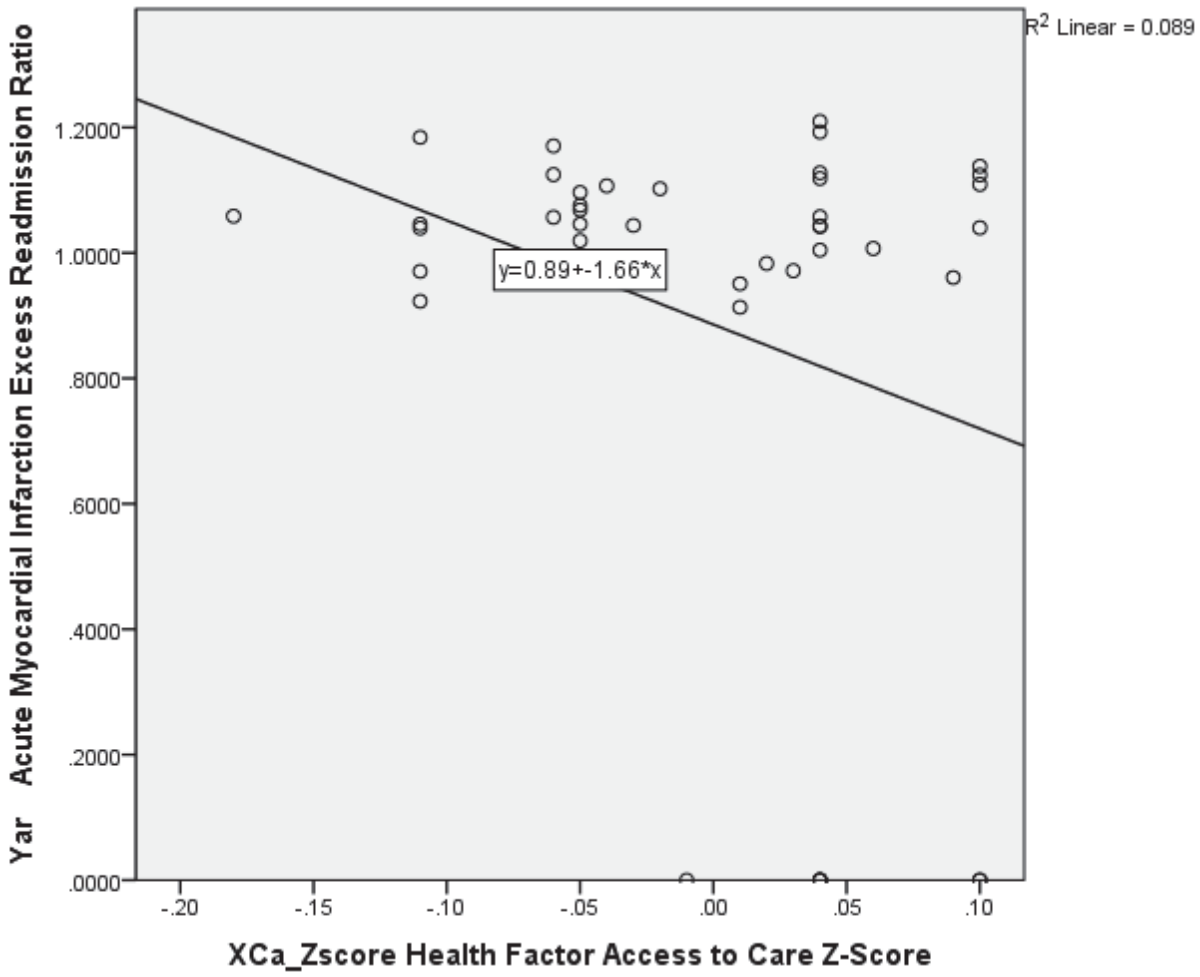


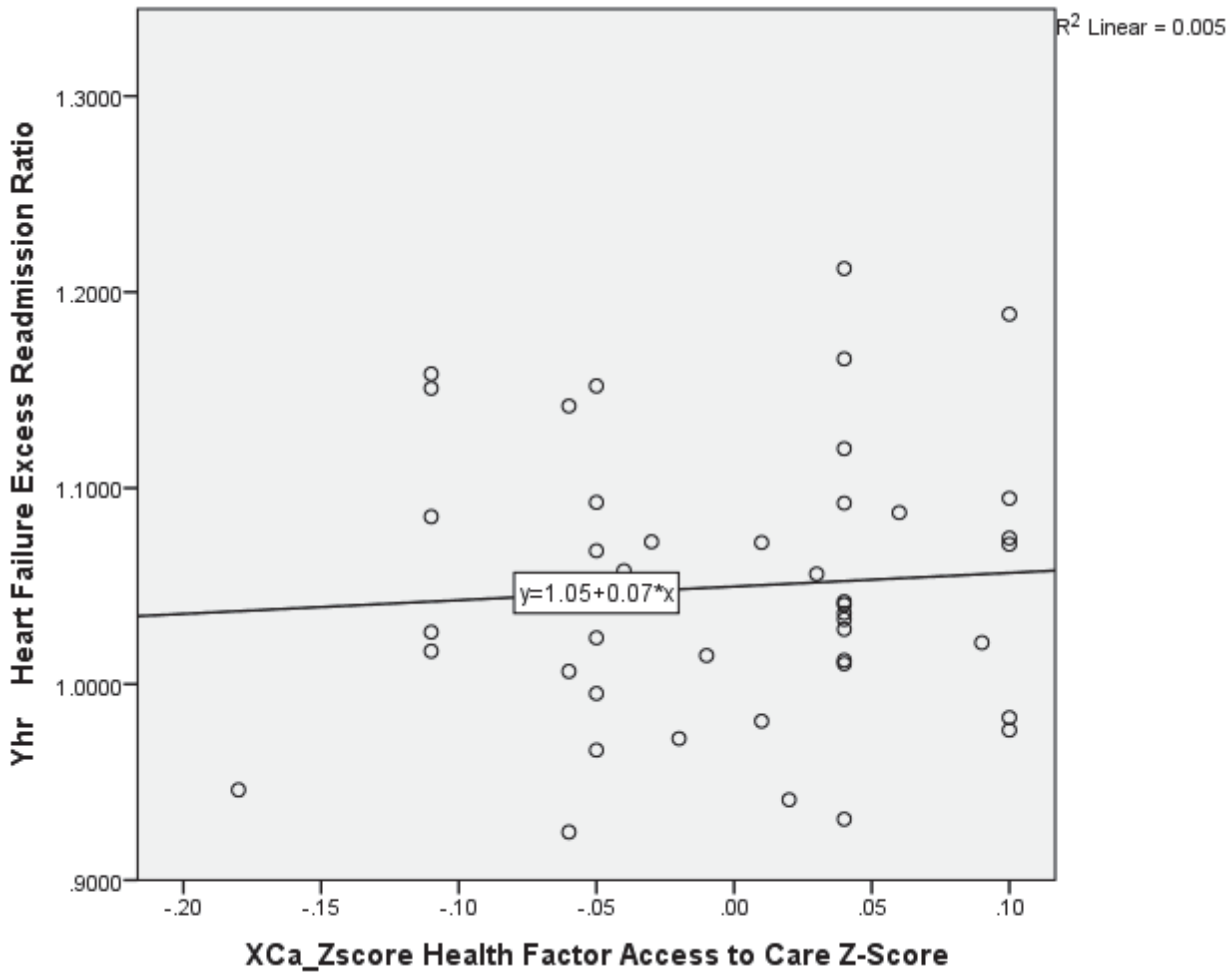

R2 Linear = 5.343E-5
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.05+-8.46E-5*x
10
15
20
25
30
35
XHt1 95% CI - HighAdult smoking

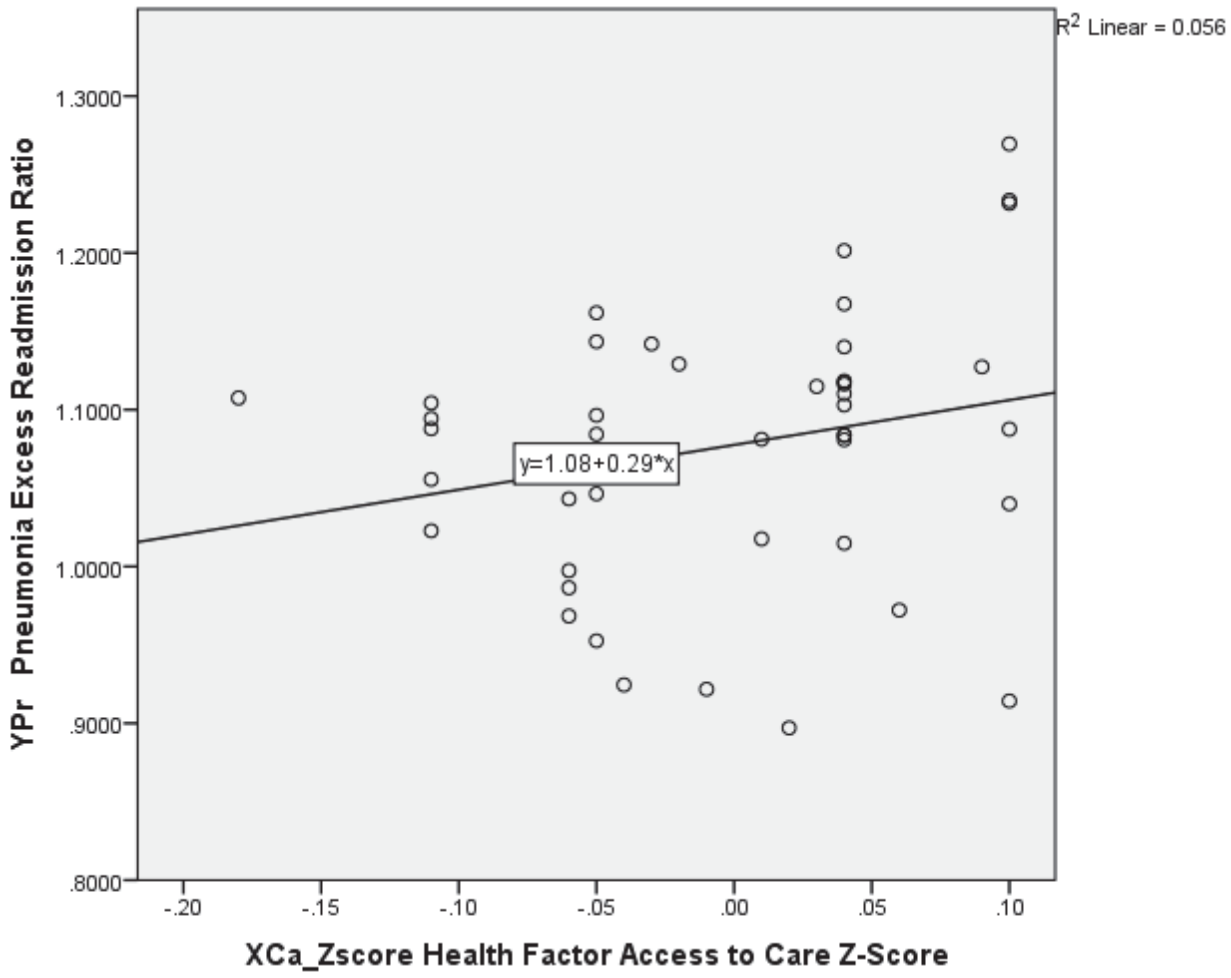

R2 Linear = 0.003
y=1.09+-7.24E-4*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
10
15
20
25
30
35
XHt1 95% CI - HighAdult smoking

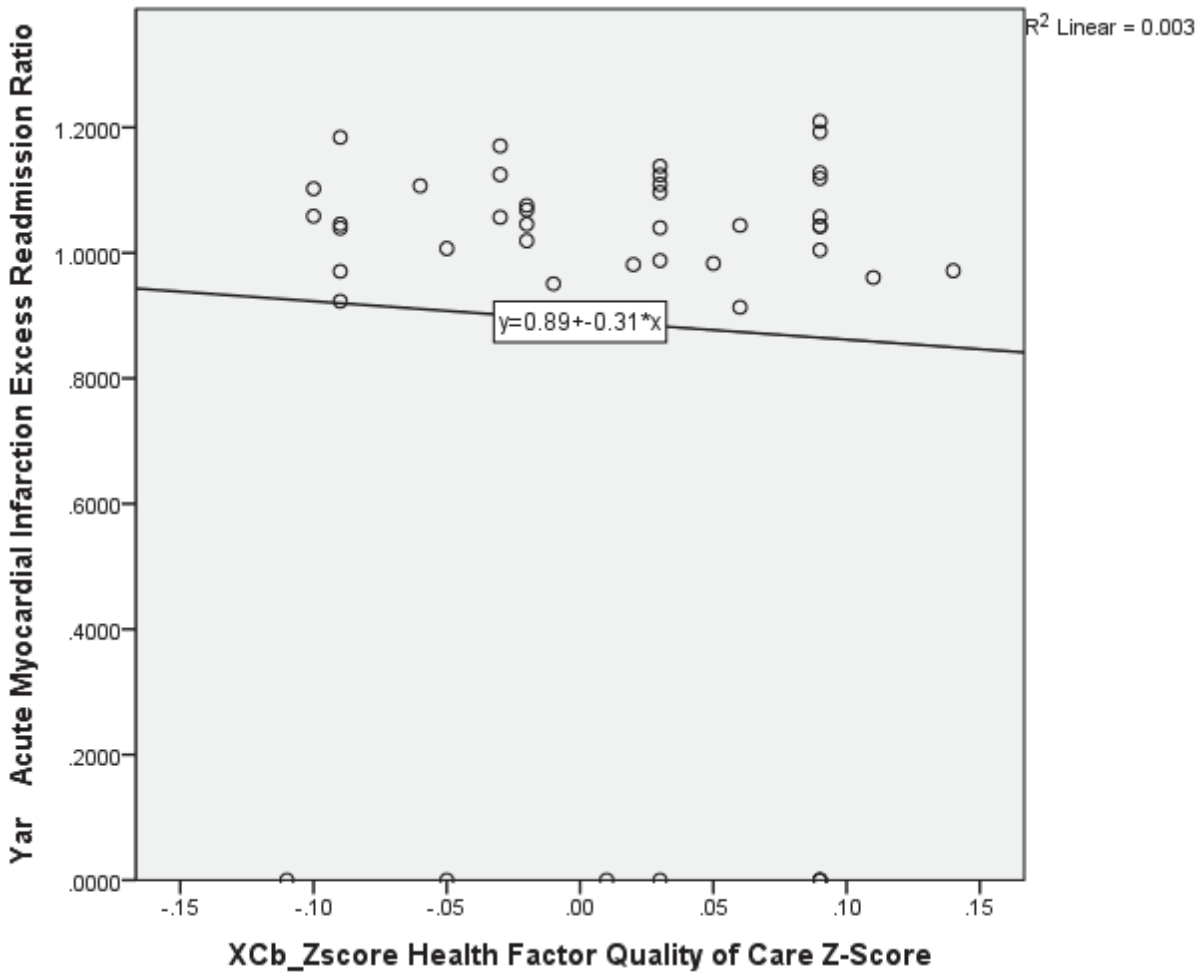
Appendix J: Health Factors Plots

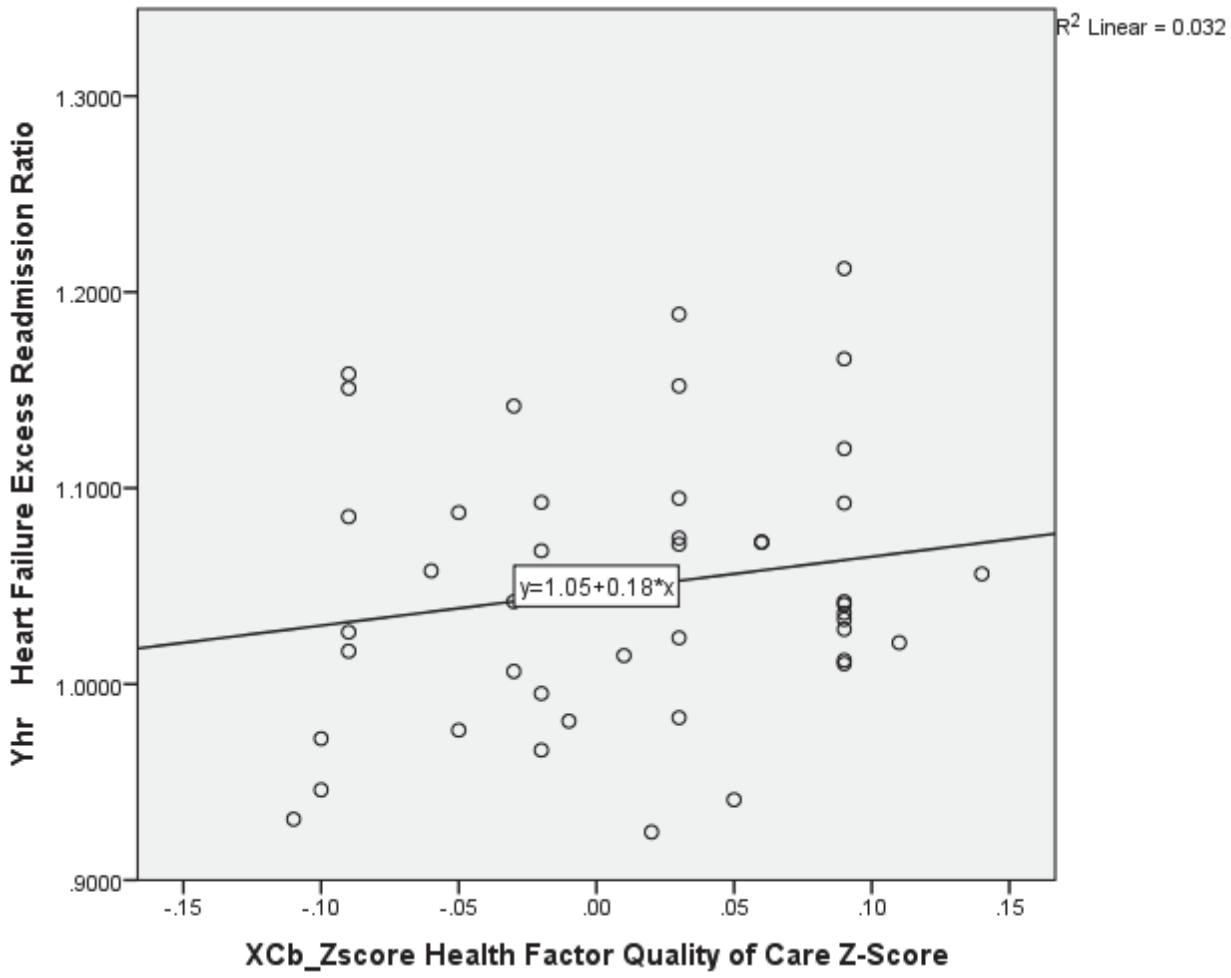
All Variables

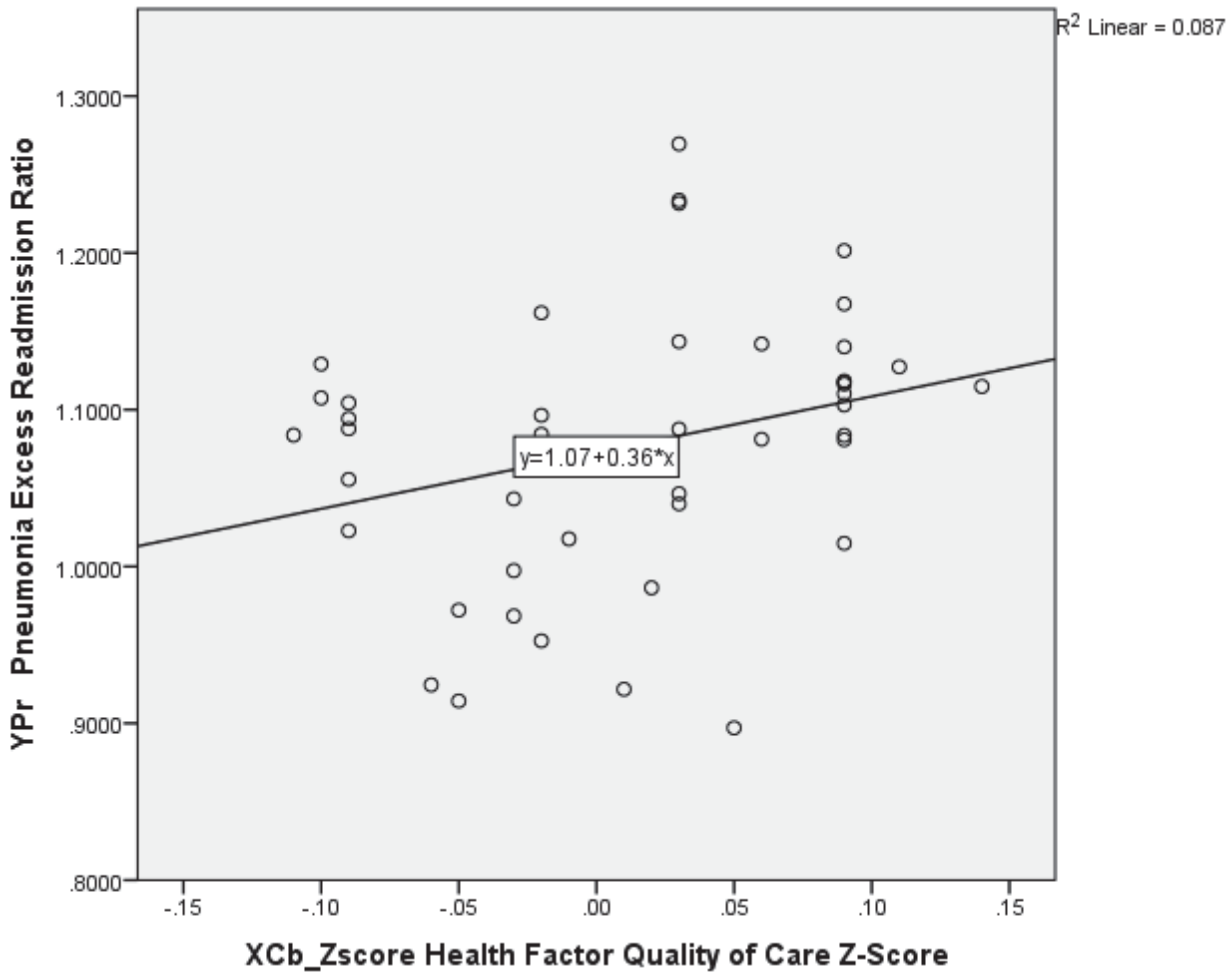


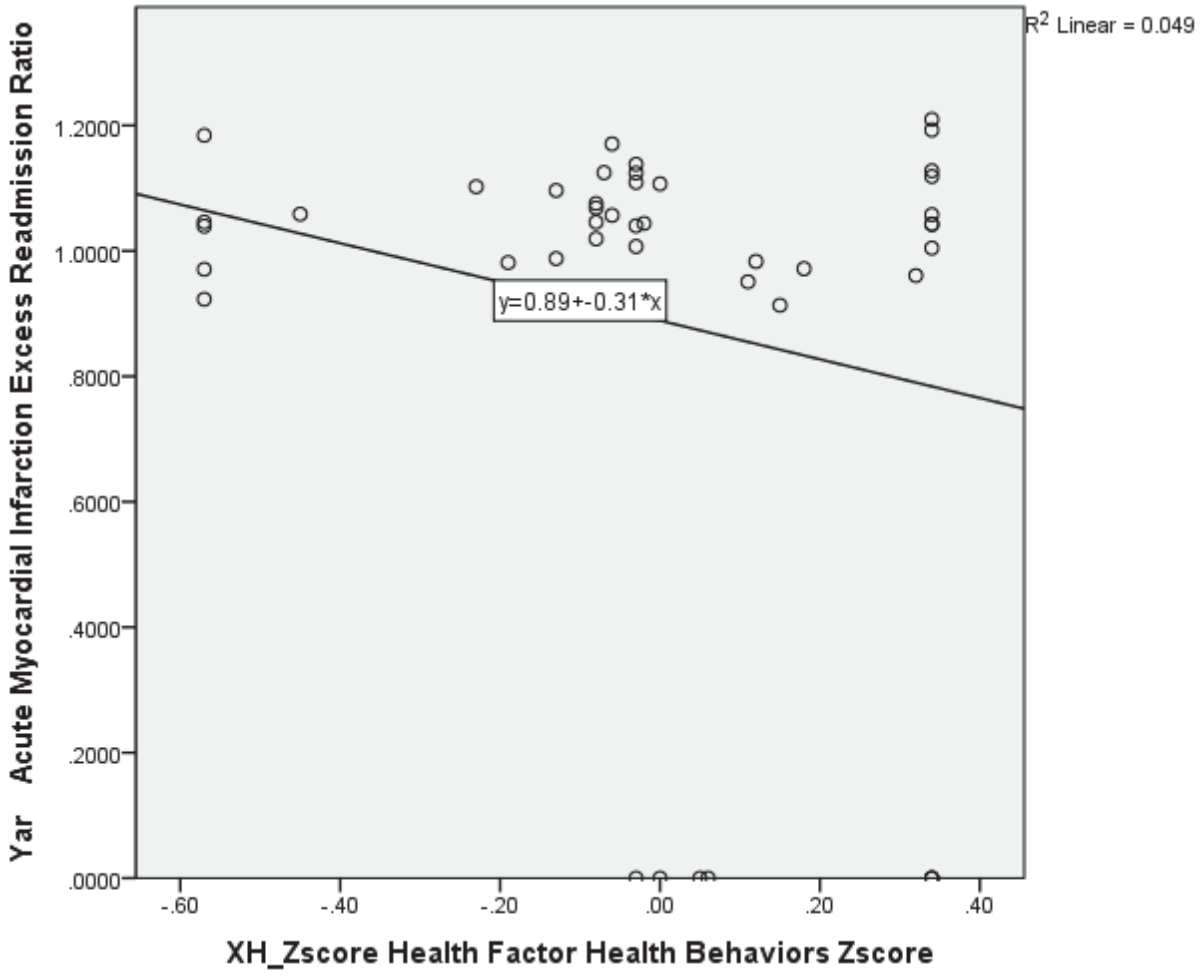

R2 Linear = 0.005
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.05+0.07*x
-.20
-.15
-.10
-.05
.00
.05
.10
XCa_Zscore Health Factor Access to Care Z-Score

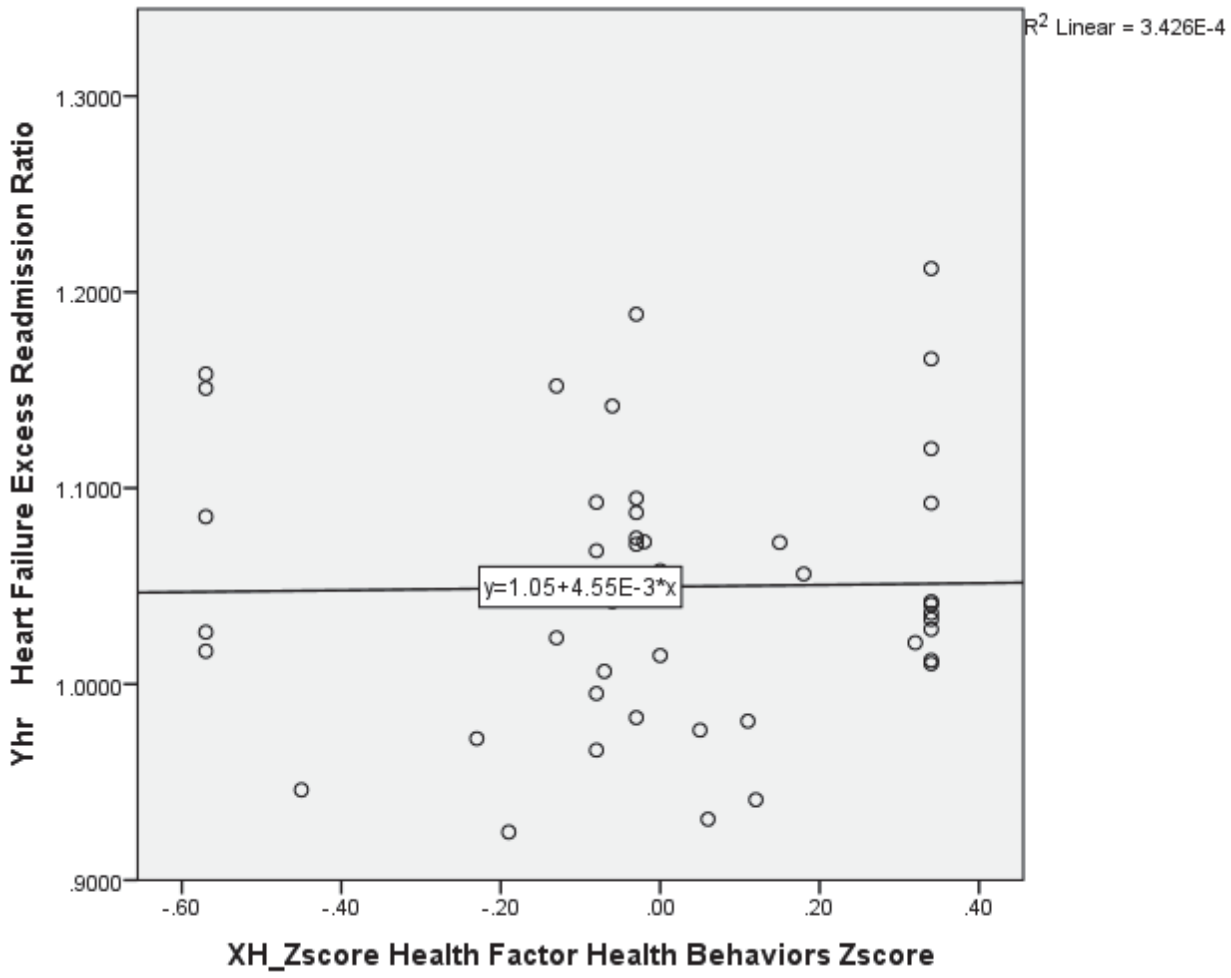

R2 Linear = 0.056
y=1.08+0.29*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
-.20
-.15
-.10
-.05
.00
.05
.10
XCa_Zscore Health Factor Access to Care Z-Score

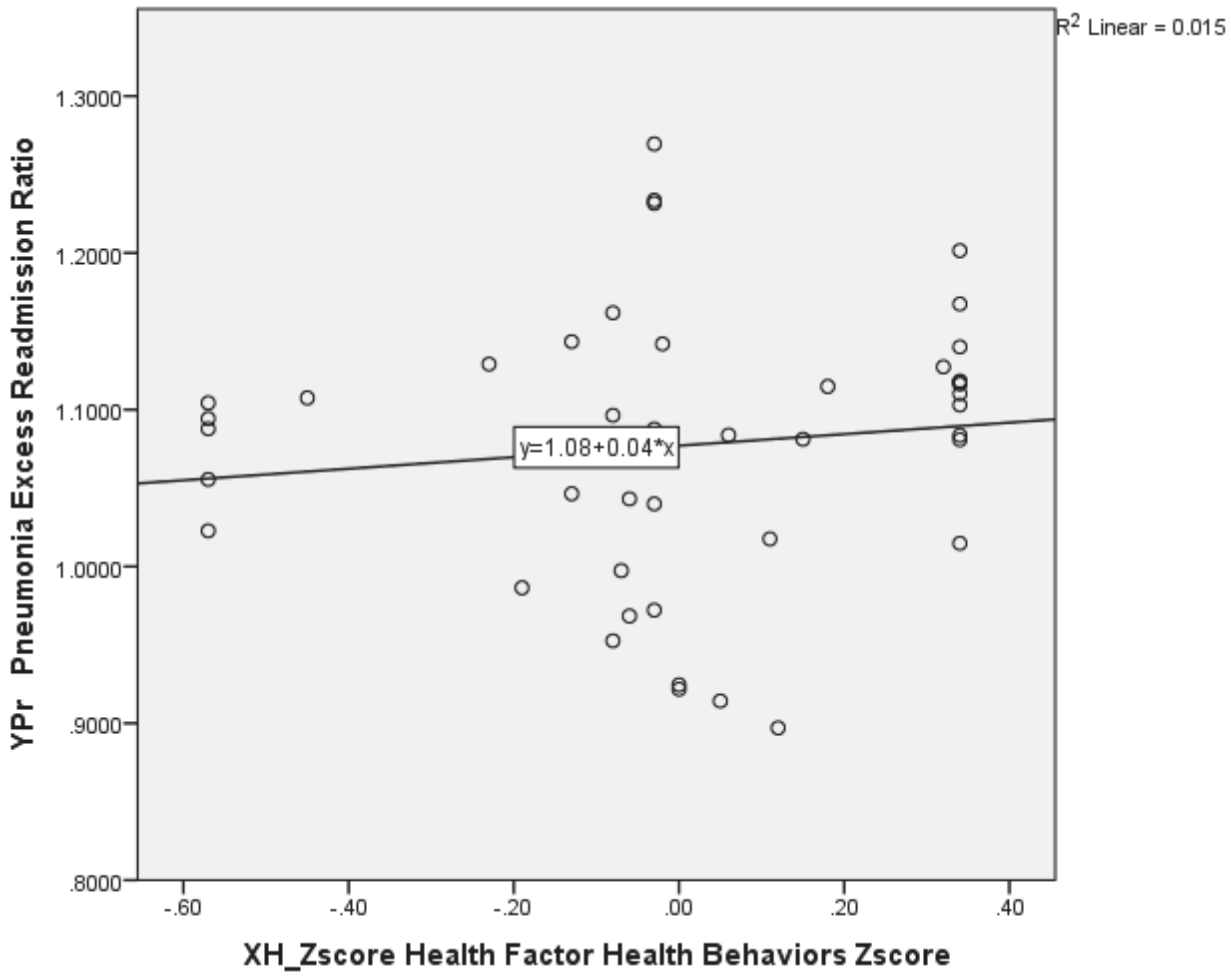

R2 Linear = 0.003
Yar Acute Myocardial Infarction Excess Readmission Ratio
1.2000
1.0000
.8000
.6000
.4000
.2000
.0000
y=0.89+-0.31*x
-.15
-.10
-.05
.00
.05
.10
.15
XCb_Zscore Health Factor Quality of Care Z-Score

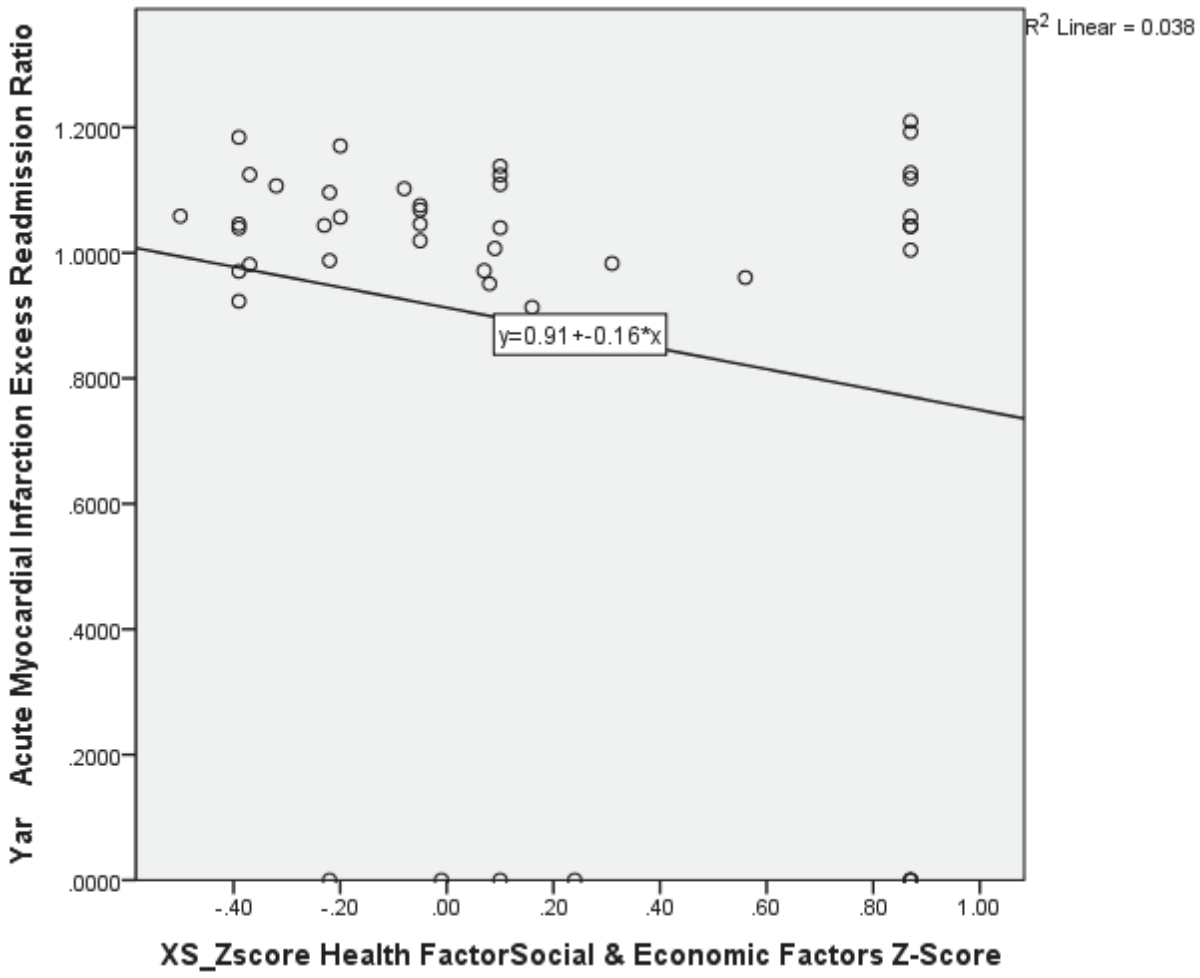

R2 Linear = 0.032
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.05+0.18*x
-.15
-.10
-.05
.00
.05
.10
.15
XCb_Zscore Health Factor Quality of Care Z-Score

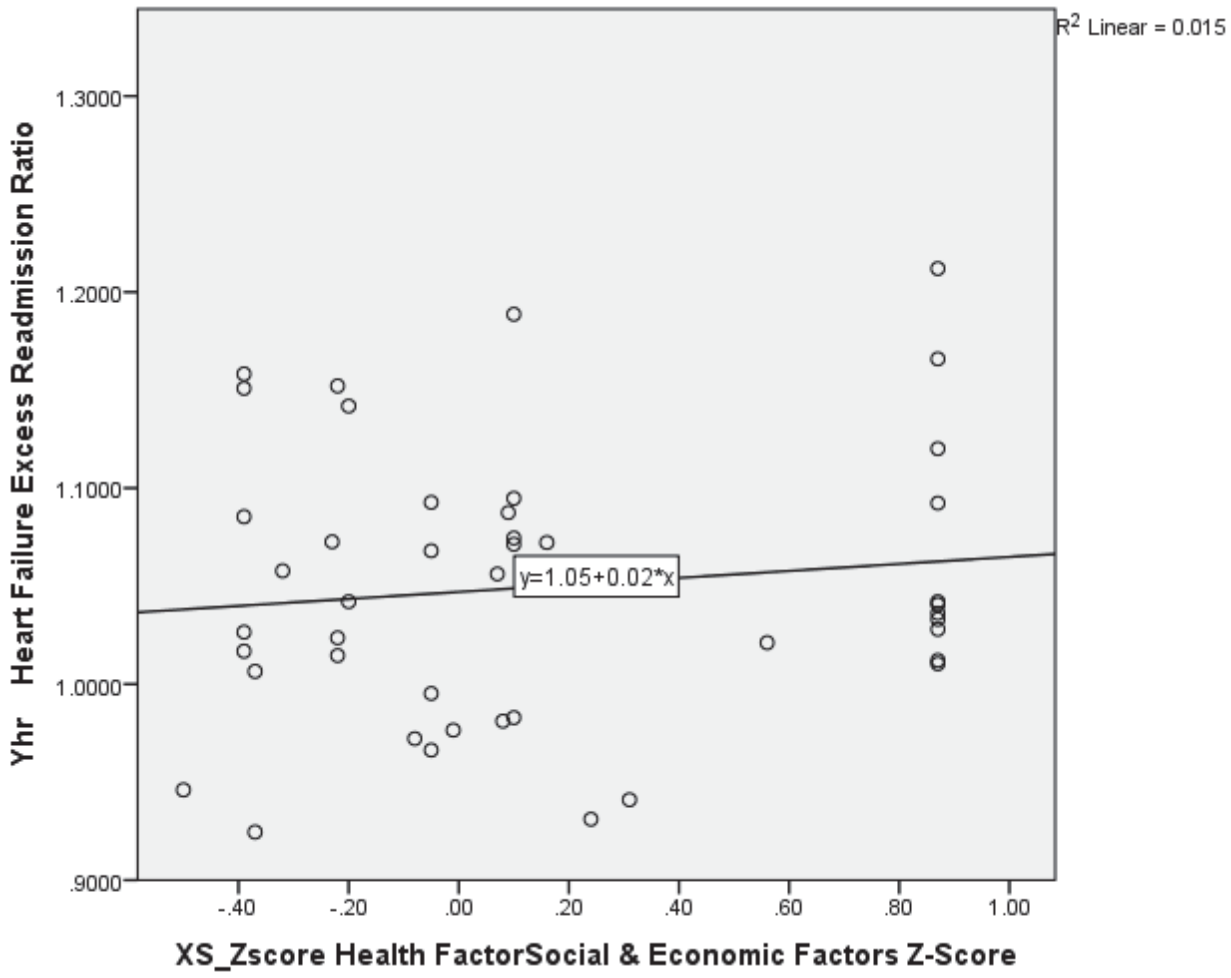

R2 Linear = 0.087
y=1.07+0.36*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
-.15
-.10
-.05
.00
.05
.10
.15
XCb_Zscore Health Factor Quality of Care Z-Score

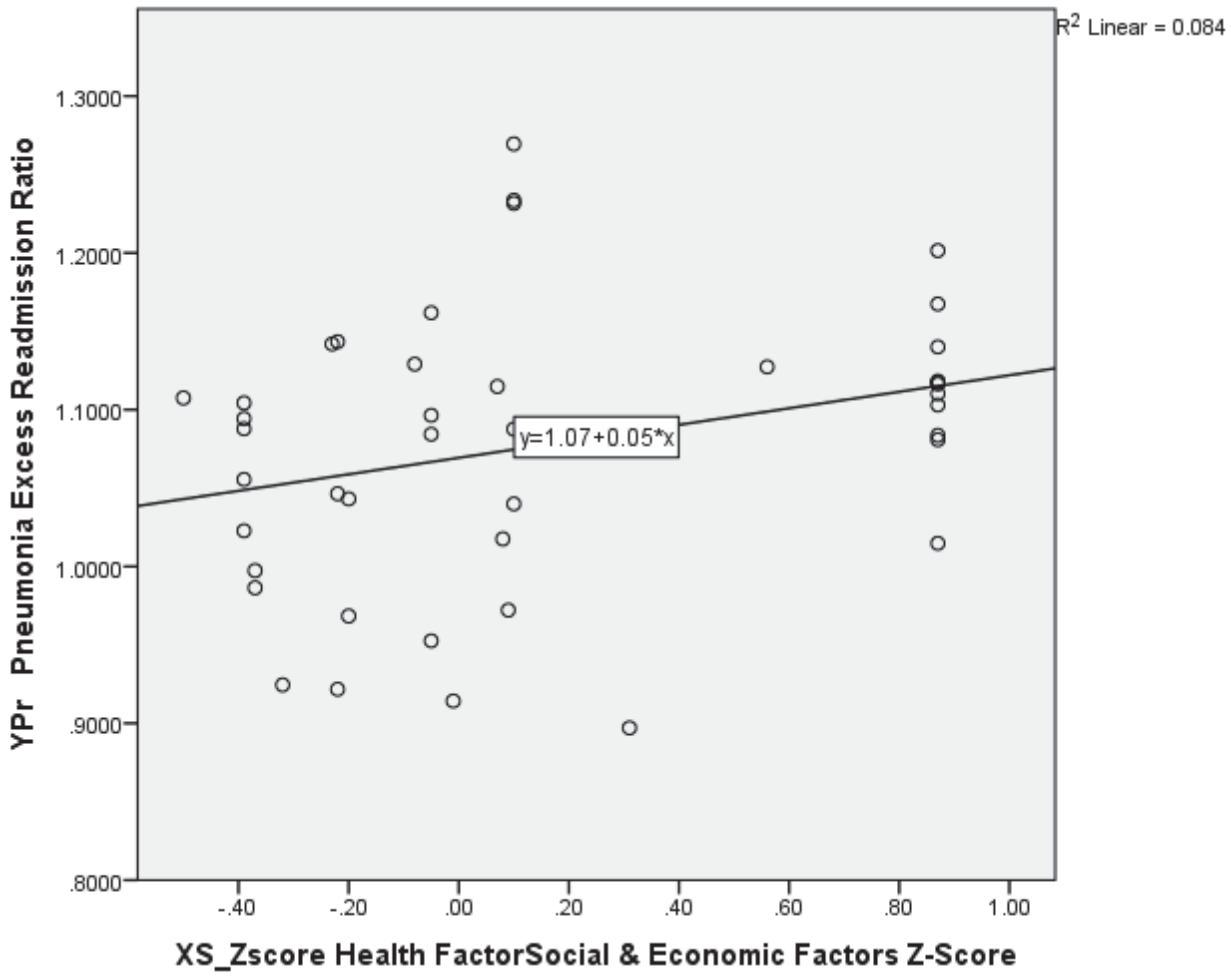

R2 Linear = 0.049
Yar Acute Myocardial Infarction Excess Readmission Ratio
1.2000
1.0000
.8000
.6000
.4000
.2000
.0000
y=0.89+-0.31*x
-.60
-.40
-.20
.00
.20
.40
XH_Zscore Health Factor Health Behaviors Zscore


R2 Linear = 3.426E-4
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.05+4.55E-3*x
-.60
-.40
-.20
.00
.20
.40
XH_Zscore Health Factor Health Behaviors Zscore


R2 Linear = 0.015
y=1.08+0.04*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
-.60
-.40
-.20
.00
.20
.40
XH_Zscore Health Factor Health Behaviors Zscore


R2 Linear = 0.038
Yar Acute Myocardial Infarction Excess Readmission Ratio
1.2000
1.0000
.8000
.6000
.4000
.2000
.0000
y=0.91+-0.16*x
-.40
-.20
.00
.20
.40
.60
.80
1.00
XS_Zscore Health FactorSocial & Economic Factors Z-Score


R2 Linear = 0.015
Yhr Heart Failure Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
y=1.05+0.02*x
-.40
-.20
.00
.20
.40
.60
.80
1.00
XS_Zscore Health FactorSocial & Economic Factors Z-Score


R2 Linear = 0.084
y=1.07+0.05*x
YPr Pneumonia Excess Readmission Ratio
1.3000
1.2000
1.1000
1.0000
.9000
.8000
-.40
-.20
.00
.20
.40
.60
.80
1.00
XS_Zscore Health FactorSocial & Economic Factors Z-Score

Appendix K: Coefficient Tables

Table K1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-6.071	23.084		-.263	.797	-55.942	43.799					
	XCa2 Primary care physicians	.005	.004	.458	1.155	.269	-.004	.013	.252	.305	.163	.127	7.890
	XCa3 Dentist Rate	.003	.007	.198	.510	.619	-.011	.018	.290	.140	.072	.132	7.581
	XCa4 Could not see doctor	-.180	.078	-1.268	-2.296	.039	-.349	-.011	-.228	-.537	-.324	.065	15.289
	XCb1 Preventable hospital stays rate	.009	.018	.394	.520	.612	-.030	.049	-.042	.143	.073	.035	28.797
	XCb2 Diabetic screening	.017	.117	.119	.148	.884	-.235	.269	-.051	.041	.021	.031	32.155
	XCb3 Mammography screening	-.087	.054	-.898	-1.602	.133	-.205	.030	-.149	-.406	-.226	.063	15.782
	XHa1 Excessive drinking	-.041	.105	-.349	-.394	.700	-.268	.186	-.143	-.109	-.056	.025	39.458
	XHd2 Physical inactivity	.111	.114	1.406	.977	.347	-.135	.358	-.196	.261	.138	.010	103.972
	XOq1 Low birth weight	.000	.269	.002	.002	.999	-.582	.583	.157	.000	.000	.027	36.910
	XPb1 Access to recreational facilities	.120	.044	1.412	2.718	.018	.025	.215	-.017	.602	.384	.074	13.545
	XPb2 Limited access to healthy foods	.152	.068	1.301	2.216	.045	.004	.299	.011	.524	.313	.058	17.280
	XPb4 Commuting alone	.047	.031	.980	1.506	.156	-.020	.114	-.081	.385	.213	.047	21.216
	XPe1 DailX fine particulate matter	-.038	.955	-.027	-.040	.969	-2.102	2.026	.040	-.011	-.006	.042	23.942
	XPe2 Drinking water safety	.077	.048	.866	1.610	.131	-.026	.179	-.378	.408	.227	.069	14.499
	XSe1 High school graduation	-.016	.034	-.258	-.472	.645	-.091	.058	-.081	-.130	-.067	.067	14.957
	XSf2 Children in single parent households	-.046	.067	-1.093	-.689	.503	-.190	.098	-.029	-.188	-.097	.008	126.281
	XSu1 Unemployment	-.133	.143	-.608	-.935	.367	-.441	.175	-.291	-.251	-.132	.047	21.209
	XSu3 High housing costs	.256	.070	3.229	3.651	.003	.105	.408	.187	.712	.516	.025	39.225
	XSv1 Violent crime rate	-.001	.001	-.864	-1.022	.325	-.004	.002	.028	-.273	-.144	.028	35.847

a. Dependent Variable: Yar Acute Myocardial Infarction Excess Readmission Ratio

Table K2

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.108	5.710		.194	.849	-11.228	13.445					
	XCa2 Primary care physicians	-.001	.001	-.310	-.628	.541	-.003	.001	.030	-.171	-.111	.127	7.890
	XCa3 Dentist Rate	.001	.002	.234	.483	.637	-.003	.004	.146	.133	.085	.132	7.581
	XCa4 Could not see doctor	-.037	.019	-1.324	-1.922	.077	-.079	.005	-.023	-.470	-.338	.065	15.289
	XCb1 Preventable hospital stays rate	.000	.004	-.084	-.089	.931	-.010	.009	-.092	-.025	-.016	.035	28.797
	XCb2 Diabetic screening	-4.9E-05	.029	-.002	-.002	.999	-.062	.062	-.134	.000	.000	.031	32.155
	XCb3 Mammography screening	.011	.013	.592	.847	.412	-.018	.040	-.252	.229	.149	.063	15.782
	XHa1 Excessive drinking	.017	.026	.735	.665	.518	-.039	.073	-.250	.181	.117	.025	39.458
	XHd2 Physical inactivity	.000	.028	-.016	-.009	.993	-.061	.061	-.180	-.003	-.002	.010	103.972
	XOq1 Low birth weight	.109	.067	1.742	1.629	.127	-.035	.253	.307	.412	.287	.027	36.910
	XPb1 Access to recreational facilities	-.004	.011	-.243	-.376	.713	-.028	.019	-.202	-.104	-.066	.074	13.545
	XPb2 Limited access to healthy foods	.012	.017	.526	.718	.485	-.024	.049	-.064	.195	.126	.058	17.280
	XPb4 Commuting alone	-.003	.008	-.269	-.331	.746	-.019	.014	-.412	-.091	-.058	.047	21.216
	XPe1 DailX fine particulate matter	-.013	.236	-.049	-.057	.956	-.524	.497	.026	-.016	-.010	.042	23.942
	XPe2 Drinking water safety	.012	.012	.685	1.021	.326	-.013	.037	-.133	.273	.180	.069	14.499
	XSe1 High school graduation	-.020	.009	-1.635	-2.401	.032	-.039	-.002	-.289	-.554	-.423	.067	14.957
	XSf2 Children in single parent households	-.013	.017	-1.585	-.801	.438	-.049	.022	.059	-.217	-.141	.008	126.281
	XSu1 Unemployment	.046	.035	1.052	1.297	.217	-.030	.122	-.328	.338	.228	.047	21.209
	XSu3 High housing costs	.022	.017	1.410	1.278	.224	-.015	.060	.285	.334	.225	.025	39.225
	XSv1 Violent crime rate	.000	.000	-1.554	-1.473	.164	-.001	.000	.091	-.378	-.259	.028	35.847

a. Dependent Variable: Yhr Heart Failure Excess Readmission Ratio

Table K3

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1 (Constant)	2.650	6.282		.422	.680	-10.922	16.222					
XCa2 Primary care physicians	.001	.001	.293	.713	.488	-.002	.003	.043	.194	.104	.127	7.890
XCa3 Dentist Rate	-.004	.002	-.806	-2.002	.067	-.008	.000	.119	-.486	-.293	.132	7.581
XCa4 Could not see doctor	-.018	.021	-.488	-.853	.409	-.064	.028	.336	-.230	-.125	.065	15.289
XCb1 Preventable hospital stays rate	.001	.005	.136	.173	.865	-.010	.011	-.171	.048	.025	.035	28.797
XCb2 Diabetic screening	-.077	.032	-2.005	-2.419	.031	-.145	-.008	-.533	-.557	-.354	.031	32.155
XCb3 Mammography screening	.031	.015	1.232	2.122	.054	-.001	.063	-.334	.507	.310	.063	15.782
XHa1 Excessive drinking	.017	.029	.537	.584	.569	-.045	.078	-.411	.160	.085	.025	39.458
XHd2 Physical inactivity	-.004	.031	-.185	-.124	.903	-.071	.063	-.074	-.034	-.018	.010	103.972
XOq1 Low birth weight	.191	.073	2.315	2.607	.022	.033	.350	.500	.586	.381	.027	36.910
XPb1 Access to recreational facilities	-.003	.012	-.114	-.212	.835	-.028	.023	-.184	-.059	-.031	.074	13.545
XPb2 Limited access to healthy foods	.006	.019	.191	.315	.758	-.034	.046	.083	.087	.046	.058	17.280
XPb4 Commuting alone	.003	.008	.222	.330	.746	-.015	.021	-.380	.091	.048	.047	21.216
XPe1 DailX fine particulate matter	.086	.260	.236	.331	.746	-.476	.648	-.152	.091	.048	.042	23.942
XPe2 Drinking water safety	.000	.013	-.019	-.034	.973	-.028	.028	-.314	-.010	-.005	.069	14.499
XSe1 High school graduation	-.009	.009	-.541	-.957	.356	-.029	.011	-.422	-.257	-.140	.067	14.957
XSf2 Children in single parent households	-.032	.018	-2.888	-1.758	.102	-.071	.007	.395	-.438	-.257	.008	126.281
XSu1 Unemployment	.089	.039	1.545	2.295	.039	.005	.173	.003	.537	.335	.047	21.209
XSu3 High housing costs	.042	.019	1.991	2.174	.049	.000	.083	.549	.516	.318	.025	39.225
XSv1 Violent crime rate	-.001	.000	-2.082	-2.379	.033	-.002	.000	.347	-.551	-.348	.028	35.847

a. Dependent Variable: YPr Pneumonia Excess Readmission Ratio

Appendix L: Coefficient Tables: Modified Regressions

Table L4

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.260[a]	.068	-.002	.3973989

a. Predictors: (Constant), XPb2 Limited access to healthy foods, XPb1 Access to recreational facilities, XCa4 Could not see doctor

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.457	3	.152	.965	.418[b]
	Residual	6.317	40	.158		
	Total	6.774	43			

a. Dependent Variable: Yar Acute Myocardial Infarction Excess Readmission Ratio

b. Predictors: (Constant), XPb2 Limited access to healthy foods, XPb1 Access to recreational

Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.561	.511		3.056	.004					
	XCa4 Could not see doctor	-.050	.031	-.326	-1.583	.121	-.218	-.243	-.242	.549	1.823
	XPb1 Access to recreational facilities	-.012	.018	-.141	-.692	.493	.072	-.109	-.106	.560	1.787
	XPb2 Limited access to healthy foods	.014	.021	.104	.673	.505	.061	.106	.103	.971	1.029

a. Dependent Variable: Yar Acute Myocardial Infarction Excess Readmission Ratio

Table L5

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.356[a]	.127	.084	.0667421

a. Predictors: (Constant), XSe1 High school graduation, XCa4 Could not see doctor

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.027	2	.013	2.976	.062[b]
	Residual	0.183	41	.004		
	Total	0.209	43			

a. Dependent Variable: Yhr Heart Failure Excess Readmission Ratio

a. Predictors: (Constant), XSe1 High school graduation, XCa4 Could not see doctor

Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.470	.196		7.514	.000					
	XCa4 Could not see doctor	-.009	.006	-.324	-1.423	.162	.089	-.217	-.208	.411	2.436
	XSe1 High School Graduation	-.004	.002	-.538	-2.362	.023	-.289	-.346	-.345	.411	2.436

a. Dependent Variable: Yhr Heart Failure Excess Readmission Ratio

Table L6

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.621[a]	.385	.266	.0737119

a. Predictors: (Constant), XSv1 Violent crime rate, XCa3 Dentist Rate, XCb3 Mammography screening, XSu1 Unemployment, XSu3 High housing costs, XCb2 Diabetic screening, XOq1 Low birth weight

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.123	7	.018	3.226	.009[b]
	Residual	.196	36	.005		
	Total	.318	43			

a. Dependent Variable: YPr Pneumonia Excess Readmission Ratio

b. Predictors: (Constant), XSv1 Violent crime rate, XCa3 Dentist Rate, XCb3 Mammography screening,

Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	1.854	.904		2.051	.048					
	XCa3 Dentist Rate	.000	.001	.030	.165	.870	.002	.027	.022	.522	1.917
	XCb2 Diabetic screening	-.016	.010	-.521	-1.597	.119	-.537	-.257	-.209	.160	6.231
	XCb3 Mammography screening	.003	.005	.116	.536	.595	-.391	.089	.070	.364	2.744
	XOq1 Low birth weight	.016	.019	.376	.816	.420	.438	.135	.107	.080	12.443
	XSu1 Unemployment	.003	.010	.072	.300	.766	.184	.050	.039	.295	3.394
	XSu3 High housing costs	.007	.005	.450	1.511	.140	.543	.244	.197	.193	5.187
	XSv1 Violent crime rate	.000	.000	-.769	-1.523	.137	.352	-.246	-.199	.067	14.928

a. Dependent Variable: YPr Pneumonia Excess Readmission Ratio

Curriculum Vitae

Camille Rose Bash

Career Profile:
I am a financial leader within the healthcare industry with over 30 years of progressively more challenging roles in the finance and information technology divisions. I have advanced degrees and certifications that support my financial and managerial experiences. I plan to use my educational background and my work experiences to improve upon the healthcare systems in my hospital, county, state, and nation.

Licenses and Accreditations:

2003 Licensed Nursing Home Administrator
1995 FHFMA Fellow in the Healthcare Financial Management Association
1995 CMPA Certified Manager of Patient Accounting
1992 Certified Public Accountant (CPA)

Education:

2013 PhD – Public Policy and Administration, Walden University
2001 University of Maryland – Nursing Home Administration Coursework
1990 Howard County Community College – CPA Track
1980 MBA University of Missouri at St. Louis
1978 MA in Healthcare Administration Webster University, Missouri
1975 BBA University of Texas at Austin

Professional Experience:

VP Finance/CFO/Treasurer Positions:

Doctors Community Hospital, A 205 bed acute care hospital in Lanham, Maryland
Responsible for the Finance and Informational Systems of a $220 million hospital that includes eight affiliates delivering inpatient and outpatient services to the Prince George's County residents.

Catholic Charities of the Archdiocese of Washington, DC
Responsible for the Finance and Informational Systems of a $57 million social service organization delivering social service programs to the Maryland and DC communities through 1000 employees and eleven related entities.

MedLINK Hospital and Nursing Center, Washington, DC
Responsible for the Finance and Informational Systems of a 60 bed long term acute hospital and 117 bed nursing home mainly serving the Medicare, Medicaid, and charitable patients of the community since 1992.
The Washington Home and Community Hospices, Washington, DC

A 192 bed nursing home, 9 bed hospice unit, and Hospice program of 220 patients residing in DC, Maryland and Virginia

Mary Immaculate Hospital (110 Beds), Newport News, Virginia
Responsible for the Financial Services of a 110 bed religious community hospital.

Chief Operating Officer/Administrator/Corp Compliance Officer
MedLINK Hospital and Nursing Center, Washington, DC
A 60 bed long term acute hospital and 117 bed nursing home mainly serving the Medicare, Medicaid, and charitable patients of the community since 1992.

Relevant Financial Experience:
Children's National Medical Center, Washington, DC
Responsible for Business Operations of a 250 bed teaching children's hospital with a large multi-state outpatient focus. Responsible to the Senior Vice President for the organizing, planning, directing, and evaluating the hospital's financial functions.

Eastern Virginia Medical Authority, Norfolk, Virginia
Responsible to the Director of Finance for the accomplishment of the fiscal affairs throughout the Authority, to include the direct management of payroll, accounts payable, general accounting and student receivables

R.E. Thomason General Hospital, El Paso, Texas
Responsible for Finance and Information Technology in a 300 bed county teaching hospital and outpatient facility.

The Jewish Hospital of St. Louis, Missouri
A 300 bed teaching hospital and outpatient facility within the Washington University Medical Center.

Washington University, Department of Internal Medicine
Managed Accounts Receivable for a department of Washington University School of Medicine within the Washington University Medical Center.

Texas Tech University Hospital, Lubbock, Texas
Responsible for Accounting at the university with a medical plan, that included the department of family practice in 1977.

West Texas Council of Governments, El Paso, Texas
As Senior Accountant, prepared the financials for this governmental organization responsible for the administration of city grants.

Relevant Skills and Software Proficiencies:
Public speaker, Microsoft Excel, Work, PowerPoint, HCI Financial Reporting, SPSS, Meditech 6.0, Great Plains, ADP payroll, ADP E-time, Kwik Tag Scanning, Microsoft - FRx Financials and Forecaster Budgeting and Partner for Accounting Systems, Advanced Answers on Demand for Long Term Care, Assisted Living and Hospice, Suncoast for Hospice Clinical and Accounts Receivable Management, other hospital accounting systems, including HBOC, HBO, McKesson, IBM, SMS, MCSI.

Miscellany

2013	Chairman of CFO Collaboration, HCNCA
2012-14	Maryland Chapter of the Healthcare Financial Management Association – Director
2002-03	Healthcare Financial Management Association – UK/US Exchange Member
2002-03	District of Columbia Certificate of Need Board Candidate
2001	Healthcare Financial Management Association – National Nominating Committee
2000-04	DC Healthcare Association – Payment for Services Committee Chairman
2000	Healthcare Financial Management Association - Chapter Liaison Representative
1998	Healthcare Financial Management Association - National Advisory Council
1997	Washington, DC Chapter of the Healthcare Financial Management Assoc. - President
1997	Saint User Group (HBOC) - Finance Chair
1995	The Matrix Group - Consultant
1990-91	Howard Community College, CPA Certification Program - Honor Student
1989-90	Control Data Systems Board Member - Vice President
1983-86	National Association of Accountants - Vice President
1982-84	El Paso Chapter of the Healthcare Financial Management Assoc. – Sec-Treasurer/VP/Pres
1983-84	Reserve Officers' Association Ladies - President, El Paso Chapter
1978-04	Medical Group Management Association - Member
1977-11	Healthcare Financial Management Association - Member