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The Impact of Parents Having Health Insurance on Their Children's Health Care

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The Impact of Parents Having Health Insurance on Their Children's Health Care

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Abstract of the Dissertation

This study examines the impact of parents having health insurance on their children's health care in Kentucky. Child health insurance status and child a usual source of medical care are the two health care measures analyzed. The author builds on prior research that indicated more children would become insured if parents had access to affordable health insurance options. Through the implementation of the ACA in 2014, Kentucky expanded Medicaid eligibility to low-income adults up to 138% of the federal poverty level (FPL) and offered discounts on private health insurance plans for families in certain income thresholds (Goodnough, 2015). The researcher analyzed data obtained from a web-survey completed by a random sample of Kentucky parents about one child ages 0 to 17 living in their household. Overall, 97.5% of children and 92.9% of parents were insured. Parent health insurance status was the best predictor of child health insurance status; children with uninsured parents were 31.76 times more likely to be uninsured than children with insured parents, after controlling for other factors, 95% CI, [12.77, 78.99], n = 1,179. Children with uninsured parents were no more likely to lack a usual source of medical care than children with insured parents in adjusted models. This study shows that providing affordable health insurance options to parents and children leads to most obtaining health insurance coverage. Furthermore, when affordable health insurance options are expanded for parents, additional children are likely to obtain health insurance coverage, even if children's health insurance options do not change. This study implies that parent health insurance status becomes less important for children's access to health care when most children and parents have health insurance. As changes to the health care system are discussed in Kentucky and at the federal level, policymakers should analyze how children could be impacted by potential changes, especially if those changes affect their parents.

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Chapter 1: Introduction

The health of children impacts overall child well-being and has profound implications for child development and adulthood. Children who suffer from health problems such as asthma, visual impairment, and ADHD (Attention Deficit Hyperactive Disorder) are more likely to experience difficulty learning and are less likely to perform well in school (Basch, 2011). Health is especially important in the early years as healthy young children are more likely to be healthy and earn more as adults (Rossin-Slater, 2015). The United States has progressed in child health outcomes over the past century such as reducing infant mortality rates; however, the United States still ranks poorly among other developed counties on this indicator. Across Europe, the average infant mortality rate is 4.2 per 1,000 compared with 6.2 in the United States (Rosenbaum & Blum, 2015). In the last four decades, the United States has experienced an increase in the number of children with a chronic health condition such as obesity, asthma and ADHD (Perrin, Bloom, & Gortmaker, 2007). Many of these child health conditions translate into adult health conditions that are costly to the health care system and the economy in lost work productivity (Perrin et al., 2007).

The social determinants of health (SDH) framework describes the many social and financial factors that influence health including culture, income, race, and geography (Marmot & Wilkinson, 2005). Research supports the SDH framework as highlighted by the World Health Organization (Solar & Irwin, 2010). As an example, children living in families with low-incomes experience worse health outcomes than children living in families with higher-incomes (Shore-Sheppard, 2010). According to Berger and Font (2015), children in families with lower-incomes are more likely to experience barriers to accessing quality health services that address health needs. These children are also more likely to live in areas with limited health care

resources such as access to medical providers. Research indicates that children living in poverty are less likely to have a usual source of medical care and are more likely to have difficulty obtaining needed health care than other children (Shi & Stevens, 2005).

Research supports inequities in child health outcomes based on other SDH factors such as race. Shi and Stevens (2005) found that race was a significant predictor of child health status and access to health care on several measures. A 2007 study found that while socioeconomic status accounted for a substantial portion of health disparities, race alone was a significant predictor of health outcomes. Minority children exhibited poorer overall health status and experienced more health problems than White children (Wen, 2007).

Notwithstanding these factors that influence child health, research supports the importance of children having health insurance and access to health care to promote positive child health outcomes. In a review of several studies related to children's health care, Leininger and Levy (2015) found that child access to health care primarily due to having continuous health insurance coverage reduced child mortality rates and increased the health status of children on several indicators. Authors of another systematic review found that a usual source of medical care for children other than the emergency room, labeled as a medical home, resulted in better overall child health, reduced health disparities, and an increase in utilization of needed health services among children (Starfield & Shi, 2004).

Research has shown that health insurance helps children access needed health care. Cassedy, Fairbrother, and Newacheck (2008) found that compared to children who were continuously insured through private health insurance, children who experienced lapses in health insurance coverage or who were continuously uninsured were significantly more likely to lack a usual source of medical care other than the emergency room. They were also less likely to

receive preventive health care and more likely to have unmet health care needs. Cummings, Lavarreda, Rice, and Brown (2009) found that the longer children were uninsured during a year, the less likely they were to have a usual source of medical care or receive a preventive health exam in that year. They also found that children with continuous public health insurance coverage were significantly more likely to have a usual source of medical care than children with lapses in health insurance coverage. Skinner and Mayer (2007), in a systematic review, found that uninsured children were less likely to access needed pediatric specialty care than insured children.

Health insurance coverage for children became a public policy focus starting in the 1980s. Through a series of federal policy actions beginning in 1986, states were required to provide Medicaid coverage to children under age 6 up to 133% of the Federal Poverty Level (FPL) and by 1990, up to 100% FPL for children ages 6 to 14 (Howell & Kenney, 2012). Holly and Gitterman (2009) noted that a failed attempt at federal health care reform in 1994 brought the issue of high rates of uninsured children and the resulting negative impact on children's health outcomes to the forefront of public debate. In 1997, Congress enacted the State Children's Health Insurance Program (SCHIP or CHIP) to help more uninsured children have affordable health insurance options. Most children eligible for CHIP did not have access to health insurance through their parents' employers, but their family incomes were too high for them to qualify for Medicaid (Institute of Medicine, 1998). CHIP allowed states to provide public health insurance to children with a higher federal matching rate than Medicaid and gave states flexibility to design their own programs (Kenney & Chang, 2004).

The rate of uninsured children in the United States significantly dropped after the implementation of expanded Medicaid and CHIP for children. Dubay and Kenny (2009) found

that between 1997 and 2002, there was a 14 to 20 percentage point increase in public health insurance coverage (Medicaid or CHIP) of children and a 7 to 13 percentage point decrease in uninsured children.

Statement of the Problem

Aside from gains, children remain uninsured across the United States. According to the U.S. Census Bureau American Community Survey, 4.8% of children in the United States were uninsured in 2015, which was approximately 3.5 million children. The Kaiser Commission on Medicaid and the Uninsured contends that the majority of uninsured children in the United States are eligible for public health insurance through Medicaid or CHIP (Rudowitz, Artiga, Damico, & Garfield, 2016). Many children also face barriers to accessing needed health care. For example, about 4% of children in the United States lacked a usual source of medical care in 2013 (Federal Interagency Forum on Child and Family Statistics, 2013) and about 2.5 million children had an unmet medical need in the past year in 2011/2012 (National Center for Health Statistics at the Centers for Disease Control and Prevention, 2012).

Even during early implementation of Medicaid and CHIP for children, researchers and policymakers knew eligibility for public health insurance coverage alone would not result in all children obtaining health insurance and accessing needed health care. Experts began examining other factors that influence a child's enrollment in health insurance coverage and access to health care, including the role of their parents. Berger and Font (2015) outlined that families influence child health in three main ways including genetics (or nature), behavioral investments (or nurture) and financial investments. Even before children are born, parents make decisions regarding investment in their children's health. For example, investment in prenatal care impacts birth outcomes and outcomes for the child later in life (Institute of Medicine, 2002). Wealthier

parents generally have more available resources to invest in their children's health than parents living in poverty (Berger & Font, 2015). In a similar way, parents who achieved higher levels of education may have more knowledge and aptitude to make good decisions regarding their children's health.

Children rely on their parents to provide for their health needs including enrolling them in health insurance and ensuring they receive needed health care services. Research has found a positive relationship between health care utilization of parents and their children (Institute of Medicine, 2002). For example, Halfon (1986) found that when mothers utilized health care services, their children were significantly more likely to utilize health care, defined by a visit to a doctor in the past year. Another study found that health care utilization of parents was a significant predictor of their children's health care utilization (Hanson, 1998). Minkovitz, O'Campo, Chen, and Grason (2002) found a strong positive relationship between maternal and child health care utilization including doctor visits, emergency room visits, hospitalizations, and mental health visits. Another study found a positive correlation between parents and their children having a usual source of medical care (DeVoe et al., 2011). The same study found that when parents lack a usual source of medical care, their children are more likely to experience gaps in health insurance coverage and have unmet health care needs. Additional studies have suggested that uninsured parents are less likely to seek health care for their children even if their children have health insurance (Institute of Medicine, 2002).

During the same time of expansions of public health insurance for children, many low-income parents had limited or no affordable health insurance options. Low-income parents typically did not qualify for Medicaid, and their employers did not offer employer-sponsored insurance (DeVoe, Tillotson, Angier, and Wallace, 2014). In 2000, the average Medicaid

eligibility for low-income parents across the United States was 60% FPL, which was an income of about $10,000 for a family of four (Ku & Broaddus, 2000). The rate of uninsured parents increased from 13.6% in 1998 to 17.1% in 2009, as noted by DeVoe, Tillotson, Angier, and Wallace (2014).

The documented relationship between parent and child health care utilization caused researchers to begin to explore the relationship between parent health insurance status and child health insurance status as a potential explanation of why children with affordable health insurance options such as Medicaid or CHIP remained uninsured. The premise was that if states offered more affordable health insurance options to parents, additional children would become insured and access needed health care. Research is limited with 15 studies examining the impact of parent health insurance status on children's health care since 2000. Of the studies, research has consistently found that when parents have health insurance, their children are more likely to have health insurance (DeVoe, Crawford, et al., 2015; DeVoe, Krois, Edlund, Smith, & Carlson, 2008a, 2008b; Dubay & Kenney, 2003; Guendelman & Pearl, 2004; Guendelman, Wier, Angulo, & Oman, 2006; Ku & Broaddus, 2000; Yamauchi, Carlson, Wright, Angier, & DeVoe, 2013). Research has also found that when parents have health insurance, their children are less likely to experience lapses in health insurance coverage (DeVoe, Tillotson, Angier, & Wallace, 2015; DeVoe, Krois, et al, 2008a; DeVoe, Tillotson, & Wallace, 2009; Guendelman & Pearl, 2004; Guendelman et al., 2006; Sommers, 2006).

Research is mixed on the impact of parent health insurance status on access to health care for children including measures of usual source of medical care, unmet health care needs, and delayed or missed care. Three out of four studies found that children were significantly more likely to have a usual source of medical care if their parents were insured (DeVoe et al., 2009;

Guendelman & Pearl, 2004; Guendelman et al., 2006). Davidoff, Dubay, Kenney, and Yemane (2003) found a positive, though statistically non-significant, relationship between parent health insurance status and child usual source of medical care among insured children. One of three studies found that children were more likely to have unmet health care needs if their parents were uninsured (DeVoe et al., 2009), and one of two studies found that children with uninsured parents were more likely to experience delayed or missed care than children with insured parents (Wisk & Witt, 2012).

Research is also mixed on the impact of parent health insurance status on health care utilization among children including receipt of preventive health care and medical visits. Two of four studies found a significant positive relationship between parents having health insurance and children receiving preventive care (Davidoff et al., 2003; Gifford, Weech-Maldonado, & Short, 2005). In addition, of four studies that examined the relationship between parent health insurance status and child medical visits, only Davidoff et al. (2003) found a significant relationship.

Although research exists on the connection between parent health insurance status and children's health care most studies used data prior to 2014. These were narrow in scope due to limited affordable health insurance options for low-income parents in most states. A new opportunity to cover more parents began with the passage of the Patient Protection and Affordable Care Act (ACA) in 2010. This federal health care reform law included new health insurance options for low-income adults previously not available, specifically expanding Medicaid to low-income adults up to 138% FPL. In addition, new health insurance exchanges offered discounts on private health insurance plans for families with incomes from 100% to 400% FPL. Several states challenged the federal government's authority to require them to

expand Medicaid coverage to low-income adults, and a 2012 United States Supreme Court ruling changed the requirement of Medicaid expansion for low-income adults to be optional for states. As of January 2017, 32 states and the District of Columbia had expanded Medicaid (Kaiser Family Foundation, 2017). Some states chose to expand Medicaid on the original implementation date in January 2014, while others expanded at a later date. According to the ACA, Medicaid was 100% federally funded from 2014 through 2016 with states paying a portion of the cost beginning in 2017.

The future of health care in the United States is uncertain. The newly inaugurated President and both chambers of Congress have committed to repealing the ACA and replacing it with a different health reform law. The health care system, including health insurance options, will likely change in the coming months and years. These changes have the potential to impact children and their families positively or negatively, and this study can help inform those policy decisions.

Purpose of Study

Given the current political dynamics at play, the opportunity exists to reexamine the impact of parents having health insurance on children's health care in a state that expanded Medicaid for low-income parents. This study provides important information about the relationship between parents and their children in the health care arena for policymakers, government officials, health care professionals, and other stakeholders in Kentucky and across the United States. Kentucky was considered a national model for implementation of the ACA, including expanding Medicaid to low-income parents up to 138% FPL in January 2014 and creating a state-based health insurance exchange, kynect (Goodnough, 2015). Kentucky's rate of uninsured individuals saw one of the largest drops in the nation, and other states and the federal

government have examined Kentucky for lessons learned (Witters, 2016). The political climate in Kentucky and in the federal government have changed since Kentucky's implementation of the ACA. Kentucky's Governor, elected in November 2015, has made changes to Kentucky's implementation of health care reform such as shutting down its state-based health insurance change, kynect. Additional changes, specifically in the Medicaid program are also being proposed (Goodnough, 2015). The federal government will seek changes to the health care system, including replacing the ACA. As potential changes are analyzed in Kentucky and at the federal level, especially changes that will impact health insurance options for parents, it is important to evaluate how proposed changes could impact families with children.

The purpose of this study is to examine the impact of parents having health insurance on their children's health care. In this study, two measures of children's health care are analyzed including children having health insurance and children having a usual place they go to for medical care (termed "usual source of medical care"). The following research questions are addressed:

- What impact does parents' health insurance status have on their children's health insurance status?
- What impact does parents' health insurance status have on their children having a usual source of medical care?

Study Overview

The behavioral health services use model offered by Anderson (1968) is a widely used theory on health care utilization and was the framework for this study. According to this model, individuals' use of health care is influenced by three sets of factors: predisposing, enabling and need. Predisposing factors include demographic and social structure characteristics such as age,

gender, family structure, race and education. Enabling factors include financial and structural characteristics such as income, health insurance, having a usual source of medical care, and transportation. The need component of the model refers to health status or illness.

In this study, the key variable of interest was parent health insurance status, which was identified as a potential enabling factor. The primary outcome variables, child health insurance status and child usual source of medical care, were also enabling factors. The study included additional predisposing, enabling and need covariates.

This study was a single observation survey (non-experimental) design. The population of interest included children ages 0 to 17 living in the state of Kentucky and their biological or adopted parents. Utilizing an external data collection agency, a random sample was targeted for the specific demographics needed for the study which were parents with a biological or adopted child living in their household under the age of 18 in Kentucky

A web-based survey was completed by one parent in the household about one child in the household, randomly selected to be the focus of the survey. The survey captured information about the parent and child including demographic information, health insurance status, and measures of health care access and utilization. Most survey questions were adapted from the National Survey of Children's Health. Logistic regression was utilized to assess the impact of parent health insurance status on each outcome variable of interest (child health insurance status and child usual source of medical care) in unadjusted and adjusted models. In adjusted models, covariates were modeled after Guendelman and Pearl (2004) and Guendelman et al. (2006).

Assumptions

- It is assumed that parents answered the survey honestly and to the best of their abilities. Participants were informed of their anonymity and confidentiality before agreeing to take the survey.
- It is assumed the criteria of the sample was appropriate for the stated research questions and purpose of the study.

Key Terms

The following key terms are important for this study. These terms are common in health care research and health policy.

Public health insurance programs.

- Medicaid – Created through the Social Security Act of 1965, Medicaid is a joint federal and state run public health insurance program that provides free or almost free health insurance to people living with low-incomes and other vulnerable populations, including children, pregnant women, people with disabilities and certain groups of the elderly.
- State Children's Health Insurance Program (CHIP or SCHIP) – A federal and state run program to provide affordable public health insurance to children whose parents earn too much for their children to qualify for Medicaid but too little for them to afford private health insurance. In Kentucky, this program is called KCHIP.

Health insurance terms.

- Health insurance status – Health insurance status refers to whether a person is enrolled in a health insurance plan, which may be a private or public plan.
- Continuous coverage – In most studies, continuous coverage refers to a person having health insurance for 12 months without lapses, often termed "gaps," in health insurance coverage.

- Uninsurance – Uninsurance is a common term used in health care policy defined as the state of being uninsured.

Access to health care terms.

- Usual source of medical care – This is sometimes called a "medical home" but termed usual source of care or usual source of medical care and defined as a consistent place one regularly goes for medical or primary care, not including the emergency room or an urgent care clinic. For example, a child who has a specific doctor's office he or she regularly goes to for preventive and sick care would be classified as having a usual source of medical care.
- Unmet health care needs – Health problems which need treatment but remain untreated due to a variety of reasons.
- Delayed or missed care – Health care treatment that a person needs but does not receive in a timely manner due to a variety of reasons.

Health care utilization terms.

- Preventive health care – This refers to care received by a person to avoid health problems and promote positive health status such as well-child exams, immunizations, or annual wellness checkups.
- Well-child exam – This is a common measure of preventive care among children. During these visits, children receive immunizations and are checked for early detection of potential health problems.
- Medical visit – In most studies, a medical visit is defined as a visit to medical provider including a doctor, nurse practitioner or other health professional in the last 12 months. In some studies, this includes emergency room visits as well.

Additional terms.

- Patient Protection and Affordable Care Act (ACA) – Federal health care reform act signed into law in 2010, which made several changes to health insurance coverage options and the health care system in the United States.
- Federal Poverty Level (FPL) - The federal poverty level (FPL) is the determined minimum amount of gross income that a family needs for necessities including food, shelter, clothing, transportation, etc. Both household income and household size are accounted for in FPL. The United States Department for Health and Human Services determines FPL each year to adjust for inflation. Public assistance programs such as Medicaid often base eligibility limits as a determined percentage of FPL.

Chapter 2: Literature Review

Despite gains in health insurance coverage for children since expansion of Medicaid for children in the 1980s and the creation of CHIP in 1997, children remain uninsured. After CHIP was implemented, researchers found that many children without health insurance were eligible for public health insurance coverage. Although estimates varied depending on the data source and analysis utilized, between 1.1 million and 5.4 million children in the United States were predicted to be eligible for Medicaid or CHIP but had no health insurance coverage in 2007 (Dubay, 2007). The large numbers of uninsured children who were eligible for public health insurance prompted researchers to explore reasons for child uninsurance, especially among children eligible for public health insurance.

During the same time of expansions of public health insurance eligibility for children, low-income parents in the United States faced limited affordable health insurance options and the percentage of uninsured parents increased (DeVoe et al., 2014). Prior research had documented a relationship between parent and child access to and utilization of health care; therefore, researchers began to examine if children were more likely to have health insurance and access needed health care if their parents had health insurance.

This study examines the impact of parents having health insurance on their children's health care in Kentucky after ACA implementation. Kentucky was considered a national model for implementation of the ACA, including expanding Medicaid to low-income parents up to 138% FPL in January 2014 and operating a state-based health insurance exchange, kynect (Goodnough, 2015). Kentucky's rate of uninsured individuals saw one of the largest drops in the nation, and other states and the federal government have examined Kentucky for lessons learned (Witters, 2016). Prior studies mainly included parents who lacked affordable health insurance

options. This study expands the field of research to determine the impact of parents having health insurance on children's health care in a state that expanded Medicaid for low-income adults in 2014. This study provides important insight for policymakers and other stakeholders on how children could be impacted by health care policy changes being discussed in Kentucky and at the federal level. This chapter provides the theoretical and empirical context for the research questions

Health Insurance Coverage Trends in the United States

The U.S. Census Bureau American Community Survey estimates suggest the rates of uninsured children and parents have decreased since the passage of the ACA in 2010. In the United States, an estimated 4.8% of children under age 18 were uninsured in 2015, compared to 8.6% in 2009. In 2015, 30 states including Kentucky had rates of uninsured children that were lower than the national average; rates of uninsured children ranged from 1.1% in Massachusetts to 10.6% in Alaska. The South had the largest share of the uninsured children in the United States at 49.5% in 2015 (Alker & Chester, 2016). Kentucky's rate of uninsured children was 4.2% in 2015, compared to 6.3% in 2009, and the state ranked 26th in the United States for the percent of uninsured children in 2015. The ACA did not include increases in eligibility for children in public health insurance programs so the decrease in uninsured children from 2009 to 2015 is likely attributable to other factors.

The rate of uninsured parents in the United States decreased from 17% in 2009 to 12% in 2015, according to the U.S. Census Bureau American Community Survey. In 2015, the rates of uninsured parents across states ranged from 2% in Massachusetts to 24% in Texas. Kentucky's rate of uninsured parents was reduced by more than half from 2009 to 2015 as the percent of uninsured parents dropped from 18% to 7%. As noted previously, Medicaid expansion for low-

income adults up to 138% FPL, although included as a requirement in the ACA, became optional for states due to a 2012 United States Supreme Court ruling. As of January 2017, 32 states had expanded Medicaid (Kaiser Family Foundation, 2017). Estimates suggest the rate of uninsured individuals dropped more in states that expanded Medicaid than in states that did not expand Medicaid from 2013 to 2016 (Rudowitz, Artiga, & Young, 2016).

Theoretical Framework

Several theories exist to understand health care. The behavioral health services use model is a widely used health care theory and was the framework for this study. Anderson (1968) first presented the model with the purpose of expanding and integrating two theories of health service utilization including economic theory and social-psychological models. According to Anderson, economic theories related to health care utilization focused on factors that enable a person to access health services such as financial resources and health insurance while psychological models focused on the perceived need for health services. He worked to combine these two models into a new behavioral model of health care use.

Anderson (1968) contended that family use of health care services is influenced by a sequence of three factors: predisposing, enabling and need as shown in Figure 1. Predisposing factors include demographic and social structure characteristics such as age, gender, family structure, race and education. Enabling factors include financial and structural characteristics that help a family secure health care services such as income, health insurance, usual source medical of care, and transportation. The need component of the model refers to health status or illness. The model was revised in subsequent years to include additional elements such as the influence of health policy on health care use (Aday & Andersen, 1981; Andersen, 1995).

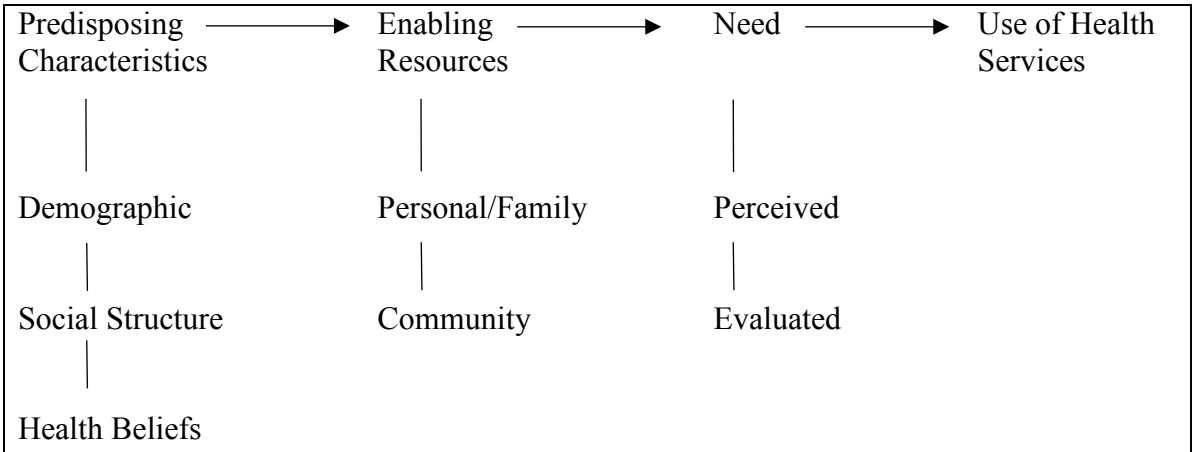

Figure 1. Behavioral health services use model proposed by Anderson (1968) to describe factors influencing a family's use of health services. Copyright © 1968.

In revisiting the model, Aday and Anderson (1974) indicated that health policy generally focuses on the components of the model that can be manipulated through policy actions which are mainly the enabling factors. Studies that have examined the impact of parents having health insurance on children's health care have used the behavioral health services use model, with particular interest to the impact of enabling factors on children's access to and utilization of health care (Davidoff et al., 2003; Gifford & Weech-Maldonado, 2005; Guendelman et al., 2006; Wisk & Witt, 2012). In this study, the predictor variable of interest is the parent health insurance status, a potential enabling factor. The outcome variables are also enabling factors and included child health insurance status and child usual source of medical care. The study included additional predisposing, enabling and need factors.

Empirical Context

The following review examines empirical studies related to the impact of parents having health insurance on children's health care. The literature search included online databases connected with the Bellarmine University Library including Ebscohost, Proquest and JSTOR.

Key terms included "child health services," "health services accessibility," "child health insurance," and "parent health insurance." The combination of "child health services," "health insurance," AND "parent" yielded 89 results and most of the 15 studies included in this review were in those results. In order to be included in this review, studies had to meet the following criteria:

- The study had to be published in the last 20 years to ensure this review focused on recent research.
- The study had to be primary research. The review included primary research of secondary data as many of the studies on this topic used extent data.
- The study had to be published in an academic journal. One study by Ku and Broaddus (2000) was primary research but was not published in an academic journal. This study is included in the literature review because it was an early analysis of the connection between parent and child health insurance status. It was also frequently cited in other studies in this literature review.
- The study had to analyze parent health insurance status as a predictor variable of interest. The outcome variables had to be related to child health insurance status, access to health care or utilization of health care.

Although this study examined two primary measures of children's health care which included child health insurance status and child usual source of medical care, this literature review includes studies that examined the impact of parents having health insurance on other measures of children's health care. The inclusion of these studies provides a more comprehensive analysis of research in the field.

The studies included in this review had similarities. Generally, studies addressed similar outcome variables of children's health care including health insurance status, continuous health insurance coverage, unmet health care needs, usual source of medical care, preventive care, and doctors' visits. Most studies focused on low-income families as a result of the expansions in public health insurance for children in the1980s and 1990s and utilized logistic regression as the primary statistical method of analysis. Several studies utilized extant data from state or national surveys. Finally, most studies included in this literature review under child health care utilization and access to health care compared insured children who had uninsured parents with insured children who had insured parents.

Impact of parent health insurance status on child health insurance status.

Research supports the importance of children having health insurance as it helps them access needed health care services and promotes overall health. Research shows that uninsured children are less likely to have a usual source of medical care, less likely to receive health care treatment, and are more likely to have unmet health care needs than insured children (Cummings et al., 2009). In addition, research suggests the longer children have continuous health insurance coverage, the more likely they are to have a usual source of medical care, receive preventive care, and visit medical providers and the less likely they are to experience unmet health care needs (Cassedy et al., 2008; Cummings et al., 2009). Even short gaps in health insurance coverage can cause children to go without needed health care (Cummings et al., 2009). Research has also found that access to health services among children, due to having health insurance, can reduce child mortality rates and improve the health status of children (Leininger & Levy, 2015).

Child health insurance status.

Studies have consistently found a positive relationship between parent and child health insurance status. Ku and Broaddus (2000) used data from the U.S. Census Bureau Current Population Survey to analyze whether offering public health insurance to more parents would impact enrollment of Medicaid-eligible children who do not have health insurance. They analyzed Medicaid participation rates among children under age 6 in families whose incomes were below 133% FPL in three groups:

- states that expanded Medicaid coverage to parents in 1994 (Hawaii, Oregon and Tennessee);
- states that expanded Medicaid coverage to parents later in the 1990's and states that created a new public health insurance option for parents (Delaware, Massachusetts, Minnesota, New York, Vermont and Washington); and
- states that implemented no broad public health insurance expansions for parents as of 1998 (all other states).

Due to public health insurance expansions for children in the 1980s and 1990s, all children in the study were deemed eligible for Medicaid or CHIP. The researchers found that states that expanded public health insurance to low-income parents in 1994 had higher Medicaid participation rates of children than states that implemented no broad expansions as of 1998. The Medicaid participation rate for eligible children increased by 16 percentage points, from 51% in 1990 to 67% in 1998 in the group of states that expanded Medicaid coverage to parents in 1994. In comparison, the participation rate for children in states that did not expand public health insurance for parents increased by only 3 percentage points, from 51% in 1990 to 54% in 1998.

Although Ku and Broaddus (2000) offered one of the earliest insights on the potential link between parent and child health insurance status among low-income families, the study had

several weaknesses. First, the researchers analyzed child Medicaid participation rates of states instead of analyzing individual child and parent pairs. In addition, higher Medicaid participation rates of children in states that expanded Medicaid could be explained by other factors unique to states that voluntarily expanded public health insurance options to parents. For example, states that expanded Medicaid to parents in 1994 might have implemented more extensive outreach and enrollment efforts for children, leading to higher child Medicaid participation rates in those states. The results would have been strengthened with the inclusion of covariates in their analysis that have been shown to influence child health insurance status such as child characteristics including gender, age, race, and health status; parent demographics including education level, and family characteristics including household income, household employment, and family structure.

Dubay and Kenney (2003) found similar results to those of Ku and Broaddus (2000) by analyzing whether expanding public health insurance eligiblity to low-income parents would increase Medicaid participation rates of eligible children. Using data from the 1997 and 1999 National Survey of America's Families, the researchers examined Medicaid participation rates of children in three groups of states:

- states that offered no public health insurance coverage to parents;
- states that offered public health insurance coverage to parents through a state-funded program (Minnesota and Washington); and
- states that offered Medicaid coverage to parents (Delaware, District of Columbia, Hawaii, Massachusetts, Missouri, Oregon, Rhode Island, Tennessee, and Vermont).

The study by Dubay and Kenney (2003) was stronger than Ku and Broaddus (2000) as Dubay and Kenney incorporated parent and child characteristics such as income and race in their

analysis. They also utilized methods to control for variations in state programs such as the quality of the program, enrollment procedures, and awareness of the program. Their research revealed that participation rates of Medicaid-eligible children were significantly higher in states that offered Medicaid coverage to low-income parents than in states that did not provide public health insurance coverage for parents, about 80.8% compared to 57.1%, respectively, $p < .05$. Child participation rates in Medicaid in states that offered public health insurance coverage to parents through a state funded program were also higher than in states that provided no public health insurance coverage, 78.5% compared to 57.1%, respectively, $p < .05$. The results suggested that providing affordable health insurance coverage to low-income parents through Medicaid or another public health insurance program could lead to an increase in enrollment of eligible children in Medicaid.

DeVoe, Krois, et al. (2008b) explored the relationship of parents' health insurance status with their children who were deemed eligible for public health insurance through Oregon's Medicaid program yet were uninsured. They analyzed a sample of 2,861 families enrolled in the food stamp program in Oregon in 2005. The study revealed that 80.8% of uninsured children had uninsured parents, compared to 25.5% of insured children with uninsured parents. When they adjusted their results for covariates including race, parental employment, and household income, they concluded that children were more likely to be uninsured if their parents were uninsured, adjusted odds ratio (AOR) = 14.21, 95% CI [9.23, 20.34]. Their findings also suggested that children were significantly more likely to be uninsured if their parents were on private insurance than if their parents were enrolled in public health insurance, AOR = 4.39, 95% CI [2.00, 9.66]. The researchers hypothesized that this could have been due to privately insured parents not knowing that their children were eligible for public health insurance.

Yamauchi et al. (2013) examined how continuous health insurance coverage of low-income parents impacted the health insurance status of their children. The researchers examined a sub-sample of participants (n = 559) who participated in the Oregon Health Care Survey conducted from 2003 to 2006, which included adults enrolled in Oregon's Medicaid program. They compared children's health insurance status at the end of a 30-month survey period with the number of months their parents had health insurance during the same time period. The authors found that the longer a parent had continuous health insurance coverage, the less likely that one of their children was uninsured at the end of the 30-month study period. The results revealed that 91.4% of parents who had health insurance for 28 to 30 months reported that all children in their household were insured at the end of the study, compared with 83.7% of parents who had health insurance for 19 to 27 months, 74.3% of parents who had health insurance for 10 to 18 months, and 70.8% of parents who had health insurance for fewer than 9 months. The results remained consistent when controlling for covariates. Compared to the reference group of parents with 28 to 30 months of health insurance, parents with the shortest amount of time covered (fewer than 9 months of the 30-month period) had the highest likelihood having an uninsured child, AOR = 7.26, 95% CI [2.75, 19.17].

Findings of DeVoe, Krois, et al. (2008b) and Yamauchi et al. (2013) supported parent health insurance status as a significant predictor of child health insurance status. One possible confounding issue with these studies is that they were conducted during a time when Oregon changed its Medicaid program for parents including lowering the income eligibility threshold and implementing cost sharing requirements. While speculation, some parents may have thought their children lost eligibility for Medicaid if they, as parents, lost eligibility. While this may not have altered the findings, results should be examined in light of this context.

DeVoe, Crawford, et al. (2015) examined the relationship between Medicaid coverage among children and parents at a time when access and eligibility of public insurance differed among children and parents. The researchers used administrative data from 2002 through 2010 from Oregon's Medicaid program, which included information for children ages 2 to 18 who had Medicaid or CHIP coverage at any point during the timeframe. To be included in the study, at least one parent and one child had to be enrolled in Oregon's Medicaid program at any time from 2002 to 2010. The sample included 138,651 households; if multiple children were in a household, the researchers included the youngest child in their analysis. The authors analyzed the strength of association between child and parent public health insurance status during five timeframes over the course of 9 years when the policy changes were implemented. The first policy change occurred in 2003 when Oregon expanded Medicaid eligibility for children to 185% FPL and implemented cost containment measures for adults. The second policy change occurred in 2008 when, through a random selection process, about 10,000 adults with incomes at or below 100% FPL were offered public health insurance coverage. The third policy change occurred in 2010 when another random selection process extended public health insurance to more low-income adults. Also in 2010, Oregon expanded CHIP eligibility for children up to 200% FPL and offered discounts on private health insurance plans for children with family incomes between 200% and 300% FPL.

The researchers found that children's enrollment in Medicaid closely mirrored that of their parents' enrollment in public health insurance over the time period. This pattern held true even when public health insurance eligibility for parents was reduced while child eligibility was expanded and when parent eligibility was expanded but child eligibility levels remained the same. For example, child coverage rates in Medicaid significantly dropped in 2003 after parent

eligibility for Medicaid was reduced even though eligibility for children was expanded at the same time. Children with at least one parent who kept or gained public health insurance coverage in a given month were more likely to be enrolled in Medicaid in that same month compared to children who had no parents covered by public health insurance in a given month. Children had significantly higher odds of being enrolled in Medicaid if their parents had public health insurance coverage during the entire study.

Strengths of the study by DeVoe, Crawford, et al. (2015) included the longitudinal observation of family health insurance patterns and the impact of policy changes on health insurance patterns. One weakness of the study was that it failed to account for children and parents who moved to private health insurance as the study only analyzed enrollment in Medicaid; however, the researchers accounted for potential family economic changes during study.

Additional studies with primary objectives of determining the impact of parent health insurance status on child access to and utilization of health care, to be discussed more in-depth in later sections of this review, also found significant positive relationships between child and parent health insurance status. Guendelman and Pearl (2004) found that uninsured children were more likely to have uninsured parents than to have insured parents. Among uninsured children, 84% had uninsured parents. Comparatively, only 3% of uninsured children had parents with public insurance and 13% of uninsured children had parents with private insurance. Similarly, Guendelman et al. (2006) found a significant relationship between child and parent health insurance status among low-income families. Among uninsured children, 72.2% had uninsured parents, 19.9% of children with public health insurance had uninsured parents, and 5.2% of privately insured children had uninsured parents, $p < .01$. After adjusting for covariates, DeVoe,

Krois, et al. (2008a) found that children were significantly more likely to be uninsured if an adult in their household had recently lost Medicaid coverage than if no adults in the household recently lost coverage, AOR = 1.44, 95% CI [1.02, 2.04]. Their study followed changes to Oregon's Medicaid program which caused many adults, including parents, to lose Medicaid coverage.

Gaps in child health insurance coverage.

All six studies included in this review that addressed continuous health insurance coverage of children found that children were more likely to experience gaps in health insurance coverage if their parents were uninsured. Guendelman and Pearl (2004) used data from the 2000 National Health Interview Survey to analyze the impact of public health insurance expansions for low-income children on their access to health care and if extending health insurance to low-income parents would further increase access to health services for children. The predictor variable included family health insurance coverage status which was broken down into three groups:

- family coverage (at least one parent in the household was insured and the child was insured);
- child-only coverage (the child was insured but no parents in the household were insured); and
- no family coverage (the parents and child were uninsured).

While there were few significant differences between children who had family coverage and children who had child-only coverage, the researchers found a significant relationship between family coverage and coverage gaps for children. Compared to children with family coverage, children with child-only coverage had a 4% higher probability of experiencing gaps in health insurance coverage, $p < .05$.

Sommers (2006) found that parent health insurance status significantly impacted children eligible for Medicaid and CHIP staying enrolled in insurance coverage. The sample (n = 11,154) came from the U.S. Census Bureau Current Population Survey March Supplement from 1999 to 2004 and included children across the United States ages 0 to 18. Only households who were in the survey for two consecutive years were included in the study. In addition, the sample only included households where the child was enrolled in Medicaid or CHIP the first year of the survey and should have remained enrolled, due to eligibility status, in the second year of the survey. The independent variables were whether the child had a parent covered by public health insurance in year 1 of the study and whether the child had a sibling covered by public health insurance in year 1 of the study, while controlling for other demographic variables. After controlling for public health insurance eligibility, parent health insurance coverage was the only significant predictor of drop-out among children. In this analysis, having a parent with public health insurance coverage led to a 75.9% reduction in drop-out for children.

DeVoe, Krois, et al. (2008a) found further support that parent health insurance status impacts lapses in child health insurance coverage in an Oregon-based study. They analyzed the impact of many low-income parents losing health insurance due to policy changes in the Oregon Medicaid program on children. The researchers hypothesized that the increase in the rate of uninsured children in the years following the policy changes was significantly associated with the increase in low-income parents becoming uninsured. Using a sample of families enrolled in the food stamp program in Oregon in 2005, the researchers found that children with parents who lost Medicaid coverage after changes in eligibility for adults were more likely to experience gaps in health insurance coverage than children whose parents maintained public health insurance coverage, AOR = 1.79, 95% CI [1.36, 2.36].

DeVoe, Tillotson, et al. (2015) found that children of parents with continuous health insurance coverage were more likely to have continuous health insurance than children of uninsured parents or children whose parents had gaps in health insurance coverage. They analyzed changes in predictors of continuous health insurance coverage for children in the United States since the implementation of CHIP in 1997. The researchers compared two years of data from the 1998 and 2009 Medical Expenditure Panel Survey with a sample of 5,879 children in 1998 and 9,125 children in 2009. Although race and child health insurance type were significant predictors of gaps in coverage, having a parent with a gap in health insurance coverage was the greatest predictor of a child having a gap in health insurance coverage in both years. Compared to children who had at least one parent with continuous health insurance coverage, children whose parents did not have continuous coverage were significantly more likely to experience a gap in coverage in 1998, relative risk (RR) = 17.96; 95% CI, [14.48–22.29] and in 2009, RR = 12.88, 95% CI, [10.41–15.93]. When the models were adjusted for covariates, continuous health insurance coverage of parents was the only significant predictor of gaps in health insurance coverage for children (with the exception of child age in 2009).

Other studies discussed in more detail in other sections of this literature review supported parent health insurance status as a predictor of gaps in child health insurance coverage. Research by Guendelman et al. (2006) showed that insured children with uninsured parents had higher odds of experiencing gaps in health insurance than insured children with insured parents, AOR = 3.6, 95% CI [2.5, 5.1]. DeVoe et al. (2009) found that insured children with uninsured parents and insured children with one insured parent and one uninsured parent had higher odds of experiencing a gap in health coverage than insured children with insured parents, OR = 2.45, 95% CI [2.02, 2.97] and OR = 2.26, 95% CI [1.79-2.85], respectively. Overall, studies have

found that when parents are uninsured, their children are more likely to be uninsured and experience gaps in health insurance coverage.

Impact of parent health insurance status on child access to health care.

Research shows that when children lack access to health care, they are less likely to receive needed health services and more likely to experience health care needs that go untreated. A usual source of medical care other than the emergency room or urgent care helps children access regular preventive health care and timely treatment when they are sick. Having a usual source of medical care has also shown to reduce health disparities among vulnerable groups and improve overall health (Bartman, Moy, & D'Angelo, 1997; Gadomski, Jenkins, & Nichols, 1998; Smith, Santoli, Chu, Ochoa, & Rodewald, 2005; Starfield & Shi, 2004). When children face barriers in accessing health care, it may cause health conditions to worsen, resulting in long-term chronic health conditions (Newacheck, Hughes, Hung, Wong, & Stoddard, 2000).

Usual source of medical care.

Guendelman et al. (2006) found that children were more likely to have a usual source of medical care when their parents were insured. The researchers analyzed a sample of children in California (n = 5,521) from the 2001 California Health Interview Survey to study the impact of child and parent health insurance status on various measures of access and utilization of health care. The predictor variable included family coverage status which was broken down into three groups:

- family coverage (at least one parent in the household was insured and the child was insured);
- child only coverage (the child was insured but no parents in the household were insured); and
- no family coverage (the parents and child were uninsured).

The researchers found that children with child-only coverage had 2.2 higher odds of lacking a usual source of care than children with family coverage, after adjusting for covariates, 95% CI [2.5, 5.1].

Other studies discussed in-depth in other sections of this review also found a significant relationship between parent health insurance status and child usual source of medical care. Guendelman and Pearl (2004) found that children with insured parents had an 8% higher probability of having their usual source of care be a doctor's office compared to children with uninsured parents, $p < .05$. DeVoe et al. (2009) found that insured children with uninsured parents had higher odds of lacking a usual source of medical care than insured children with uninsured parents, odds ratio (OR) = 1.31, 95% CI [1.10, 1.56].

Davidoff et al. (2003) was the only study that found no relationship between parent health insurance status and child ususal source of medical care. The researchers analyzed a sample of 9,339 children ages 0 to 17 living in families with incomes below 200% FPL from the 1999 National Survey of America's Families. Children included in the sample were either uninsured for an entire 12-month period or were insured with the same type of health insurance for an entire 12-month period. Children who were uninsured part of the 12 months or who switched their type of coverage during the 12 months were excluded. Parent health insurance status was determined by whether they had health insurance at the time of the survey. Usual source of medical care in this study was defined as a place the child usually goes for medical care other than the emergency room. The researchers did not find a significant relationship between parent insurance status and child usual source of medical care ($p > .10$).

Unmet health care needs.

Three studies examined the relationship between parent health insurance status and unmet health care needs of children. DeVoe et al. (2009) analyzed the impact of parent health insurance status on children's access to health care services. The sample (n = 43,509) included children ages 2 to 17 from the Medical Expenditure Panel Survey. The researchers combined data from 2002 through 2006 for the sample. Children and parents were separated into six groups based on child and parent health insurance status:

- child and parent(s) in household insured;
- child insured, one parent insured and one parent uninsured;
- child insured and parent(s) in household uninsured;
- child uninsured and parent(s) insured;
- child uninsured, one parent insured and one parent uninsured; and
- both child and parent(s) in household uninsured.

Children in single parent households could only be included in four of the six groups. A strength of this study is that it was one of the few studies to break out family health insurance patterns into more than three groups by taking into account the potential effect that having one insured parent and one uninsured parent could have on children's access to and utilization of health care. Using the primary predictor variable as parent health insurance status, the researchers included nine outcome variables in their analysis related to child health insurance coverage, access to health care and utilization of health care. In summary, the greater number of family members who were insured, the lower the odds that children experienced barriers in accessing health care. For the primary objective focused on parent health insurance status and child unmet health care needs, the researchers found that the farther the family insurance pattern deviated from the

reference group (children and parent(s) insured), the more likely a child was to experience an unmet health care need, with the greatest odds of experiencing unmet health care needs among uninsured children with uninsured parents, OR = 1.93, 95% CI [1.73, 2.15]. They also found that insured children with uninsured parents had greater odds of having an unmet health care need than insured children with insured parents, OR = 1.11, 95% CI [1.01-1.22]. Insured children with one parent insured and one parent uninsured did not have significantly higher odds of having an unmet health care need than insured children with both parents insured. This could suggest that insured children only need one parent insured to experience the positive effects on access to health care measures, but the study does not provide enough evidence to back up this claim.

Guendelman et al. (2006) and Guendelman and Pearl (2004) found no significant differences among unmet health care needs of children based on their parents' insurance status. Due to the limited evidence in the field, it is difficult to confidently say that when parents have health insurance, their children are less likely to have unmet health care needs.

Delayed or missed care.

Two studies analyzed the impact of parent health insurance status on delayed or missed health care among children. This indicator is closely related to unmet health care needs of children but these two indicators have been separately analyzed by researchers. Guendelman and Pearl (2004) found no significant relationship between parent health insurance status and delayed or missed health care among insured children, which was one of several access to care indicators examined.

Wisk and Witt (2012), on the other hand, found that in addition to the importance of health insurance for parents and children, type of insurance may impact delayed or missed health

care. They analyzed predictors of delayed health care utilization such as unmet health care needs among families with children. The sample (n =14,138) included families defined as a parent and child ages 0 to 17 using data from the 2001 to 2008 Medical Expenditure Panel Survey. The researchers found that when a child and parent were insured with the same type of insurance, the odds of delaying or foregoing health care due to cost decreased by almost 28%, $p < .05$. The findings suggested that access to health care could be improved for families if children and their parents have the same type of health insurance.

Impact of parent health insurance status on child health care utilization.

Although measures of access to health care and utilization of health care are related, utilization variables in most studies measured receipt of preventive health care such as well child-exams and health care visits including a doctor, other health provider, or the emergency room. Health care visits, especially preventive care, when used appropriately, can prevent health problems and promote positive health status of children (Janicke, Finney, & Riley, 2001). Regular health care visits are especially important for children with health problems. The American Academy of Pediatrics (2008) recommends preventive well-child exams annually for children ages 3 to 21. Before age 3, visits are recommended more often for preventive health care such as immunizations.

Preventive health care.

Gifford et al. (2005) found children on Medicaid with a parent also on Medicaid were more likely to have a well-child visit than children on Medicaid with an uninsured parent. The researchers analyzed the impact of a parent's Medicaid status on young children receiving well-child visits. The sample included 380 children ages 1 to 5 in families below 200% FPL from the 1996 Medical Expenditure Panel Survey. Most parents included in the study were mothers, 371

out of 380. The study was limited to children and parents whose health insurance status did not change during an entire year. The researchers created three groups which included:

- Medicaid pairs (child and parent were both insured through Medicaid all year);
- mixed pairs (the child had Medicaid coverage all year but the parent was uninsured all year; and
- uninsured pairs (both the child and parent were uninsured all year).

The researchers found that children enrolled in Medicaid were significantly more likely to receive a preventive exam if their parents were also on Medicaid than if their parents were uninsured. The results revealed that 62% of children on Medicaid whose parents were also on Medicaid received a well-child exam during the year, compared with 41% of children on Medicaid whose parents were uninsured, and 29% for uninsured children with uninsured parents.

Davidoff et al. (2003), referenced earlier, also found a relationship between parent health insurance status and children's receipt of a well-child exam. When adjusted for covariates, the results showed that having an uninsured parent decreased the chance the child would receive a well-child visit by 6.7 percentage points ($p < .05$)

Goedken, Urmie, and Polgreen (2014) aimed to identify predictors of a child's receipt of the recommended number of well-child exams among insured children and hypothesized that parent health insurance status would be a significant predictor. They examined a sample of 4,650 children from the 2007 Medical Expenditure Panel Survey. Children up to age 18 who were insured for an entire year and whose parents were either insured or uninsured for an entire year were included in the study. The researchers found no significant relationship with children's receipt of the recommended number of well-child exams for any age group or family income level. This study is unique to other studies analyzing well-child exams. The researchers

included parent use of health services as a covariate in the analysis, which most other studies did not consider; however, even when the researchers excluded parent health care use from the analysis, parent health insurance status was still not a significant predictor. In addition, this study analyzed children's receipt of the recommended number of well-child exams instead of whether a child received a well-child exam in the last year as most other studies did. The lack of significance could be due to the fact that parents did not know how many times the American Academy of Pediatrics recommended their child receive a well-child exam given the age of their child. Another possibility is that parent health insurance status impacts child entry into the health care system through a well-child exam but does not result in ongoing utilization of health care services for children.

DeVoe et al. (2009) found weak evidence to suggest that insured children with insured parents are more likely to receive preventive health counseling defined as a health provider advising their child about the importance of items including healthy eating, exercise, car safety including seat belt use, and bicycle helmet safety. These items were questions asked of parents in the Medical Expenditure Panel Survey. The researchers created four outcome variables which included the following:

- missing at least one of four preventive counseling items in the past 2 years;
- missing all four preventive counseling items in the past 2 years;
- never had at least one of four preventive counseling items; and
- never had any of the four preventive counseling items.

They found that insured children with all parents uninsured had greater odds of never having at least one of four of the preventive counseling items and never having all four of the preventive counseling items than insured children with both/all parents insured, OR = 1.20, 95% CI [1.04,

1.39], OR = 1.10, 95% CI [1.01, 1.21], respectively. They did not find that insured children with both/all parents uninsured had significantly higher odds of missing at least one or all preventive counseling items in the past two years than insured children with both/all parents insured, OR = 1.16, 95% CI [0.99, 1.36] and OR = 1.10, 95% CI [0.99, 1.21], respectively. While the study found significant relationships with parent health insurance status and preventive care counseling, a critique of this study is that the preventive care variables were different than other similar studies on preventive care which typically use receipt of well-child exams as the primary outcome variable. In addition, the researchers failed to account for variation in health care providers to provide the preventive health counseling items. There was no evidence suggested by the researchers that health care providers know to provide the four categories of counseling to children.

Medical visits.

The relationship between parent health insurance status and medical visits is weak in research. One study in the review of literature found a significant relationship between parent health insurance status and children's receipt of medical visits. In adjusted models, Davidoff et al. (2003) found that having an uninsured parent decreased the chance that a child would visit any medical provider, defined as a physician, nurse practitioner, midwife or physician's assistant, in the last 12 months by 6.5 percentage points ($p < .05$).

Other studies found weak or no relationships between parent insurance status and children's medical visits. DeVoe et al. (2009) found that insured children with one insured parent and one uninsured parent had higher odds of having no doctor visits in the last 12 months compared to insured children with insured parents. The odds for insured children with uninsured parents were lower than children with one insured parent and one uninsured parent, calling into

question the relationship between parent health insurance and children visiting a medical provider. Guendelman and Pearl (2004) found no significant relationships between insured children with uninsured parents and insured children with insured parents on any utilization variables including doctor and emergency room visits over the course of 12 months. Similarly, Guendelman et al. (2006) found no significant differences between insured children with uninsured parents and insured children with insured parents in regards to health care utilization such as doctor or emergency room visits over the course of a year when controlling for covariates.

Summary of Literature

Of the 15 studies examined, the relationship between parent health insurance status and child health insurance status consistently showed significance. The majority of studies that examined parent health insurance status with child access to health care indicators found a relationship, and studies that assessed the relationship between parent health insurance status with child utilization measures indicated weak or no relationship. All eight studies that examined a relationship between parent health insurance status and child health insurance status found that when parents do not have health insurance, their children are more likely to be uninsured (DeVoe, Crawford, et al., 2015; DeVoe, Krois, et al., 2008a, 2008b; Dubay & Kenney, 2003; Guendelman & Pearl, 2004; Guendelman et al., 2006; Ku & Broaddus, 2000; Yamauchi et al., 2013). Studies also consistently showed that when parents do not have health insurance, their children are more likely to have a gap in health insurance coverage (DeVoe, Tillotson, et al., 2015; DeVoe, Krois, et al, 2008a; DeVoe et al., 2009; Guendelman & Pearl, 2004; Guendelman et al., 2006; Sommers, 2006). Of the four studies that analyzed usual source of medical care, three of four found that children were more likely to have a usual source of

medical care if their parents were insured (DeVoe et al., 2009; Guendelman & Pearl, 2004; Guendelman et al., 2006). One of three studies found that children were more likely to have unmet health care needs if their parents were uninsured (DeVoe et al., 2009), and one study found children were less likely to have delayed or missed health care if they and their parents were insured and with the same type of insurance (Wisk & Witt, 2012). Two of four studies found a significant relationship between parent health insurance status and child receipt of preventive care (Davidoff et al., 2003; Gifford et al., 2005). Finally, one of four studies found a relationship between parent health insurance status and child medical visits (Davidoff et al., 2003).

Critique of Literature

In addition to observations made in the review of literature above, other critiques of the research should be noted. Research on this topic was limited, making it difficult to draw firm conclusions about the relationship of parent health insurance status with child health insurance status and access and utilization of health care. Other limitations of research include the following:

- Most of the researchers utilized extant data from already conducted surveys. These included the national Medical Expenditure Panel Survey and other statewide surveys for state based studies in Oregon and California. Although extant data provides useful insight, utilizing existing data in research poses challenges. The data was not collected with the intent to analyze the proposed research questions of the studies. In addition, the researchers may not have had all of the needed information on validity and reliability of the data from those who collected the data.

- Most studies were conducted at a time when public health insurance coverage for low-income parents was limited in most states. Uninsured parents in the studies may have lacked affordable health insurance coverage options. While observations were made about patterns of parent health insurance and children's health care, the research would have been stronger if all parents in the studies had affordable health insurance options.
- Many studies were conducted by the same researcher or group of researchers. In order to expand the field of research on this topic, other researchers should conduct similar studies to see if they find similar results.
- Although several studies examined the United States, state specific studies are limited to Oregon and California. Additional state specific studies could provide new insight by taking into account state level policies that impact eligibility and access to health care such as Medicaid managed care and enrollment and renewal procedures.

Significance of Study

Although prior studies addressed the impact of parents having health insurance status on children's health care, research is limited. Expanding on previous research, this is the only known study to examine the impact of parent health insurance status on children's health care in Kentucky. In addition, this was an early study following the implementation of the ACA in a state that expanded public health insurance options for low-income parents.

This study provides important information about the relationship between parents and their children in the health care arena for policymakers, government officials, health care professionals, and other stakeholders across the United States and in Kentucky. Kentucky was a national model for implementation of the ACA, including expanding Medicaid to low-income parents up to 138% FPL (Goodnough, 2015). Kentucky's rate of uninsured individuals saw one

of the largest drops across the nation after ACA implementation, and other states and the federal government have examined Kentucky for lessons learned (Witters, 2016). The political climate in Kentucky and in the federal government have changed, and modifications to Kentucky's health care system and the ACA are likely to occur. As potential changes are analyzed, specifically changes that will impact health insurance options for parents, it is important to evaluate how proposed changes could impact children.

Chapter 3: Methods

The purpose of this study is to examine the impact of parents having health insurance coverage on their children's health care. In this study, two measures of children's health care are analyzed including children having health insurance and children having a usual source of medical care. The following research questions are addressed:

- What impact does parents' health insurance status have on their children's health insurance status?
- What impact does parents' health insurance status have on their children having a usual source of medical care?

This study was a single observation survey, non-experimental design. Approval from Bellarmine University IRB was obtained before initiating the study.

Sample and Data Collection

The population of interest for this study included children living in the state of Kentucky and their biological or adopted parents. The required minimum sample size was determined to maintain bounds on the error of estimation of 3% or less while maintaining confidence levels of 95%. The definitional formula for powering a study for parameter estimation came from Vavra (1997), $n = (Z^2 * pq)/e^2$. The following parameters were set: Z is the critical value for associated confidence set at 1.96 for 95% confidence (Box, Hunter, & Hunter, 1978); p is the probability of outcome of interest, set at .5; and q is $1 - p$, so $q = .5$. Utilizing these values, the formula to calculate sample size was: $[(1.96)^2 (.5*.5)] / (.03)^2] = 1{,}067$. Therefore, a sample size of 1,067 would yield estimates at 95% confidence +/- 3%.

This study was administered in a web-based format. Survey methodology has rapidly changed over the last several years. Telephone surveys using random digit dialing (RDD) have

been the predominant method of survey research since the 1980s; however, challenges of RDD surveys continue to grow including issues with nonresponse bias and non-coverage bias (American Association of Public Opinion Research [AAPOR] Cell Phone Task Force, 2010). In 2016, the National Health Interview Survey found that 49.3% of households in the United States relied only on cell phones, meaning they had no landlines in their homes, a percentage which has been steadily increasing during the last few years (Blumberg & Luke, 2016).

Although researchers often incorporate cell phones into RDD surveys, sampling using cell phones creates additional challenges. Nonresponse rates in cell phone RDD are typically higher than nonresponse in landline surveys, although response rates for telephone surveys are declining overall, often into the single digits (AAPOR Cell Phone Task Force, 2010). It is more difficult to target a cell phone sample within a geographic area due to many people keeping their cell phone numbers when they move to another city, county, or state. In addition, surveys that incorporate both cell phones and landlines are subject to overlapping frames; it is estimated that 80% of United States households with landlines have one or more cell phones. Researchers can rarely account for this overlap as it is difficult to identify cell phones associated with a landline of a household. These barriers have made it increasingly difficult for researchers to target a representative sample using a telephone sample, even if cell phones are included (AAPOR Cell Phone Task Force, 2010).

Given the current challenges of telephone sampling, web-based survey research is becoming more common and accepted as a data collection method. Several large research and polling firms such as the U.S. Census Bureau are incorporating web-based data collection in their survey methods (Pew Research Center, 2015). The Pew Research Center estimated 89% of adults in the United States used the internet in 2015 compared to 14% in 1995. Research on

web-based surveys is still evolving; however, methods exist to increase the quality of web-based samples (Callegara et al., 2014). A probability, or random sample, versus a non-probability sample involving convenience or purposive sampling, has been show to increase the chances of obtaining a representative sample. In addition, technologies using multi-sourcing help increase randomization of web-based samples (Callegaro et al., 2014). Multi-sourcing involves selecting a random sample from various online sources, including propriety panels, real time publishing of survey links on selected individuals' social media profiles, and other methods of targeting a sample via the internet. Multi-sourcing can help maximize reach to obtain a representative sample (Callegaro et al., 2014).

Research has found that respondents are more likely to answer sensitive personal information truthfully in self-administered web-based surveys than in surveys with an interviewer administered either face-to-face or over the phone (Kreuter, Presser, & Tourangeau, 2008). One study found that when interviewers were present, participants were more likely to respond with answers that avoided uncomfortable interactions with the interviewers rather than responding honestly (Ye, Fulton, & Tourangeau, 2011).

Although web-based surveys have many advantages over telephone surveys, several issues must be considered when utilizing web-based surveys. Although nearly 90% of adults in the United States are internet users, there is still a coverage gap of about 10% for national web-based surveys. Web-based samples may be biased due to certain demographic groups that are more likely to use the internet and take online surveys (Pew Research Center, 2015). Attention must be given to comparing the demographics of a web-based sample to that of the population of interest. A 2015 study from the Pew Research Center found that the bias of web-based survey data due to excluding non-web users was small, except in a few categories related to political

knowledge and technology.

In this study, a web-based format was chosen incorporating several mechanisms to promote a representative sample. Utilizing an external data collection agency, a random sample was targeted for the specific demographics needed for the study which were parents living in the state of Kentucky with a biological or adopted child under the age of 18 living in their household. The data collection agency selected a random sample of parents living in Kentucky using multi-sourcing. The first source included a panel of people who had agreed to the terms and conditions of the sampling company to be contacted to participate in surveys. The second source involved partnering with publishing services to publish real-time survey links on various internet sites. This helped reach people who were not associated with the sampling company's panel. The third source came from proprietary partnerships of the sampling company. These partners provided panels of individuals they were approved to share with the sampling company. Incorporating all three of these sources maximized representation, randomization, and reach. Participation was voluntary. Participants were provided a small incentive to complete the survey based on a point structure; accumulated points could be exchanged for games played on social media or gift cards of $5 to $15.

Individuals (n=5,573) in the random sample were screened to ensure the person taking the survey was a parent living in Kentucky with at least one biological or adopted child between the ages of 0 to 17 living in the household. In total 1,502 screened individuals met the criteria for inclusion and were sent to the survey, with 1,200 completing the survey. The response rate was approximately 80%, which is high compared to typical response rates of 5% to 15% for web-based surveys (Tourangeau & Plewes, 2013). This high response rate is likely attributed to the incentive offered to participants (Pit, Vo, & Pyakurel, 2014). In households with multiple

qualifying children, one child was randomly selected to be the focus of the survey. Surveys took 15 minutes on average to complete and were administered in English.

Survey Instrument

Survey questions were adapted from the National Survey of Children's Health conducted in 2003, 2007, and 2011/2012 by the Centers for Disease Control and Prevention's National Center for Health Statistics Maternal and Child Health Branch. This nationwide survey conducted through the State and Local Area Integrated Telephone Survey program aims to monitor the health of children in the United States. A quantitative reliability coefficient is not available for the National Survey of Children's Health; however, reported efforts on reliability and validity have been documented. The National Survey of Children's Health questionnaire was initially developed over 18 months by a subset of a National Expert Panel consisting of national and state Maternal and Child Health Branch staff and other representatives from the health care field (Blumberg et al., 2005). Several questions were selected from existing national surveys. Content validity was established via expert review; potential questions were reviewed by outside experts and potential users of the data with the final questionnaire determined by the Maternal and Child Health Branch. After 2003, revisions to the survey instrument were made through a process which involved suggestions from a survey advisory committee and from data users obtained via an online survey (Blumberg et al, 2012). An expert panel reviewed the suggestions and provided recommendations on revisions. Questions with revisions were pretested prior to survey implementation. The full survey instrument underwent pretesting each time it was conducted, and changes were made to clarify any items prior to the survey launch.

Questions from the National Survey of Children's Health adapted for this study were modified to be Kentucky specific when applicable. For example, questions referring to the State

Children's Health Insurance Program incorporated Kentucky's name for that program known as the Kentucky Children's Health Insurance Program or KCHIP. The 38 item survey instrument included qualifier questions and questions about the parent and child including demographic information, health status, health insurance status, and health care access and utilization. See Appendix A for the survey instrument.

The survey instrument was pilot tested with five parents in four Kentucky counties including rural and urban areas, and revisions were made to clarify response choices based on feedback from the pilot testers. A larger pilot was then conducted using 86 participants and analyzed to identify issues with the programming or questions. No issues were identified so the full survey was launched and the data was collected in December 2016.

Two primary outcome variables of interest were included in this study. The first was the child's health insurance status, a dichotomous variable (insured, uninsured). Child health insurance status was based on the status at the time the parent took the survey. This method of classifying children as "insured" or "uninsured" is consistent with studies included in the literature review, including Guendelman and Pearl (2004) and Guendelman et al. (2006), that most closely aligned with the variables utilized in this study. The type of health insurance children had was also captured including private insurance or public insurance (Medicaid or KCHIP). Child health insurance status was included as a covariate for the second research question regarding the impact of parent health insurance status on child usual source of medical care since child health insurance status has been shown to be a significant predictor of child usual source of medical care in previous studies (Davidoff et al., 2003; Guendelman & Pearl, 2004; Guendelman et al., 2006). The second outcome variable of interest was whether the child had a usual source of medical care other than an urgent care clinic or the emergency room. This

variable was dichotomous (yes, no) and was determined based on the answers of two survey items.

The primary predictor variable of interest for both research questions was parent health insurance status. Parent health insurance status was dichotomous (insured, uninsured) and was based on the insurance status of the parent at the time of survey completion. Type of health insurance was captured including private insurance, public insurance (Medicaid), or Medicare.

The covariates analyzed in this study as shown in Table 1 focused on child characteristics (age, gender, race, health status), parent characteristics (parent education, household employment), and family characteristics (household income, English as the primary language spoken at home, household size, and parent relationship status).

Table 1

Covariates

Variable	Survey Instrument Item	Response Type/Choices
Child Age	What is the age of [child's name]?	Open-ended
Child Gender	What is the gender of [child's name]?	Multiple choice
Child Race	How do you define the race of [child's name]?	Multiple choice
Child Health Status	In general, how would you describe [child's name]'s health?	Multiple choice
Parent Education	What is the highest level of school you have completed or the highest degree you have received?	Multiple choice
Household Employment	Was anyone in the household employed at least 11 out of the past 12 months?	Multiple choice

Table 1 *Cont.*

Household Income	What is your annual household income including all contributing members?	Multiple choice Programming showed 4 answer choices based on total household size. Answer choices were ranges of income that correlated with the following 2015 federal poverty levels: • 100% FPL and below • 101% to 138% FPL • 139% to 200% FPL • Above 200% FPL The programming created a variable for each poverty level automatically which took into account household size and income range.
English as Primary Language	Is English the primary language spoken in your home?	Multiple choice Children whose primary language spoken at home was English are referred to as EPL children (English Primary Language) and Children whose primary language spoken at home was not English are referred to as NEPL (Non English Primary Language) throughout this study (Yu & Singh, 2009).
Household Size	How many children under age 18 are living in your home?	Both questions were open-ended responses.
	How many adults (ages 19 and over) live in your household? Please make sure to include yourself.	The two variables of children in the household and adults in the household were combined into a single variable to calculate total household size.
Parent Relationship Status	Which of the following best describes your current relationship status?	Multiple choice

The covariates included in this study were modeled after Guendelman and Pearl (2004) and Guendelman et al. (2006) with a few exceptions. First, this study excluded parent immigration status due to the sensitive nature of this information and child disability status due to the complexity of defining the term "disability" in a brief web-based survey. Furthermore, this study addressed a limitation of the studies by Guendelman and Pearl and Guendelman et al. by including additional covariates of interest. Geographic region was analyzed for significance independently with each outcome variable of interest to determine if it should be added as a covariate in this study. Four regions were established utilizing zip code data including Western, South Central, North Central, and Eastern. For a list of counties included in each region, see Appendix B. Household employment was added as a covariate because it was included in other studies (Davidoff et al., 2003; DeVoe, Krois, et al., 2008a, 2008b; DeVoe et al., 2009; Dubay and Kenney, 2003; Goedken et al., 2014). This study also included parent usual source of medical care as a covariate in the adjusted model assessing the impact of parents having health insurance on child usual source of medical care because previous research has documented a relationship between parent and child health care access (DeVoe et al., 2011; Hanson, 1998; Minkovitz et al., 2002).

Previous studies were inconsistent in the measurement of covariates. In studies that included the same covariates, the response scales varied. For example, some studies examined child age in groups of age ranges and other studies treated age as a continuous variable. In order to address the variability in the measurement of variables in previous research, items on the survey instrument captured maximized response scales. This allowed the researcher to obtain the most detailed information from the participants. It also reduced the potential for response bias, resulting from a limited scale, and provided the researcher the flexibility to collapse categories

post hoc to match prior designs.

Analysis Design

Utilizing a frequency analysis, data was cleaned for missing data, data errors, and measurement errors. Changes were made to less than 2% of the cases with the final sample totaling 1,179 households. Most participant demographics matched to Kentucky census data were within 5% with the exception of White children and English as the primary language spoken at home as shown in Table 1 in Appendix C.

Children ages 0 to 17 included in the sample had an average age of 8.52 years, were almost equally split between male and female (49.8% and 50.2%, respectively), and 86.5% were White as shown in Table 2. The majority of parents in the sample were married (60.8%) and 60.1% had less than a college degree. More than 99% of households spoke English as the primary language in the home (EPL). Nearly half (49.4%) of households lived in the North Central region and about one-fourth (25.9%) of households had incomes below 100% FPL.

Table 2

Sample Demographics

Child Gender	
Female	50.2%
Male	49.8%
Child Race	
Black or African American	8.1%
American Indian or Alaskan Native	0.3%
Asian	0.9%
Hispanic or Latino	3.2%
Native Hawaiian or other Pacific Islander	0.2%
Multiple races	0.3%
Other	0.4%
White	86.5%
Child Age (average)	8.52
Parent Gender	
Mother	79.9%
Father	20.1%
Parent Relationship Status	

Table 2 *Cont.*

In a domestic partnership or civil union	10.0%
Married	60.8%
Widowed	0.6%
Divorced	10.5%
Separated	4.1%
Single, never married	14.0%
Household Employment	
No one employed last 11 of 12 months	17.6%
At least one person employed last 11 of 12 months	82.4%
Parent Education	
Less than high school degree	4.2%
High school degree or equivalent	24.4%
Some college but no degree	31.5%
Associate's degree	13.4%
Bachelor's degree	18.4%
Master's degree	7.5%
Doctorate degree	0.5%
Language	
NEPL	0.9%
EPL	99.1%
Income	
100% FPL and below	25.9%
101% to 138% FPL	17.3%
139% to 200% FPL	17.9%
Above 200% FPL	38.9%
Geographic Region	
Western	16.2%
South Central	11.6%
North Central	49.4%
Eastern	22.8%
Household Size (mean)	3.94

Note. n = 1,179. NEPL = Non English Primary Language; EPL = English Primary Language.

Binomial logistic regression was the primary statistical method utilized for this study. Logistic regression is similar to the general linear model but rather than utilizing sum of squares as the criterion for determining model fit, maximum likelihood in the form of log(odds) is utilized. Logistic regression is often used in health research due to its ability to predict a group membership (Munro, 2005). The assumptions associated with logistic regression include:

- The outcome variable must be binary.

- There must be no multicollinearity among the predictors.
- There must be a linear relationship between the continuous predictor variables and the log(odds) of the predicted variables.
- There must be independence of observations.

The use of binomial logistic regression was chosen for this study because it was the method of choice in all studies included in the literature review with the exception of Ku and Broaddus (2000). In addition, because the outcome variables are dichotomous, logistic regression is a better choice than ordinary least squares (Tabachnick & Fidell, 2013). Logistic regression models assessed parent health insurance status as a predictor of each outcome variable of interest (child health insurance status and child usual source of medical care).

The impact of parent health insurance status on child health insurance status was first analyzed with an unadjusted logistic regression model which included parent health insurance status as a predictor of child health insurance status. The unadjusted logistic regression equation was $logit(Y) = b_0 + b_1X_1 + e$, where Y was the outcome variable of interest, b_0 was the constant, and b_1 was the coefficient for X_1. In this model, Y was child health insurance status and X_1 was parent health insurance status. The adjusted logistic regression equation analyzing parent health insurance status as a predictor of child health insurance status with the inclusion of covariates was as follows: $logit(Y) = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11} + e,$ where Y was the outcome variable of interest, b_0 was the constant, and b_1 was the coefficient for X_1 (and so forth for subsequent predictor variables). Parent health insurance status was the primary predictor variable with 10 covariates as shown in Table 3.

Table 3

Adjusted Model Variables Predicting Child Health Insurance Status

Sample Attribute	Variable	Variable Type
Y	Child Health Insurance Status	Primary Outcome Variable
X_1	Parent Health Insurance Status	Primary Predictor Variable
X_2	Child Gender	Covariate
X_3	Child Age	Covariate
X_4	Child Race	Covariate
X_5	Child Health Status	Covariate
X_6	Parent Education	Covariate
X_7	Parent Relationship status	Covariate
X_8	Household Employment	Covariate
X_9	Household Income	Covariate
X_{10}	English as Primary Language	Covariate
X_{11}	Household Size	Covariate

The unadjusted logistic regression equation for parent health insurance status as a predictor of child usual source of medical care was $logit(Y) = b_0 + b_1X_1 + e$, where Y was child usual source of medical care and X_1 was parent health insurance status. The adjusted logistic regression equation for the model predicting child usual source of medical care was as follows: $logit(Y) = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11} + b_{12}X_{12} + b_{13}X_{13} + b_{14}X_{14} + e$. Parent health insurance status was the primary predictor variable with 13 covariates as shown in Table 4.

Table 4

Model Variables Predicting Child Usual Source of Medical Care

Sample Attribute	Variable	Variable Type
Y	Child Usual Source of Medical Care	Primary Outcome Variable
X_1	Parent Health Insurance Status	Primary Predictor Variable
X_2	Child Gender	Covariate

Table 4 *Cont.*

X_3	Child Age	Covariate
X_4	Child Race	Covariate
X_5	Child Health Insurance Status	Covariate
X_6	Child Health Status	Covariate
X_7	Parent Usual Source of Medical Care	Covariate
X_8	Parent Education	Covariate
X_9	Parent Relationship Status	Covariate
X_{10}	Household Employment	Covariate
X_{11}	Household Income	Covariate
X_{12}	English as Primary Language	Covariate
X_{13}	Household Size	Covariate
X_{14}	Region	Covariate

Chapter 4: Results

This study examined the impact of parents having health insurance coverage on their children's health care using binomial logistic regression. In this study, two measures of children's health care were analyzed including children having health insurance coverage and children having a usual source of medical care. The study aimed to answer the following research questions:

- What impact does parents' health insurance status have on their children's health insurance status?
- What impact does parents' health insurance status have on their children having a usual source of medical care?

After determining the analysis met the assumptions for logistic regression, unadjusted and adjusted models for each research question were compared. The log(odds), also called the likelihood statistic, was used to assess how well the overall model fit the data. The log likelihood test compared the base (unadjusted) model with the adjusted model. Variance was explained using Nagelkerke R^2 and the *Wald* statistic assessed the significance of each individual variable. Effect size was analyzed using odds ratio (*OR*) and associated confidence intervals (CI).

Parent and Child Health Insurance Patterns

Overall, 97.5% of children and 92.9% of parents were insured. Table 5 shows that children were closely split on private versus public health insurance with 48.1% of children publicly insured and 47.8% of children privately insured. In comparison, 31.4% of parents had public insurance through Medicaid and 52.7% had private insurance.

Table 5

Child and Parent Health Insurance Frequencies

	Child Insurance Status *(f)*	Child Insurance Status (%)	Parent Insurance Status *(f)*	Parent Insurance Status (%)
Private	563	47.8	621	52.7
Public	567	48.1	370	31.4
Insured, type unknown	20	1.7	6	0.5
Uninsured	29	2.5	84	7.1
Medicare[a]	-	-	98	8.3
Total	1,179	100	1,179	100

Note. f = frequencies.
[a]Children are not eligible for Medicare.

Patterns for child health insurance status and type with parent health insurance status and type were compared using a chi-square test of independence. As presented in Table 6, child health insurance status and type were associated with parent health insurance status and type.

Table 6

Comparison of Parent Health Insurance as a Percentage of Child Health Insurance by Type

	Children on Private Insurance	Children on Public Insurance	Uninsured Children
Parent Insurance Status			
Private	92.0_a	16.9_b	20.7_b
Public – Medicaid	2.0_a	62.1_b	6.9_a
Medicare	3.0	13.1	6.9
Insured, type unknown	0.0	0.5	0.0
Uninsured	3.0_a	7.4_b	65.5_c

Note. N = 563 for children on private insurance. *N* = 567 for children on public insurance. *N* = 29 for uninsured children. This table excludes 20 cases where the parent selected "I don't know" to the question regarding child insurance type. Cells that share a common subscript letter in each row are not significantly different from each other at $p < .05$. In rows where letters are missing, there were not enough counts in each cell to compare significant differences.

Ninety-two percent of privately insured children had privately insured parents; 62.1% of publicly insured children had publicly insured parents; and 65.5% of uninsured children had uninsured parents.

Research Question 1: Impact of Parents Having Health Insurance on Child Health Insurance Status

The unadjusted logistic regression model showed that parent health insurance status was a significant predictor of child health insurance status as shown in Table 7. The unadjusted model was statistically significant $\chi 2(1) = 68.53$, $p < .01$ and explained 27.4% of the variance in child health insurance status. Children had 31.71 higher odds of being uninsured if their parents were uninsured, 95% CI, [14.17, 70.98].

Table 7

Parent Health Insurance Status as a Predictor of Child Uninsurance (Unadjusted)

							95% CI	
	B	*SE*	*Wald*	*df*	*p*	*UOR*	*LL*	*UL*
Parent Insurance Status								
Uninsured*	3.46	0.41	70.73	1	< .001	31.71	14.17	70.98
Insured (Reference)								
Constant	-4.69	0.32	217.65	1	< .001	0.01		-4.69

Note. $N = 1{,}179$. *$p < .05$. *UOR* = unadjusted odds ratio; CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

The adjusted model for parent health insurance status as a predictor of child health insurance status with 10 covariates was statistically significant, $\chi 2(12) = 95.03$, $p < .01$. The model explained 37.6% of the variance in child health insurance status. Parent health insurance status, child gender, and being Hispanic or Latino were significant predictors of child health insurance status in the adjusted model as presented in Table 8. Female children had 2.77 higher odds to be uninsured than males, 95% CI, [1.01, 7.60]. Hispanic or Latino children had 5.36 higher odds than White children to be uninsured, 95% CI, [1.17, 24.64]. Parent health insurance

status had the largest effect on child health insurance status in the adjusted model; children with uninsured parents had 31.76 higher odds to be uninsured than children with insured parents, 95% CI, [12.77, 78.99]. Removing parent health insurance status as a predictor in the adjusted model reduced the variance explained from 37.6% to 15.3%

Table 8

Parent Health Insurance Status as a Predictor of Child Uninsurance (Adjusted)

							95% CI	
	B	*SE*	*Wald*	*df*	*p*	*AOR*	*LL*	*UL*
Parent Insurance Status								
Uninsured*	3.46	0.47	55.33	1	< .001	31.76	12.77	78.99
Insured (Reference)								
Child Gender								
Female**	1.02	0.51	3.94	1	.05	2.77	1.01	7.60
Male (Reference)								
Child Age	0.06	0.05	1.51	1	.22	1.06	0.97	1.16
Child Race			6.48	7	.49			
Black or African American	-1.16	1.22	0.91	1	.34	0.31	0.03	3.42
American Indian or Alaskan Native	-16.40	19242.94	0.00	1	1.00	0.00	0.00	.
Asian	-0.47	1.57	0.09	1	.77	0.63	0.03	13.69
Hispanic or Latino*	1.68	0.78	4.65	1	.03	5.36	1.17	24.64
Native Hawaiian or other Pacific Islander	-16.22	28363.79	0.00	1	1.00	0.00	0.00	.
Multiple races	-16.32	19568.39	0.00	1	1.00	0.00	0.00	.
Other	-15.96	17130.52	0.00	1	1.00	0.00	0.00	.
White (Reference)						1.00		
Child Health Status	-0.40	0.33	1.41	1	.23	0.67	0.35	1.29
Parent Relationship Status			2.86	5	.72			
In a domestic partnership or civil union	-0.79	1.03	0.59	1	.44	0.45	0.06	3.42
Married	0.25	0.67	0.13	1	.71	1.28	.35	4.72
Widowed	-19.47	12132.53	0.00	1	1.00	0.00	0.00	.
Divorced	-0.91	0.99	0.84	1	.36	0.40	0.06	2.81
Separated	0.37	0.98	0.15	1	.70	1.45	0.21	9.85
Single (Reference)								
Household Employment								

Table 8 *Cont.*

No one employed last 11 of 12 months	0.79	0.58	1.84	1	.17	2.20	0.70	6.89
At least one person employed last 11 of 12 months (Reference)								
Parent Education	-0.21	0.21	0.99	1	.32	0.81	0.53	1.23
Language								
NEPL	0.89	1.60	0.31	1	.58	2.44	0.11	56.23
EPL (Reference)								
Income	0.14	0.25	0.32	1	.57	1.15	0.71	1.87
Household Size	-0.31	0.22	2.00	1	.16	0.73	0.47	1.13
Constant	-4.10	1.38	8.78	1	< .005	0.02		

Note. n = 1,179. *p < .05. **p < .10. *AOR* = adjusted odds ratio; CI = confidence interval; *LL* = lower limit; *UL* = upper limit. NEPL = Non English Primary Language; EPL = English Primary Language; Child Health Status, Parent Education, and Income treated as continuous variables (Pasta, 2009).

Between the two models, variance explained an increase of 10.2 percentage points, from 27.4% in the unadjusted model to 37.6% in the adjusted model, indicating covariates impacted explained variance. The odds of children being uninsured if they had an uninsured parent increased from the unadjusted model to the adjusted model, 31.71 to 31.76, respectively.

Geographic region was analyzed using a chi-square test of independence to identify the potential impact of region on child health insurance status. The results of the Pearson Chi-Square showed no difference in child health insurance status among the four regions, p = .827. Due to the homogeneity of regions among child health insurance status, region was not added as a covariate in the adjusted model.

Research Question 2: Impact of Parents Having Health Insurance on Child Usual Source of Medical Care

Parent health insurance status was examined as a predictor of child usual source of medical care using unadjusted and adjusted logistic regression models. The unadjusted model

excluded nine cases where the parent selected "I don't know" to the question regarding the type of place they usually take their children to for medical care; therefore, n = 1,170 in the unadjusted model. The model showed that parent health insurance status was a significant predictor of child health insurance status as shown in Table 9. The unadjusted model was statistically significant $\chi 2(1) = 8.10$, $p < .01$ and explained 1.8% of the variance in child usual source of medical care. Children were 2.89 times more likely to lack a usual source of medical care if their parents were uninsured, 95% CI, [1.49, 5.61].

Table 9

Parent Health Insurance Status as a Predictor of Children Lacking a Usual Source of Medical Care (Unadjusted)

							95% CI	
	B	*SE*	*Wald*	*df*	*p*	*UAR*	*LL*	*UL*
Parent Insurance Status								
Uninsured	1.06	0.34	9.77	1	< .005	2.89	1.49	5.61
Insured (Reference)								
Constant	-2.82	0.13	459.04	1	< .001	0.06		

Note. n = 1,170. *$p < .05$. *UOR* = uadjusted odds ratio; CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

Prior to analyzing the adjusted model for parent health insurance status as a predictor of child usual source of medical care, child usual source of medical care was examined by geographic region. The chi-square test of independence revealed significant regional differences, p = 0.26; the significant difference was between the Eastern and South Central regions as displayed in Table 10.

Table 10

Percentages of Children with a Usual Source of Medical Care by Geographic Region

	Western	South Central	North Central	Eastern
Child has usual source of medical care	$91.5_{a, b}$	89.8_{b}	$94.1_{a, b}$	96.6_{a}

Note. n = 1,170. n = 189 for Western region. n = 137 for South Central region. n = 576 for North Central region. n = 268 for Eastern region. Cells that share a common subscript letter in each row are not significantly different from each other at $p < .05$.

Because significant regional differences existed for children having a source of medical care, this variable was included as a covariate in the adjusted model. The adjusted model (n = 1,162) excluded cases where the parent selected "I don't know" on questions pertaining to child or parent usual source of medical care. The adjusted logistic regression model was statistically significant, $\chi 2(14) = 161.58$, $p < .01$ and explained 35.5% of the variance in child usual source of medical care. In the adjusted model, parent health insurance status was not a significant predictor of child usual source of medical care as shown in Table 11. Child age, being Black or African American, parent usual source of medical care, language, and region were significant predictors in the adjusted model.

Table 11

Parent Health Insurance Status as a Predictor of Children Lacking a Usual Source of Medical Care (Adjusted)

							95% CI	
	B	*SE*	*Wald*	*df*	*p*	*AOR*	*Lower*	*Upper*
Parent Insurance Status								
Uninsured	-0.43	0.51	0.69	1	.40	0.65	0.24	1.79
Insured (Reference)								
Child Gender								
Female	-0.17	0.29	0.33	1	.57	0.85	0.48	1.49
Male (Reference)								

Table 11 *Cont.*

Child Age*	0.11	0.03	13.83	1	< .001	1.12	1.05	1.19
Child Race			7.43	7	.39			
Black or African American*	1.06	0.39	7.23	1	.01	2.89	1.33	6.28
American Indian or Alaskan Native	-19.23	18234.86	0.00	1	1.00	0.00	0.00	.
Asian	-18.41	11553.57	0.00	1	1.00	0.00	0.00	.
Hispanic or Latino	0.67	0.84	0.64	1	.42	1.96	0.38	10.13
Native Hawaiian or other Pacific Islander	-18.69	24955.70	0.00	1	1.00	0.00	0.00	.
From multiple races	-16.71	19709.35	0.00	1	1.00	0.00	0.00	.
Other	-18.16	16157.66	0.00	1	1.00	0.00	0.00	.
White (Reference)						1.00		
Child Insurance Status								
Uninsured	0.74	0.70	1.11	1	.29	2.09	0.53	8.23
Insured (Reference)								
Child Health Status	-0.07	0.20	0.14	1	.71	0.93	0.63	1.37
Parent Care Source								
No usual source of care*	2.82	0.32	76.20	1	< .001	16.72	8.88	31.47
Usual source of care (Reference)								
Parent Education	-0.11	0.13	0.69	1	.41	0.90	0.70	1.16
Parent Relationship Status			3.07	5	.69			
In a domestic partnership or civil union	0.38	0.53	0.50	1	.48	1.46	0.51	4.13
Married	-0.28	0.43	0.42	1	.51	0.75	0.32	1.76
Widowed	-17.96	14392.13	0.00	1	1.00	0.00	0.00	.
Divorced	0.30	0.55	0.29	1	.59	1.35	0.45	3.99
Separated	0.19	0.73	0.07	1	.79	1.21	0.29	5.08
Single (Reference)						1.00		
Household Employment								

Table 11 *Cont.*

No one employed last 11 of 12 months	-0.16	0.39	0.17	1	.68	0.85	0.39	1.84
At least one person employed last 11 of 12 months (Reference)								
Income	-0.14	0.15	.87	1	.35	0.87	0.65	1.17
Language								
NEPL*	3.48	0.99	12.50	1	< .001	32.56	4.73	224.39
EPL (Reference)								
Household Size	0.01	0.12	0.00	1	.96	1.01	0.80	1.27
Region			12.48	3	.01			
Western	0.90	0.50	3.27	1	.07	2.47	0.93	6.57
South Central*	1.59	0.52	9.47	1	< .005	4.92	1.78	13.57
North Central	0.40	0.46	0.73	1	.39	1.49	0.60	3.68
Eastern (Reference)								
Constant	-3.86	0.91	17.80	1	< .001	.021		

Note. n = 1,162. *p < .05. *AOR* = adjusted odds ratio; CI = confidence interval; *LL* = lower limit; *UL* = upper limit. NEPL = Non English Primary Language; EPL = English Primary Language; Child Health Status, Parent Education, and Income treated as continuous variables (Pasta, 2009).

For each increase in child age, children had 1.12 higher odds of having no usual source of medical care, 95% CI, [1.05, 1.19]. Black or African American children were 2.89 times more likely to lack a usual source of care than White children, 95% CI, [1.33, 6.28]. Children in the South Central region had 4.92 higher odds of having no usual source of medical care than children in the Eastern region, 95% CI, [1.78, 13.57].

The two variables with the largest effect sizes included parent usual source of medical care and English as a primary language. Children with parents who lacked a usual source of medical care were 16.72 times more likely to lack a usual source of medical care than children with parents who had a usual source of medical care, 95% CI, [8.88, 31.47]. Language had the

largest effect size; NEPL children had 32.56 higher odds of having no usual source of care than EPL children, 95% CI, [4.73, 224.39].

Chapter 5: Discussion

Despite gains, children remain uninsured across the United States and many of them have been deemed eligible for public health insurance (Rudowitz et al., 2016). The documented relationship between parent and child health care utilization caused researchers to examine the relationship between parent health insurance status and child health insurance status as a potential explanation of why children eligible for Medicaid or CHIP remained uninsured. The premise was that if states offered more affordable health insurance options to parents, more children would become insured and access needed health care.

This study examined the impact of parents having health insurance on their children's health care and addressed the following research questions:

- What impact does parents' health insurance status have on their children's health insurance status?
- What impact does parents' health insurance status have on their children having a usual source of medical care?

This study adds to the field of research as it examines the relationship between child and parent health care in the state of Kentucky, which expanded coverage options to parents as a result of the ACA. It provides information on a state post-ACA implementation which can help inform policymakers as they discuss potential state and federal health care changes.

The results found that most Kentucky children and parents were insured. Children were more likely to be uninsured if their parents were uninsured, and children were likely to have the same type of health insurance as their parents. Parent health insurance status had the greatest impact on child health insurance status after adjusting for other factors. Children were more likely to lack a usual source of medical care if their parents were uninsured; however, when the

results were adjusted for other predictors, this relationship became non-significant.

Synthesis of Findings

This study revealed high rates of insured children and parents, 97.5% and 92.9%, respectively. Previous studies suggested that if affordable health insurance options were expanded to more parents, such as expanding Medicaid to low-income parents, more children would become insured (Davidoff et al., 2003; Dubay & Kenney, 2003; Ku & Broaddus, 2000; Sommers, 2006), and this study supports that hypothesis. Recent estimates, including the data from this study, indicate children gained health insurance coverage in Kentucky since the state expanded affordable health insurance options for low-income adults, including many parents in 2014. As stated in the literature review, Kentucky's rate of uninsured children was 4.2% in 2015, compared to 6.3% in 2009 according to the U.S. Census Bureau American Community Survey. This study found that 2.5% of Kentucky children were uninsured, which is lower but within the bounds of error for the sample size (95% CI, ±3%) compared to the 2015 U.S. Census Bureau estimate. It is also possible that the rate of uninsured children has decreased since the 2015 census estimates. The decrease in uninsured Kentucky children occurred during a timeframe when eligibility for public health insurance among low-income children, including Medicaid and KCHIP, did not change.

The U.S. Census Bureau estimated that Kentucky's rate of uninsured parents dropped from 18% in 2009 to 7% in 2015. This study found that 7.1% of parents were uninsured, which aligns with the 2015 census data. As stated previously, more affordable health insurance options were offered to low-income and middle-income Kentucky parents beginning in 2014, including expanding Medicaid for adults up to 138% FPL and providing discounts on private health insurance for families with incomes 100% to 400% FPL.

DeVoe et al. (2015) hypothesized that additional children would obtain health insurance after affordable health insurance options were available to more parents, especially those with lower incomes, due to the implementation of the ACA. The authors referred to this occurrence as a "welcome mat" effect, which is the result of parents enrolling their children in public health insurance after finding out that they, as parents, are eligible for public health insurance. Due to the finding of this study that parent health insurance status is the best predictor of child health insurance status, the researcher suggests the increase in rates of insured children in Kentucky since 2009 may be due to more parents gaining health insurance coverage.

Despite progress made in health insurance coverage in Kentucky, children and parents remain uninsured. The 2.5% of uninsured children revealed in this study translates to an estimated 25,000 Kentucky children.[1] Prior studies have documented the importance of health insurance coverage for children. Leininger and Levy (2015) found that continuous health insurance coverage impacted child health outcomes including reduced child mortality rates and increased health status of children. Studies have also found that children who have health insurance are more likely to have a usual source of medical care and receive preventive care and less likely to have unmet health care needs than uninsured children (Cassedy et al., 2008; Cummings et al., 2009). Given the importance of health insurance for children, the findings of this study provide important insights for efforts to cover the remaining uninsured children in Kentucky and across the United States.

Children's health insurance status and type were closely aligned to their parents' health insurance status and type. The patterns between child and parent health insurance status and type align with prior research (Davidoff et al., 2003; Guendelman & Pearl, 2004). This study did not find that children with privately insured parents were more likely to be uninsured than children

with publicly insured parents which differs from the findings of DeVoe, Krois, et al. (2008b). One reason for children and parents having the same type of insurance is likely due to household income and eligibility for public health insurance. Children in Kentucky are eligible for Medicaid or KCHIP up to 200% FPL and parents are eligible for Medicaid up to 138% FPL. This means that in households up to 138% FPL, both the children and parents are eligible for Medicaid. Likewise, parents who have private insurance through their employer may also have the option of enrolling their children in employer health insurance. Therefore, children and parents in these households would have private insurance.

This study found that parent health insurance status is the best predictor of child health insurance status. This finding supports previous studies documenting that when parents have health insurance, their children are more likely to have health insurance (DeVoe, Crawford, et al., 2015; DeVoe, Krois, et al., 2008a, 2008b; Dubay & Kenney, 2003; Guendelman & Pearl, 2004; Guendelman et al., 2006; Ku & Broaddus, 2000; Yamauchi et al., 2013). The finding that parent health insurance status had the greatest impact on child health insurance status taking into account child, parent, and household demographics aligns with that of other authors (DeVoe, Krois, et al., 2008b). Interestingly, socioeconomic status, previously found by researchers to impact child health insurance status, was not a significant predictor of child health insurance status in this study, indicating efforts by state and federal leaders to close the coverage gap for children have been effective.

A usual source of medical care, other than the emergency room or an urgent care clinic, helps children receive needed preventive care and timely sick care, reduces health disparities among vulnerable groups, and improves health outcomes (Bartman et al., 1997; Gadomski et al., 1998; Smith et al., 2005; Starfield & Shi, 2004). This study found that when adjusted for

covariates, parent health insurance status was not a significant predictor. The finding aligns with the earliest of the four studies analyzing the impact of parent health insurance status on child usual source of medical care after adjusting for covariates (Davidoff et al., 2003) but deviates from findings of later studies on this topic (Guendelman & Pearl, 2004; Guendelman et al., 2006; DeVoe, et al., 2009).

Implications for Theoretical Framework

This study has implications for the behavioral health services use model proposed by Anderson (1968). Anderson outlined that predisposing factors such as demographics, enabling factors such as health insurance, and need factors such as illness lead to health care use. Parent health insurance status is identified as the most important enabling factor of children having health insurance in a state that expanded coverage options as a result of the ACA. However, parents having health insurance does not extend as an important enabling factor of children having access to health care, given other factors. Based on the findings of this study, other predisposing and enabling factors are more important to ensure children have a usual source of medical care.

As previously noted, Aday and Anderson (1974) indicated that health policy often focuses on enabling factors such as health insurance that can be more easily manipulated through policy change. This holds true in this study as the potential enabling factor of parents having health insurance has been impacted by health policy changes in Kentucky, resulting from implementation of the ACA. If parent health insurance options are reduced in the coming months or years, children will likely be impacted.

Implications for Child Health Insurance

An important implication of this study is that policies that expand affordable health insurance options to more parents and children result in most obtaining health insurance coverage. This is evident by the high rates of insured children and parents and the upward trend in health insurance coverage rates after expansion of health insurance coverage in Kentucky. Policymakers should recognize that changes which reduce or limit health insurance options in a state like Kentucky where most people are insured, will likely reverse the progress made in insuring more individuals.

This study suggests that expanding affordable health insurance options for low-income parents results in more children obtaining health insurance coverage. As changes to the health care system both in Kentucky and at the federal level are discussed, policymakers need to analyze how potential changes would directly and indirectly impact children. Recent estimates, including those in this study, suggest that children have benefited from more parents obtaining health insurance in Kentucky during a time when children's eligibility for public health insurance did not change. Efforts should be to ensure long-term affordable health insurance options for families as a unit, including children and their parents.

The findings of this study imply that changes to the health care system that reduce affordable health insurance options for parents will cause children to become uninsured even if health insurance options, such as Medicaid and CHIP eligibility, do not change for children. For example, Kentucky began to seek permission from the federal government to change its Medicaid program in 2016 with implementation to begin in 2017. The approval of the changes is still pending at the time of this study (Artiga, Tolbert, & Rudowitz, 2016). Most of the proposed changes to Medicaid would impact low-income adults, including many parents, who

gained health insurance through Medicaid expansion implemented in 2014. The new Medicaid program would require some adults to pay increasing monthly premiums and participate in a specified number of monthly volunteer or work hours to maintain Medicaid coverage. If Kentucky implements these changes, some parents will likely not be able to fulfill the requirements and as a result, lose Medicaid coverage and become uninsured. If this happens, the rate of uninsured children will likely increase even if the changes do not directly impact children. A comparable scenario occurred in Oregon in the early 2000s when the state implemented similar cost-sharing mechanisms for certain adults on Medicaid. Many parents lost health insurance coverage, and research documented that a significant portion of children with parents who lost health insurance coverage became uninsured (DeVoe, Lisa Krois, et al., 2008a).

Finally, despite state and federal policy changes that have expanded health insurance options, some children and parents remain uninsured. Interestingly, the most often reported reason by parents for having an uninsured child in this study was "Health insurance is too expensive," yet three-fourths (75.9%) of uninsured children had family incomes at or below 200% FPL. Given their household income levels, these children should have been eligible for public health insurance through Medicaid or KCHIP based on Kentucky's eligibility thresholds for the programs in 2016. Similarly, the top self-reported reason among parents for being uninsured was "Health insurance is too expensive." More than half (56.0%) of uninsured parents had family incomes at or below 138% FPL, meaning they should have been eligible for Medicaid based on Kentucky's Medicaid eligibility levels for low-income adults.

Uninsurance among children and parents in Kentucky needs further study. Efforts to understand remaining barriers to obtaining health insurance can help Kentucky and other states implement efforts to cover the remaining uninsured population. The lack of knowledge about

eligibility for public health insurance may be one reason for uninsurance in Kentucky. Increased outreach and education efforts might help more children and parents enroll in health insurance. Kentucky implemented a multifaceted, large-scale outreach and education campaign to promote enrolling in health insurance from 2013 to 2015, yet those efforts were scaled back after the new Governor took office in late 2015 (Artiga et al., 2016). Another potential reason for uninsurance could be related to differences in the value placed on health insurance and cultural influences. Further research, and specifically qualitative research, could explore these unanswered questions.

Implications for Child Usual Source of Medical Care

This study offers new insight into factors that influence a child having a regular place they go to for health care services, termed a usual source of medical care, in a state that expanded coverage options as a result of the ACA. As noted earlier, a usual source of medical care helps ensure children receive preventive health care services to avoid health problems and timely health care treatment when health problems arise. This study finds that children are no more likely to have a usual source of care if their parents are insured than if their parents are uninsured, when considering other predictors.

One potential reason for this finding could be that when coverage options are expanded, more people become insured but they face barriers to accessing health care. Parents might not have the knowledge or health literacy to utilize the health care system to promote positive health of their children like establishing a usual source of medical care. It may be especially difficult for parents with children on Medicaid to find providers who accept Medicaid located close to where they live. DeVoe, Graham, Angier, Baez, and Krois (2008) found that parents with Medicaid-eligible children viewed health insurance coverage and accessing health care as separate issues. In addition, they found parents with children on Medicaid reported barriers in

accessing health care not encountered by those with uninsured children, such as identifying a provider who would take Medicaid. Further research could explore why children lack a usual source of medical care and how to promote a usual source of medical care among children. Finally, this study offers further support of the relationship between child and parent health care access, analyzed as parent and child usual source of care in this study.

Limitations

One limitation of this study is that health insurance status was measured at a single point in time. This means that a child might have been uninsured in the month or day prior to the survey but was insured when the parent took the survey. Although studies have supported the importance of continuous health insurance for children as noted by Cummings et al. (2009), this study specifically focused on health insurance status, not long-term health insurance coverage. Further research could analyze the predictors of continuous health insurance coverage for children in Kentucky.

Another limitation of this study was that it was only administered in English and via the internet. Households where English was not the primary language spoken in the home are under-represented in the study as the U.S. Census Bureau data shows in Table 1 of Appendix C. In addition, households with limited access to the internet were likely underrepresented in this study. It proves difficult to estimate internet access and use. In 2013, about three-fourths (74.8%) of Kentuckians lived in a household with high-speed internet use according to the U.S. Census Bureau American Community Survey (File & Ryan, 2014); however, this statistic does not include individuals who access the internet via cell phones, at a place of employment or at a public place such as the library. In addition, some households may have internet with slower

speeds. Given that most sample demographics were within 5% of Kentucky Census data from 2015, the researcher considered the sample representative of the population of interest.

This study excluded children in the foster care system and those being raised by relatives if the caregiver was not the biological or adopted parent. The exclusion of this population in the study should be noted, yet it allowed for a streamlined analysis of the impact of parents' having health insurance on their children's health care. Children in the foster care system are eligible for Medicaid and supposed to be enrolled in Medicaid by their caseworker, so they were not the target population for this study.

Finally, this study was conducted over a time period when Kentucky implemented changes to its health insurance exchange and proposed changes to its Medicaid program. Kentucky went from operating a state-based health insurance exchange to utilizing the federal health insurance exchange in November 2016. This means those enrolling in or renewing their health insurance not through an employer had to utilize a different online system than the two years prior. This could have caused confusion about how to enroll or renew health insurance coverage. It is not believed this impacted the results; however, it was a major change that should be considered.

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Footnote

[1] Kentucky's child population was estimated to be 1,011,667 in 2015 by the United States Census Bureau, National Center for Health Statistics, processed by Kentucky Population Research at the University of Louisville Urban Studies Institute.

Appendix A: Research Instrument

INITIAL SCREENING

1. What is your gender?
   - Male
   - Female

2. How many children under age 18 are living in your home?
   - If none, disqualify.
   - If one or more, move to Q3

3. Of those children, how many are you the biological or adoptive parent?
   - If none, disqualify.
   - If one or more, programming selected one child [QNAME] to be the focus of the survey.

CHILD QUESTIONS

4. What is the age of [QNAME]? _____

5. What is the gender of [QNAME]?
   - Male
   - Female
   - Other (please describe)

6. How do you define the race of [QNAME]?
   - White
   - Black or African American
   - American Indian or Alaskan Native
   - Asian
   - Hispanic or Latino
   - Native Hawaiian or other Pacific Islander
   - From multiple races
   - Other (please describe)

7. Does [QNAME] have health insurance? This includes health insurance offered from your employer or purchased through kynect or healthcare.gov, prepaid plans such as HMOs, or government plans such as Medicaid?
   - Yes
   - No (If no, skip to Q10)

8. What type of health insurance does [QNAME] have?
   - Private plan (purchased through an employer or on your own)
   - Medicaid or KCHIP

- I don't know

9. During the past 12 months, was there any time when [QNAME] did not have health insurance? (After this question, skip to Q12)
   - Yes
   - No
   - I don’t know

10. What is the main reason [QNAME] does not have health insurance?
    - My child does not need health insurance
    - My child is rarely sick
    - The paperwork/process to enroll is too difficult
    - Health insurance is too expensive
    - I do not know how to find information on available health insurance options
    - I plan to to enroll my child in health insurance soon
    - I am in the process of enrolling my child in health insurance
    - Other (please describe)

11. During the past 12 months, was there any time when [QNAME] had health insurance?
    - Yes
    - No
    - I don’t know

12. Is there a place that you usually take [QNAME] for preventive care such as well-child exams or sick care such as treating a cold or the flu?
    - Yes (go to question 13)
    - No (skip to question 14)
    - I don’t know (skip to question 14)

13. What type of place do you usually take [QNAME] to?

    - Doctor’s office, health clinic, health center or health department
    - Hospital emergency room or urgent care center
    - I don’t know
    - Other (please describe)

14. A personal doctor or nurse is a medical professional who knows [QNAME] well and is familiar with [QNAME]'s health history. This might be a general doctor, pediatrician, specialist doctor, nurse practitioner, or physician's assistant. Do you have one or more persons you think of as [QNAME]’s personal doctor or nurse?

    - Yes
    - No

- I don’t know

15. During the past 12 months, did [QNAME] see a doctor, nurse, or other health care professional for any kind of medical care including treating sickness, well-child checkups, immunizations, physical exams, and hospitalizations?

    - Yes
    - No
    - I don’t know

16. Sometimes people have difficulty getting medical care when they need. During the past 12 months, was there any time when [QNAME] needed medical care but it was delayed or not received?

    - Yes
    - No
    - I don’t know

17. In general, how would you describe [QNAME]’s health?
    - Excellent
    - Very good
    - Good
    - Fair
    - Poor

PARENT QUESTIONS

Now, please answer the following questions about yourself.

18. Do you have health insurance? This includes health insurance offered from your employer or purchased through kynect or healthcare.gov, prepaid plans such as HMOs, or government plans such as Medicaid or Medicare?
    - Yes (move to Q19)
    - No (move to Q21)

19. What type of health insurance do you have?
    - Private plan (purchased through an employer or on your own)
    - Medicaid
    - Medicare
    - I don't know

20. During the past 12 months, was there any time when you did not have health insurance?
    - Yes

- No
- I don’t know

21. What is the main reason you do not have health insurance?
    - I do not need health insurance
    - I am rarely sick
    - The paperwork/process to enroll is too difficult
    - Health insurance is too expensive
    - I do not know how to find information on available health insurance options
    - I plan to to enroll in health insurance soon
    - I am in the process of enrolling in health insurance
    - Other (Please describe)

22. During the past 12 months, was there any time when you had health insurance?
    - Yes
    - No
    - I don’t know

23. Is there a place that you usually go for preventive care or when you are sick?
    - Yes (go to question 24)
    - No (skip to question 25)
    - I don’t know (skip to question 25)

24. What type of place do you usually go to?

    - Doctor’s office, health clinic, health center or health department
    - Hospital emergency room or urgent care center
    - I don’t know
    - Other (Please describe)

25. A personal doctor or nurse is a medical professional who knows you well and is familiar with your health history. This might be a general doctor, specialist doctor, nurse practitioner, or physician's assistant. Do you have one or more persons you think of as your personal doctor or nurse?

    - Yes
    - No
    - I don’t know

26. During the past 12 months, did you see a doctor, nurse, or other health care professional for any kind of medical care including sick care, preventive care, physical exams, and hospitalizations?

    - Yes
    - No

- I don't know

27. Sometimes people have difficulty getting medical care when they need it. During the past 12 months, was there any time when you needed medical care but it was delayed or not received?

    - Yes
    - No
    - I don't know

28. In general, how would you describe your health?
    - Excellent
    - Very good
    - Good
    - Fair
    - Poor

DEMOGRAPHICS

29. How many adults (ages 19 and over) live in your household? Please make sure to include yourself. _____

30. Was anyone in the household employed at least 11 out of the past 12 months?
    - Yes
    - No

31. During the last 12 months, did anyone in your household receive cash assistance like TANF, free or reduced priced meals, food stamps, or WIC?
    - Yes
    - No
    - I don't know

32. Which of the following best describes your employment status?
    - Employed, working full-time
    - Employed, working part-time
    - Not employed, looking for work
    - Not employed, NOT looking for work
    - Retired
    - Disabled, not able to work

33. Which of the following best describes your current relationship status?
    - Single
    - In a domestic partnership or civil union Married
    - Widowed
    - Divorced

- Separated

34. What is the highest level of school you have completed or the highest degree you have received?
    - Less than high school degree
    - High school degree or equivalent (e.g., GED)
    - Some college but no degree
    - Associate degree
    - Bachelor degree
    - Graduate degree
    - Doctorate degree

35. How do you define your race?
    - White
    - Black or African American
    - American Indian or Alaskan Native
    - Asian
    - Hispanic or Latino
    - Native Hawaiian or other Pacific Islander
    - From multiple races
    - Other (please describe)

36. Is English the primary language spoken in your home?
    - Yes
    - No

37. Please provide your 5-digit zip code. _____

38. What is your annual household income including all contributing members?

Appendix B: Geographic Regions from the Kentucky Department of Tourism (2017)

Western Region

1. Ballard
2. Caldwell
3. Calloway
4. Carlisle
5. Christian
6. Crittenden
7. Daviess
8. Fulton
9. Graves
10. Henderson
11. Hickman
12. Hopkins
13. Livingston
14. Lyon
15. Marshall
16. McCracken
17. Mclean
18. Muhlenberg
19. Ohio
20. Todd
21. Trigg
22. Union
23. Webster

South Central Region

1. Adair
2. Allen
3. Barren
4. Butler
5. Casey
6. Clinton
7. Cumberland
8. Edmonson
9. Green
10. Hart
11. Logan
12. McCreary
13. Metcalfe
14. Monroe
15. Pulaski
16. Russell
17. Simpson
18. Taylor
19. Warren
20. Wayne

Eastern Region

1. Bath
2. Bell
3. Boyd
4. Breathitt
5. Carter
6. Clay
7. Elliot
8. Estill
9. Floyd
10. Greenup
11. Harlan
12. Jackson
13. Johnson
14. Knott
15. Knox
16. Laurel
17. Lawrence
18. Lee
19. Leslie
20. Letcher
21. Magoffin
22. Martin
23. Menifee
24. Montgomery
25. Morgan
26. Owsley
27. Perry
28. Pike
29. Powell
30. Rockcastle
31. Rowan
32. Whitley
33. Wolfe

North Central Region

1. Anderson
2. Boone
3. Bourbon
4. Boyle
5. Bracken
6. Breckinridge
7. Bullitt
8. Campbell
9. Carroll
10. Clark
11. Fayette
12. Fleming
13. Franklin
14. Gallatin
15. Garrard
16. Grant
17. Grayson
18. Hardin
19. Harrison
20. Henry
21. Jefferson
22. Jessamine
23. Kenton
24. Larue
25. Lewis
26. Lincoln
27. Madison
28. Madison
29. Marion
30. Mason
31. Meade
32. Mercer
33. Nelson
34. Nicholas
35. Oldham
36. Owen
37. Pendleton
38. Robertson
39. Scott
40. Shelby
41. Spencer
42. Trimble
43. Washington
44. Woodford

Appendix C: Matched Sample and Kentucky Census Data

Table 1

Comparison of Sample to Kentucky Census Data by Percentages

	Sample	Kentucky	% Difference of Sample from Kentucky Census Data
Child Gender			
Female	50	51	-1
Male	50	49	+1
Child Age			
0-4	29	27	+2
5-11	38	39	+1
12-17	33	34	+1
Child Race			
Black or African American	8	9	-1
American Indian or Alaskan Native	<.5	<.5	0
Asian	1	2	-1
Hispanic or Latino	3	6	-3
Native Hawaiian or other Pacific Islander	<.5	<.5	0
From multiple races	<.5	-	
Other	<.5	-	
White	87	79	+8
Parent Education			
High school degree	56	52	+4
Associate degree	13	10	+3
Bachelor degree	18	16	+2
Graduate degree	8	11	-3
Parent Relationship Status			
In a domestic partnership or civil union	10	8	+2
Married	61	65	-4
Children in Poverty (100% FPL)	26	26	0
NEPL	1	7	-6

Note. NEPL = English is not the primary language spoken at home. Some variable categories were condensed in order to have comparison groups with Kentucky census data. Variables without an adequate Kentucky comparison are excluded. Kentucky estimates were from the U.S. Census Bureau, 2015.