

**PREDICTORS OF HEALTH CARE ACCESS AMONG
FOREIGN-BORN ADULTS IN THE U.S.:
IMPLICATIONS FOR HEALTH EQUITY AND SOCIAL JUSTICE**

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DEDICATION

I dedicate this dissertation to my family who stood by me with unwavering emotional and physical support throughout my academic journey. To my husband, Dr. Jeremiah Adigun, who has loved, cajoled, encouraged, and pushed me to finish this journey strong. To my oldest son Jeremiah, who has supported me throughout my time in the doctoral program “so mommy can be finally done with school.” To my youngest son Jacob, for helping to keep me in line on those days that mom wants to take a break. I am grateful to God for such brave and intelligent young men you are becoming. To my precious little girl, Sarah, who always wants to know my schedule so as not to “bother mommy when she is studying.” Thank you all for encouraging me to keep going when I felt like giving up. Without my family, I would not have been able to finish this program. I love you all!

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ABSTRACT

Findings from prior studies revealed that foreign-born persons remain a fast-growing segment of the U.S. population. However, little is known about differences in health care access among this population relative to the Affordable Care Act (ACA). Guided by Andersen's model, comparisons regarding access to healthcare by birth origin were assessed before, during, and after implementation of the ACA. Data for this non-experimental correlational study were obtained from three years of the National Health Interview Survey. Chi-square tests and logistic regression models were used to assess differences in access indicators and the influence of various independent and covariate variables of interest, accounting for needs and insurance coverage. Findings from this study revealed citizens, women, married/partnered, older adults, and respondents with chronic illness and in poor health status more frequently reported emergency room (ER) visits, regardless of nativity. Among foreign-born adults, males, those who were married/partnered, and the uninsured were less likely to report ER visits, while uninsured non-white foreign-born adults (FBAs) post-ACA had a four-fold increased likelihood of visiting the ER. Middle-aged, uninsured, low-income, newly arrived, and noncitizens were less likely to visit a physician or have a usual source of care. Uninsured married/partnered FBAs were less likely to report unmet needs and delayed care. The odds of having unmet needs were four-fold higher among the uninsured and two-fold higher among low-income FBAs. Compared with uninsured from the Americas, uninsured FBAs from Asia, Africa, and Europe were three times as likely to report unmet needs and delayed care. Although commonalities in health care access factors were found in both native-born and FBAs; this study's findings suggest even after controlling for confounding factors, health care access and utilization among FBAs continues to be driven by enabling resources. These findings confirm that the use of health care services by FBAs is unequal and lays the groundwork for the evolution of monitoring systems and frameworks for stakeholders interested in reducing health disparities further. Future studies should examine how the factors identified in this analysis differ years after implementation of the ACA and how these influence overall health care outcomes for this underserved population.

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LIST OF ABBREVIATIONS

ACA: Patient Protection and Affordable Care Act

ER: Emergency room

FB: Foreign-born

FBA: Foreign-born adult

FPL: Federal Poverty Line

MD: Doctor

NB: Native-born

NHIS: National Health Interview Survey

U.S.: United States

USOC: Usual source of sick care

CHAPTER 1

INTRODUCTION

Background of the Study

Foreign-born persons remain a fast-growing segment of the population of the United States (U.S.). One-fifth of the world's migrants resided in the U.S. in 2017 (Zong, Batalova, & Hallock, 2018), and foreign-born population accounted for 13.5% or about 43.7 million of the total U.S. population in 2016 (Artiga, Ubri, & Foutz, 2017). According to the Pew Research Center, this number is expected to grow to 18% or 78 million by 2065 (Gustavo, Bialik, & Radford, 2018). A myriad of studies has examined health care disparities in the U.S. over the last four decades, but few have directly examined health care access and utilization by foreign-born persons. Of these studies, evidence suggests that foreign-born adults (FBAs) face significantly disproportionate barriers in accessing health care compared with native-born adults (Capps, McCabe, & Fix, 2011; Chi & Handcock, 2014; Derose, Escarce, & Lurie, 2007; Lee et al., 2016; Tarraf, Vega & González, 2014).

Uninsured individuals between the ages of 35 and 64 are more likely to have increased health needs; however, they may forgo health care and lack a usual source of preventative care (Garfield, Damico, & Orgera, 2018; Wilper et al., 2009). Lack of a usual source of health care has been associated with higher morbidity and mortality rates (Garfield et al., 2018). The Patient Protection and Affordable Care Act (or ACA) was arguably one of the most ambitious programs by the U.S. federal government to address structural problems related to health inequity and health care disparities, including for FBAs. The main provisions of the ACA were implemented in 2014. However, findings from multiple studies showed persistent deficiencies in health care access, quality, and outcomes among FBAs (Artiga, 2017; Chi & Handcock., 2014; Garfield et

al., 2018; Khuu et al., 2017). Therefore, further scholarly attention is needed to examining predictors of access to health care before, during, and after implementation of the major provisions of the ACA.

Statement of the Problem

Health care access for FBAs in the U.S. is complicated, partly because of the heterogeneity of foreign-born population in terms of socioeconomic status, varying levels of health, and patterns of immigration (Derose et al., 2009; Chi & Handcock, 2014; LaVeist, Gaskin, & Richard, 2009; Wallace, 2008). Theoretical and empirical studies over the past decade suggest that FBAs continue to experience significant and disproportionate barriers to health care access, including social marginalization, stigmatization, low socioeconomic status, limited access to societal resources, the stress of the immigration process, and poor access to health care services (Derose et al., 2009).

The focus of this study was to examine health care access among FBAs within the U.S. by drawing a comparison between various characteristics related to access to health care among foreign-born and native-born adults before and after implementation of major provisions of the ACA. The study was guided by Andersen's behavioral model of health services utilization, which includes predisposing, enabling, and need factors.

Purpose of the Study

The overarching goal of this study was to examine factors that predict health care access among FBAs within the U.S. The study used data from the National Health Interview Survey (NHIS) from 2013 to 2015 to describe differences in and factors driving health care access for FBAs during the periods pre-ACA (2013 and 2014) and post-ACA (2015). Four aims, including three specific aims and one exploratory aim were developed for the current project:

Aim 1: To determine characteristics of FBAs and native-born adults in the U.S. related to health care access, based on Andersen's model, before and after implementation of major provisions of the ACA using data from the NHIS (2013–2015).

An **Exploratory Aim** was generated from Aim 1 to determine characteristics of FBAs in the U.S. related to health care access during 2014, with the primary focus of assessing potential variations in health care access based on interview timing. Focusing on 2014 allowed for an examination of changes within the year of implementation of major provisions of the ACA.

Aim 2: To examine predictors of health care access, based on Andersen's model (predisposing, enabling, and need factors), among FBAs in the U.S. before and after implementation of major provisions of the ACA.

Aim 3: To determine predictors of health care access among uninsured FBAs in the U.S., based on Andersen's model (predisposing, enabling, and need factors) before and after implementation of major provisions of the ACA.

By examining factors predicting health care access among foreign-born population, findings from this study could shift the focus of research to the development of programs that can potentially lead to more efficacious, cost-effective, and affordable care for vulnerable populations. Additionally, these findings can potentially set the stage for the development of practice models for examining access to health care among health systems.

Philosophical Perspectives: Health Equity and Social Justice

This study was informed by the core assumptions and ethical aspects of health equity and social justice. Benjamin (2015) defined health equity as a component of social justice, which encompassed a state in which everyone has an equal opportunity to be healthy. Social justice, on the other hand, emphasizes the distribution of wealth and opportunities within and across

societies (Wallace, 2008). Measures of health disparities are used to assess variations in health and health care as health systems strive to achieve health equity (Benjamin, 2015). As previously identified by Aday and Andersen (1981), the assumptions of health equity include the following: (a) health care as a right for all, (b) the resources for allocating health care are limited, and (c) health policy is concerned with the development and design of mechanisms for allocating scarce health care resources in a manner that is ‘just and fair.’

Andersen (1995) argued that access to health care is said to be equitable when health services are distributed based on people's needs and demography or predisposing factors, while inequitable access to health care services occurs when enabling resources, such as income, determine who gets medical care. Social justice, on the other hand, is based upon the allocation of resources to individuals in a society who have the most significant needs (Blumstein & Zubkoff, 1979). If the right to health care is an essential goal of health care systems (Aday & Andersen, 1981) and health equity is viewed as social justice in health (Braveman, 2014), then one can argue that health care disparities are a critical issue in public and population health. Examining forces that influence access to health care among various populations, such as FBAs, could further inform health care delivery and financing by bringing to light forces that create an imbalance in the timeliness, affordability, and quality of care.

Theoretical Framework

Andersen's behavioral model of health services utilization offers a multi-level approach that incorporates individual determinants of health services use (original version is shown in Figure A-4 in the Appendix section). A primary assumption of Andersen's model is that an individual's inclination to use health services is a function of three dynamics: predisposing characteristics, enabling resources, and need factors. Predisposing factors are individual-specific

characteristics and socio-cultural factors that exist before health services use. Enabling factors are defined as structural, logistical aspects or resources that aid health services use, while need factors are described in the literature as perceived and evaluated factors that influence health care services use (Aday & Andersen, 1974; Andersen, 1995; Chi & Handcock, 2014). Andersen (1995) posited that the classification of these three predictors provides a means of evaluating healthcare access and health equity. In current study, groups of variables related to health care access and health equity were selected based on Andersen's model.

As shown in Figure 1, for the predisposing factors, age, gender, marital status, and region of origin were examined; while need factors included health perception, functional limitation, and chronic illnesses. Enabling resources included duration of U.S. residency, citizenship status, insurance coverage, English language proficiency, U.S. region of residence, education level, employment status, and income levels. Focusing on eliminating inequitable access to health care is in line with mandates and recommendations from the National Academy of Medicine, formerly the Institute of Medicine (IOM), which emphasized race and ethnicity as significant predictors of the quality of health care received (IOM, 2002). Need factors were previously described by Babitsch, Gohl, & von Lengerke (2012) as the strongest predictors of health care seeking behavior.

The constructs of Andersen's model are testable and have been applied in different settings in prior studies investigating the use of health services and health systems across a variety of health conditions (Babitsch et al., 2012). In a study by Diehr and Evashwick (1984), Andersen's model was used to examine health care utilization among older adults. Findings from that study revealed that predisposing factors were better predictors of the use of dental services while need factors were better predictors of the use of physician services, hospitalizations,

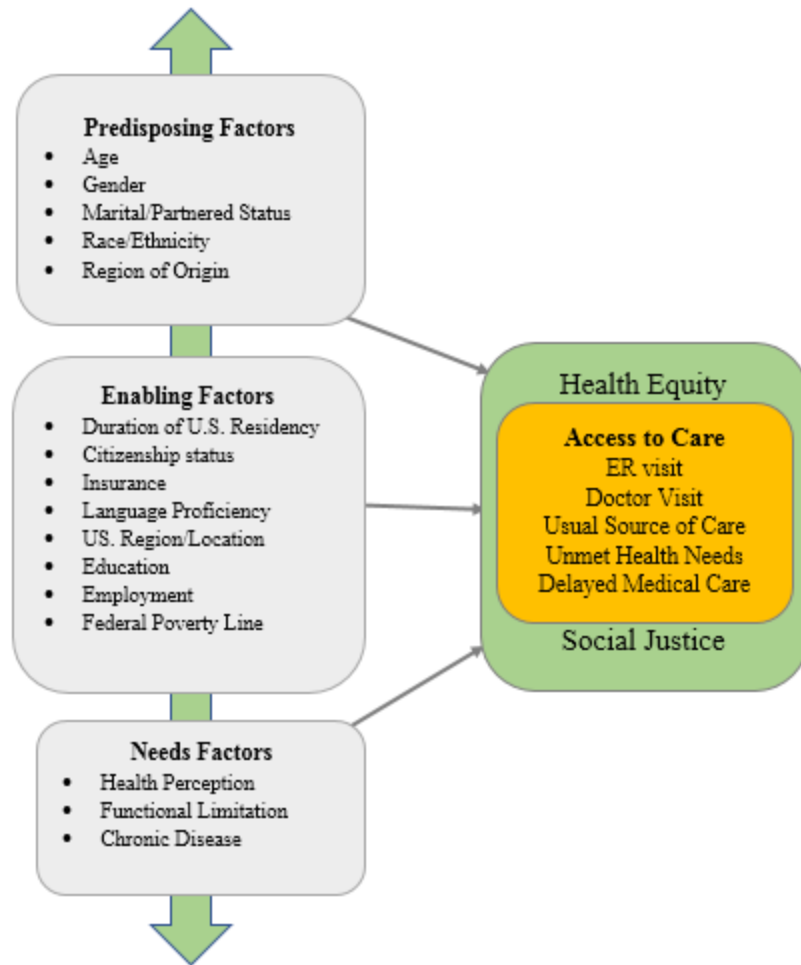


Figure 1: Adapted Andersen's Model of Health Care Utilization

ambulatory care, and home care services. In another study by Weller, Minkovitz, and Anderson (2003), enabling resources were found to have a significant influence on the use of health care services among those who possessed public insurance.

Andersen's model also has been used by various researchers in the nursing and health care fields to evaluate multiple dimensions of access and utilization of health care services. In a study by Buhse, Banker, & Clement (2014), Andersen's model was used to determine which clinical and demographic factors were associated with mental and physical health-related quality of life among older adult populations with multiple sclerosis. In another study by Chatterjee, Mehta, Sherer, and Aparasu (2010), Andersen's model was used to examine factors associated with the use of anticholinergic medication among nursing home residents with dementia. Likewise, Lindley (2015) applied the constructs of Andersen's model to describe the determinants of hospice access. Moreover, using Andersen's model, Lindley, Mixer, and Mack (2016) determined the predictors of access to hospice and home health care.

Applying basic tenets of Andersen's model to the current study allowed for conceptualization of health care access as the dynamic interplay of predisposing characteristics, enabling resources, and need factors while controlling for selected confounders in the study. Moreover, this study drew on Andersen's model through the lens of health equity and social justice as it relates to FBAs (Figure 1). Use of Andersen's model in the current study provided a critical pathway linking access and utilization to health outcomes among this population. The findings from this analysis further add to the existing body of evidence regarding how factors related to FBAs influence health status and lay the groundwork for potential intervention studies to address health disparities within this population. Likewise, findings from this study could inform stakeholders, including policymakers, health care providers, lawmakers, social workers,

nursing educators, social activists, and community leaders seeking to develop programs to reduce health disparities among FBAs, for example via community-based participatory research.

Justification for Selecting Andersen's Model

Andersen's model was chosen for the current study for various reasons. Ontologically, the model incorporates many of the influences on health care status and utilization assessments, including predisposing characteristics, enabling resources, and need factors on potential outcomes of health care access and utilization (Andersen, 1995; Buhse et al., 2014). Application of Andersen's model in the current study provided comprehensive and direct, rather than implied, assessments of health care access among foreign-born population examined. As conceptualized in Figure 1, access to health care for FBAs is embedded within social justice and health equity, which were a missing piece in Andersen's original model. Thus, the model was adapted for the current study to accommodate these two critical elements in health care access and utilization.

Theoretical and Standardized Definitions

For purposes of this study, specific critical theoretical concepts and terms must be defined. *Access to health care* is defined as the appropriate use of personal health services to achieve the best possible outcomes and as a prerequisite to obtaining quality care (IOM, 2002). *A foreign-born person* is someone who was born outside the U.S. and its territories, except those who were born abroad to U.S.-citizen parents. Foreign-born persons also include those who have obtained U.S. citizenship through naturalization and people with various immigration statuses. On the other hand, individuals who were born in the U.S., Puerto Rico, and other territories, or born abroad to U.S.-citizen parents were referred to as *native-born* (U.S. Census Bureau, 2016). *Health equity* is a component of social justice and encompasses a state in which each person has

equal opportunity to be healthy (Benjamin, 2015). *Social justice* emphasizes the distribution of wealth and opportunities within and across societies (Wallace, 2008). *Health disparities* represent variabilities in health and health care as systems strive to achieve health equity (Benjamin, 2015).

Research Questions

The overarching goal of this non-experimental correlational study was to examine health care access among FBAs within the U.S. by drawing a comparison between various characteristics related to access to health care among foreign-born and native-born adults before and after implementation of major provisions of the ACA. The investigator sought to answer the following research questions:

1. What factors determine health care access for FBAs in the U.S?
2. Were there differences in access to health care services among native-born and FBAs during the periods before, during, and after implementation of the ACA?
3. Are the factors predicting health care access among the uninsured foreign-born population the same for their uninsured native-born counterparts?
4. Are there differences in health care access for FBAs in the U.S. from quarter to quarter during the year of implementation of major provisions of the ACA?

Research Hypothesis

The theoretical hypothesis for the current study, which was grounded in Andersen's behavioral model of health services utilization, was that there would be a statistically significant correlation between enabling resources and health care access measured by access indicators. The access indicators or outcome variables examined in this study included emergency room

(ER) visits, doctor visits, usual source of sick care, unmet health needs due to cost, and delayed medical care due to costs.

Specifically, this study examined the following research hypotheses:

Hypothesis 1: There is an association between indicators related to access (ER visits, doctor visits, usual source of care, unmet health needs, and delayed care because of costs) during pre- and post-ACA years, while controlling for predisposing and need factors.

Hypothesis 2: There is an association between health care access for FBAs compared with native-born adults during the implementation of major provisions of the ACA, after controlling for predisposing and need factors.

Hypothesis 3: Enabling resources are better predictors of health care access among FBAs in the U.S. than need and predisposing factors.

Hypothesis 4: The factors that determine health care access for uninsured FBAs in the U.S. differ from predictors of health care access for FBAs, before and after implementation of major provisions of the ACA, controlling for need factors.

Assumptions

Three assumptions or premises accepted without proof were identified based on the theoretical framework of the study:

1. Health care access is equitable when individual health needs have balanced the supply of care provided by health services.
2. Health care access for foreign-born population is disproportionate compared with their native-born counterparts.
3. Possessing insurance is a crucial determinant of health care access for most individuals in the U.S.

Propositions

Five propositions or verifiable predictions of a theoretical framework were developed for the current study:

1. Access to health care services was described using a variety of contexts in the literature as a critical measure for examining the dynamics of the organization, financing, and delivery of health care services.
2. Access to health care services reflects critical policy goals (Ricketts & Goldsmith., 2005).
3. Access to health care is equitable when demographic and need factors determine the use of health services (Chi & Handcock, 2014; Andersen, 1995; Aday & Andersen, 1974).
4. Inequitable access to health care occurs when enabling resources determined an individual's or a population's health care utilization (Chi & Handcock, 2014; Andersen, 1995; Aday & Andersen, 1974).
5. Application of Andersen's model could provide a critical pathway linking access and utilization to health outcomes among populations.

Significance of the Study

Findings from prior studies have suggested that foreign-born persons face significant barriers in accessing health care compared with native-born adults (Aroian, Wu, & Tran, 2005; Chi & Handcock, 2014; Derose, Escarce, & Lurie, 2007). Some of these barriers are associated with limited ability to speak English, low socioeconomic status, inability to afford health care, underemployment, and citizenship status (Chi & Handcock, 2014). The needs of newly arrived FBAs may be even more complicated because of job insecurities and unemployment, which limit access to employer-sponsored insurance coverage. Moreover, foreign-born individuals are more

likely than native-born adults to live in families with low incomes and lack insurance coverage (Kaiser Family Foundation [KFF], 2017).

Other factors encountered by both newly arrived and longer-staying FBAs are social isolation, discrimination, inability to access public assistance, and inability to navigate the U.S. health care system (Aroian, Wu, & Tran, 2005; Chi & Handcock, 2014; Deroose et al., 2007). The challenges in eliminating disparities in access to health care persist despite decades of innovative government and public programs at national and community levels. With 16.9% of the Gross Domestic Product or \$8,745 in health spending per capita in 2009 (Longest, 2016), the U.S. outspends other members of the Organization for Economic Co-operation and Development. Of concern were the persistent findings that many adults, including FBAs in the U.S., lacked the right to health care (National Quality Forum [NQF], 2017). Measures to address health and health care disparities remained a priority for stakeholders in the public and private sectors (Deroose et al., 2009; Wallace, 2008).

Significance for Nursing

Until the contextual and individual factors that influence access to health care among foreign-born populations are fully understood, implementation of programs to eliminate disparities may be ineffective. Foreign-born persons are a National Institute of Health (NIH) priority population. Therefore, by examining factors predicting health care access among FBAs, findings from this study can shift the focus of research to the development of programs that can potentially lead to more efficacious, cost-effective, and affordable care for vulnerable populations. Additionally, these findings can set the stage for the development of practice models for examining access to health care among health systems. This study could inform multi-level and interdisciplinary population health interventions that target underlying social,

economic, and environmental conditions to improve health outcomes among FBAs. By examining the effects of factors such as years of residence, English language proficiency, education, and other measures of acculturation, this study is in keeping with the goals of the NIH Immigrant Health Initiative to address how these factors influence health behaviors and outcomes among this vulnerable population.

Chapter Summary

This study examined factors predicting health care access for FBAs, contributing to science and population health by bringing to light predictors of access to health care among FBAs. In this chapter, the problem statement, significance of the study, operationalized definitions, theoretical assumptions, and propositions for Andersen's model were presented. Four aims including three specific aims and an exploratory aim of the research were explicitly stated, along with the study's hypotheses. In the following chapter, findings from the review of existing literature were presented in further detail.

CHAPTER 2

LITERATURE REVIEW

Evidence shows that foreign-born population accounted for more than 43 million or 13.5% of the United States (U.S.) population in 2016 (Artiga, Ubri & Foutz, 2017). Approximately 1.2 million new migrants enter the U.S. each year, most frequently from Mexico, the Philippines, China, India, Vietnam, El Salvador, and South Korea (Lebrun & Dubay, 2010). About one-third of foreign-born population falls into each of three main legal immigration status groups, namely naturalized citizens, lawful permanent residents or green card holders, and unauthorized or undocumented (Derosé et al., 2009). Additionally, foreign-born persons can either arrive in the U.S. with an immigrant-issued visa from their native country or as a temporary resident and later adjust their status while in the host country (Yeh et al., 2018). Numerous studies have examined health care disparities in the U.S. over the last four decades, but few have examined health care access for foreign-born persons (Pandey, Cantor & Lloyd, 2014).

Access to Health Care for Foreign-Born Adults in the U.S.

The National Academy of Medicine (formerly the Institute of Medicine [IOM]) defined access to health care as the appropriate use of personal health services to achieve the best possible outcomes and as a prerequisite to obtaining quality care (IOM, 2002). Barriers to health care access and utilization have previously been classified broadly on the individual, societal, organizational, structural, and health care provider levels (Cristancho et al., 2008). Few studies have examined the characteristics of foreign-born persons and the effects of these characteristics on access to health care (Livingston, Minushkin & Cohn., 2008).

Findings from theoretical and empirical studies over the past decade suggest that foreign-born adults (FBAs) face significantly disproportionate barriers in accessing health care compared with native-born adults (Chi & Handcock, 2014; Lee et al., 2016; Tarraf, Vega, & González, 2014). Health care access for FBAs is complicated, partly because of the heterogeneity of foreign-born population (Chi & Handcock, 2014; Derose et al., 2009; LaVeist, Gaskin & Richard, 2009; Wallace, 2008). Adding to this complexity is the fact that disparities in health care access are rooted in historical inequalities, which are perpetuated through stereotyping within the health care systems (Bowser, 2013). Multiple factors, including social marginalization, stigmatization, low socioeconomic status, limited access to societal resources, stress of the immigration process, and poor access to health care services, may have impact on the health of foreign-born population in the U.S. (Derose et al., 2009).

Andersen's behavioral model of health care utilization offers a systematic and multi-level approach that incorporates individual determinants of health services use. A primary assumption of Andersen's model is that an individual's inclination to use health services is a function of three dynamics, including his or her predisposing characteristics, enabling resources, and need factors. Predisposing factors are individual-specific characteristics and socio-cultural factors that exist before health services use. Need factors are perceived and evaluated health status that influences this use; while the enabling resources include structural and logistical aspects or resources that aid health services use (Aday & Andersen, 1974; Andersen, 1995; Chi & Handcock, 2014). To the researcher's knowledge, there has not been a comprehensive synthesis of evidence primarily focused on health care access for foreign-born persons in the U.S. since 2011. Therefore, the focus of this review was to examine evidence related to health care access for this disadvantaged group with the overarching goal of synthesizing evidence to guide further

research, policy, and practice. For this integrative review, the method provided by Whittemore and Knafl (Whittemore & Knafl, 2005) was used, and the synthesis of the reviewed materials was organized by the basic tenets of Andersen's model. Please refer to Table A-2 and Figure A-3 in the Appendix section for the graph and table showing technical details of article selection, review methodology, as well as an overview of articles reviewed for synthesis.

Access to Health Care and Predisposing Factors

Predisposing factors are person-level characteristics as well as socio-cultural factors that exist before health service use. They are factors that determine the likelihood of a person's use of health services (Andersen, 1995; Lee & Choi, 2009). Details of the predisposing factors examined in this review were provided below.

Age, Gender, and Sexual Orientation

An individual's age, gender, and sexual orientation have been shown to influence his or her access to and use of health services. For instance, Chung and colleagues found that older adult Korean Americans' perception of mistrust in the health system were based on preconceived cultural beliefs, which tended to influence participants' health-seeking behaviors (Chung, Seo & Lee, 2017). Moreover, Ye et al. (2012) found that Asian women are more likely to have a higher level of primary care access and utilization compared with Asian men.

Newer evidence shows that in general, there is limited understanding of health care access for foreign-born sexual minorities. In a recently published article, Gonzales and colleagues examined health care access among foreign-born population drawing comparisons by sexual orientation (Gonzales, Dedania & Driscoll, 2018). Classifying participants' responses regarding their sexual orientation, including lesbian, gay, bisexual, or "something else," the authors found no significant differences in insurance status, having a usual source of care, or

having had an office visit within the previous year among native-born and FBAs. However, compared with their heterosexual counterparts, sexual gender minority adults, whether native- or foreign-born, were more likely to have visited the ER in the previous year and reported financial barriers to accessing health care services, including pharmaceutical, dental, and mental health care needs (Gonzales et al., 2018). Additionally, foreign-born sexual minorities were more likely to have attained a higher education degree and have higher family incomes compared to foreign-born heterosexual adults.

Geographic Region of Birth and Racial/Ethnic Background

An individual's racial/ethnic background tends to shape his or her health-seeking behavior. Findings from prior studies showed that FBAs tend to underutilize preventative services, compared with native-born adults (Lee & Choi, 2009; Wilson, Wang & Stimpson, 2015). In the study by Wilson and colleagues, foreign-born persons were less likely than their native-born counterparts to utilize certain preventive eye care services. The authors opined the findings highlight the indications that FBAs need targeted interventions to reduce barriers to care and change their perceptions regarding necessary preventative care. In another study examining health-seeking behaviors by nativity and language preference, Massey et al. (2017) found that language preference and racial/ethnic background are significant drivers of health information seeking among foreign-born subpopulations. Specifically, within foreign-born subpopulations, Hispanic adults were less likely than other FBAs in the study to seek health information, less likely to access the Internet as the first source of health information, and more likely to rely on a health professional as the source of health information. Carreon and Baumeister (2015) found that foreign-born Filipinos and Vietnamese adults were less likely to get routine follow-up visits with a physician compared with foreign-born Chinese adults. Regression analyses between

foreign-born sub-groups and neighborhood segregation showed that Koreans and specific Asian populations had higher probability of getting a routine follow-up if they reside in a predominantly Asian neighborhood.

Access to Health Care and Need Factors

Need factors are perceived and evaluated factors that influence the use of health care services (Aday & Andersen, 1974; Andersen, 1995; Lee & Choi, 2009). In a study by Du and Xu (2016), the authors determined that racial and ethnic identity and immigration status contribute to delay in seeking health care among foreign-born population. Delayed use of medical care was negatively associated with self-rated physical and mental health status. An interesting finding from the study was that foreign-born Asians had the lowest self-rated physical health status, while foreign-born Latinos had the poorest self-rated mental health (Du and Xu, 2016). The authors argued that negative environmental factors in the host country, including structural inequalities and various discrimination and acculturation experiences, might play a role in shaping an individual's perception of his or her health status. In a community-based survey on foreign-born Asian Indians adults by Mehrotra et al. (2012), positive relationships were found between self-reported health perception, morbidity, utilization of specific preventative health services among middle-aged and socially advantaged foreign-born Asian Indians. Most of the study participants who had chronic health conditions reported having poor perception of health.

In another investigation aimed at examining disparities in access to health care services among Hispanics and Asians, Hasanali, De Jong & Graefe (2016) measured access to health care by perceived medical need and regular access to a physician. Hispanic adults in the study had lower perceptions of medical needs being met and were less likely to see a physician routinely, compared with Asian adults (Hasanali et al., 2016). Similarly, lower social integration and

English language proficiency had a negative influence on self-rated perceptions of health care quality and the ability to use health care services. In a prior study by Rodríguez, Bustamante & Ang (2009), undocumented Hispanic adults were less likely to self-report having received blood pressure and cholesterol level checks and less likely to receive health care information from physicians.

The use of health services varies among foreign-born population. For example, when examining the use of preventative services and annual checkups, Carreon and Baumeister (2015) found a stronger inverse association among Asian populations. Filipino and Vietnamese persons were less likely to seek preventative care compared with Chinese adults in the study. Comparing health services use by citizenship status, Tarraf and colleagues found increased use of emergency services among native-born and naturalized citizens compared with foreign-born and non-citizen adults (Tarraf et al., 2014). In a cross-national comparative study, Sidiqi, Zuberi & Nguyen (2009) compared health care access among insured and uninsured FBAs in the U.S. with insured FBAs in Canada. Findings from the study revealed a significant association between poor self-rated perception of health and higher odds of unmet medical needs in both countries.

Access to Health Care and Enabling Resources

Enabling resources include person-level circumstances or conditions that determine the availability of health service resources (Andersen, 1995; Lee & Choi, 2009). In the following section, we describe a constellation of enabling resources that may influence health care access for FBAs.

Citizenship Status

In general, noncitizens are more likely to be uninsured and have a relatively decreased ability to obtain health care versus citizens (Ye et al., 2012). Moreover, noncitizens are less

likely to use preventative health care services, more likely to lack a usual source of sick care, and less likely to seek timely preventative screenings (Lebrun & Dubay, 2010; Lee & Choi, 2009). Health care access barriers for undocumented or unauthorized foreign-born persons are well recognized in the literature. Specifically, unauthorized foreign-born persons do not qualify for federal health insurance coverage (KFF, 2017), and are only eligible for more distinct programs, such as emergency medical assistance under Medicaid, certain services in federally qualified community health centers and specific public health programs (Salami, 2017).

Duration of Residency in the U.S.

Evidence in the literature suggests that health care access varies within foreign-born subpopulations based on duration of U.S. residency. Access to the health care system for newly arrived FBAs is complicated because of job insecurities or unemployment, which may limit access to employer-sponsored insurance coverage (Hasanali et al., 2017). Moreover, foreign-born individuals are more likely than native-born persons to live in families with lower incomes and lack insurance coverage (KFF, 2017) and newly arrived foreign-born individuals tend to underutilize health care services (Chi & Handcock, 2014). Underutilization of health services among the newly arrived FBAs was linked to uninsured status, English language proficiency, access to financial resources, and familiarity with the health care systems (Chi & Handcock, 2014).

Prior studies have approached the presumed underutilization of health services among newly arrived FBAs as a phenomenon known as the ‘healthy immigrant effect.’ This effect assumes that the length of stay in the U.S. harms the overall health status of FBAs (Choi, 2006; Choi, 2012; Holmes, Driscoll & Heron, 2015). With this phenomenon, scholars posit that most foreign-born individuals have a relatively better health profile compared with native-born upon

initial arrival to the host country, but this health advantage dissipates over time. Scholars also explained that relative health advantage is likely associated with voluntary positive selection of foreign-born individuals, buffering of native culture, and legal barriers that prevent persons in poor health to enter the host country (Choi, 2006; Choi, 2012; Holmes et al., 2015). In the study by Holmes et al. (2015), the mortality advantage of foreign-born individuals of Hispanic origin was compared with those who were U.S.-born. The authors found that age of foreign-born person at the time of immigration, rather than the duration of residence in the U.S. was a mortality predictor, with a significant mortality advantage for those who migrated to the U.S. after age 24.

Choi (2012) investigated longitudinal data to test the ‘healthy immigrant effect’ using a combination of diagnoses with chronic health conditions, participants’ self-rated perceptions of health, and immigration status. The study included foreign-born older adults who had resided in the U.S. fewer than 15 years, those living in the U.S. 15+ years, and native-born older adults (Choi, 2012). The author found that the rate of mortality was relatively lower among foreign-born older adults residing in the U.S. fewer than 15 years and argued that the results partially supported the ‘healthy immigrant phenomenon.’ The findings from the study suggested that foreign-born older adults with less than 15 years of residence in the U.S. were healthier when health status was measured by the presence of chronic illness (Choi, 2012). In a subsequent study with a focus on self-rated health by Pandey and colleagues, FBAs who had resided in the U.S. for fewer than five years self-reported better health status, compared with native-born adults (Pandey et al., 2014). On the other hand, FBAs living in the U.S. between five and ten years rated their health as slightly better but overall significantly worse than native-born adults.

English Language Proficiency and Health Literacy

In 2016, about 26.1 million individuals or 9 percent of the U.S. residents, aged 5 and older had limited English language proficiency (Zong, Batalova, & Hallock, 2018). Prior studies have linked health literacy and English language proficiency to variations in health services utilization and overall health outcomes. Within diverse foreign-born ethnic/racial groups (i.e., Chinese, Latino, Korean, Vietnamese, and white European), limited English language proficiency carried a higher risk on health status than low health literacy, making these individuals a vulnerable group (Sentell & Braun, 2012). In a study by Khuu Lee & Zhou (2017), the number of years participants had lived in the U.S. had a positive relationship with levels of health literacy among the sampled Hmong Americans. The combined effects of low health literacy and linguistic barriers for older FBAs influenced perceptions regarding the level of mistrust in health care providers, resulting in untoward effects on treatment adherence (Chung et al., 2017). Sentell and Braun (2012) found that adults with low health literacy and limited English proficiency had a higher risk for poor health compared with those possessing higher health literacy and better English language proficiency.

In a qualitative study, Raymond-Flesch et al. (2014) examined health care needs and experiences of undocumented foreign-born young adults who qualified for the Deferred Action for Childhood Arrivals (DACA) program and were eligible for temporary legal status but excluded from the ACA's Medicaid expansion and Health Care Exchanges. The authors reported that inadequate health care literacy contributed to limited knowledge about participants' insurance coverage options, where to seek health care, and an overall ability to navigate the health care system (Raymond-Flesch et al., 2014).

Health Insurance Coverage

Health insurance enables access to health care services and protects against the high costs of care (Wilper et al., 2009). Findings from prior studies showed that foreign-born population faces complex challenges related to access to insurance, insurance coverage, and overall ability to finance health care (Yun et al., 2016). Bustamante and colleagues identified immigration status as a primary reason for being without insurance coverage (Bustamante et al., 2012). In a study examining barriers to chronic disease surveillance including cholesterol, diabetes, and hypertension screening among adults of Mexican origin, Salinas and colleagues found that possessing insurance increases the odds of participating in preventative screenings (Salinas et al., 2015). In another study by Reyes and Hardy (2015), there were significant insurance coverage differences between native-born and FBAs, after controlling for education, income level, and employment status. Research has shown that FBAs with insurance were twice as likely as their uninsured counterparts to use preventative health screening services, such as prostate exams, mammograms, and PAP smears.

The implementation of major provisions of the ACA in 2014 led to a significant historical gain in access to care by increasing health insurance coverage through the expansion of Medicaid, the creation of health insurance exchanges and marketplaces, and provision of federal tax subsidies for those with lower incomes (Joseph, 2017). However, as of November 2018, 14 states have not expanded Medicaid (KFF, 2018), leaving about 2.2 million Americans in the so-called Medicaid coverage gap.

In general, individuals in the Medicaid coverage gap have income levels that have placed them above Medicaid eligibility but below the lower recommended limit for Marketplace premium tax credits. Adults in the Medicaid coverage gap are more likely to face barriers to

accessing needed health services. Individuals in the Medicaid coverage gap would be eligible for Medicaid had their state chosen to expand these programs (Garfield, Damico & Orgera, 2018). Under the ACA, Medicaid eligibility is available to nearly all individuals with incomes at or below 138% of the federal poverty level (or \$28,676 for a family of three in 2018) (Garfield et al., 2018). Medicaid expansion filled the historical gaps in Medicaid eligibility for adults and was projected as a means of extending insurance coverage to lower-income adults (Garfield et al., 2018). Premium tax credits for Marketplace coverage also were intended to cover individuals with moderate incomes (Artiga et al., 2017; Garfield et al., 2018).

Income Level

Without adequate financial resources and insurance, the burden of medical bills could be overwhelming, leading to forgone medical needs. Reyes and Hardy (2015) found that socioeconomic status was crucial in shaping access to health insurance coverage. In another study, Salinas and colleagues found that foreign-born Hispanic adults with incomes greater than \$40,000 had a higher rate of participating in screenings than those with lower incomes (Salinas et al., 2015). Foreign-born adults with lower incomes who entered the U.S. after the enactment of the Welfare Reform Act of 1996 were more vulnerable to being uninsured given their ineligibility for public health benefits, such as Medicaid, during the first five years of residence in the U.S (Joseph, 2017).

U.S. Region of Residency

The geographic distribution of the uninsured population who fall within the Medicaid coverage gap reflects both regional variations in the reception by state legislatures and governors, of the availability of Medicaid expansion via the ACA. According to Garfield and colleagues, compared with other regions of the U.S., the South has higher numbers of poor and

uninsured adults, higher uninsured rates, and more limited Medicaid eligibility, accounting for most of the states that have not expanded Medicaid (Garfield et al., 2018). As a result, about 90% of individuals in the Medicaid coverage gap, including both native-born and FBAs reside in the South. Moreover, ethnic minorities were disproportionately represented among the poor and uninsured adults in the coverage gap (Artiga et al., 2017).

Historically, the safety net clinics and hospitals have traditionally served the uninsured and medically underserved populations (Liebert & Ameringer, 2013). However, this system has been overstretched in recent years given limited funding and resources, as well as increasing demand for services (Artiga et al., 2017). Findings from recent studies show that further measures are needed to address regional disparities in access to health care, health insurance coverage, and overall health care outcomes among disadvantaged and vulnerable populations (Garfield et al., 2018).

Summary of Selected Articles Reviewed

Access to health care empowers a person to use health care services (Adegboyega & Hatcher, 2015). Current review identified multifaceted barriers and facilitators determining health care access for foreign-born populations in the U.S. It is worth mentioning that there are some commonalities in the factors that influence access to health care for both native-born and FBAs. Regardless of country of origin, factors including possession of health insurance, income level, and having a usual source of care influence access to and utilization of health care services.

Access to health services in the U.S. has been measured in prior studies using various indicators (Lee & Choi, 2009) and sometimes depend on the type and availability of health insurance coverage (Liebert & Ameringer, 2013). Whereas other scholars argue that immigration status is the primary driver of the ability to obtain and afford health insurance. For instance,

undocumented foreign-born individuals who had resided in the U.S. for more than ten years were more likely to be uninsured compared with legally present foreign-born and native-born adults.

Health insurance remains a crucial financial determining factor of whether an individual sees a physician. The ACA was projected to extend insurance coverage. Despite historical gains in insurance coverage among various populations under the ACA, some foreign-born persons continue to experience significantly disproportionate challenges in accessing health care (Derose et al., 2009; Xu & Borders, 2008). Noncitizen adults are twice as likely as their native-born counterparts to be uninsured (Garfield et al., 2018). This review confirms that uninsured adults are also less likely to have a usual source of preventative care, have increased health needs, and may potentially forgo health care than the insured.

Overall, the implementation of the ACA has been credited for the decline in the number of uninsured Americans. However, millions of Americans remain uninsured or underinsured, and many are in the Medicaid coverage gap (Woolhandler & Himmelstein, 2017). In general, blacks were twice as likely as whites to fall into the Medicaid coverage gap that exists in the states that have not expanded Medicaid, mostly in the South (Artiga et al., 2017). Current review shows that foreign-born persons are less likely to use preventative services, compared with their native-born counterparts. Within foreign-born subpopulations, Filipinos and Vietnamese origin are less likely to have a usual source of preventative care.

Andersen's model was used to further classify barriers and facilitators of health care access. For foreign-born persons, factors such as age, gender, marital status, education, sexual orientation and geographic location at birth are vital predisposing factors that determine health care access and utilization. The need factors highlighted in this review include perception of health status and self-rated unmet health care needs. This review shows that foreign-born

persons' perception of health status, as well as the level of trust in the health systems, determines overall attitude towards health services use. Regarding enabling resources, this review further confirms the significance of insurance and immigration status, and duration of U.S. residency as essential drivers of health care access among foreign-born population. English language proficiency, income level, citizenship status, and U.S. region of residence are vital elements to consider when examining health care access for foreign-born persons.

Pandey and colleagues opined that certain policies, such as the Welfare Reform Act of 1996 are the origin of some of the health care access challenges experienced by some foreign-born populations (Pandey et al., 2014). As a result of such legal and regulatory policies, some foreign-born subgroups including lawfully-present FBAs with fewer than five years residency, noncitizens, and unauthorized foreign-born persons are currently ineligible for federal benefits including Medicaid (Joseph, 2017). Even when eligible, lawfully present FBAs with limited understanding of the health systems may not know how to access resources needed to apply for these health services benefits. Others start the application process but do not complete it (Bowser, 2013; Pereira et al., 2012). Factors contributing to the relatively low application and participation rates among eligible FBAs include language, literacy, and cultural barriers; the complexity of the application process and eligibility rules; climates of fear and mistrust; and challenges related to transportation or logistics.

Policy, Practice, and Research Relevance

The factors identified in the evidence reviewed provided a strong basis for examination for practice, research, and policy implications. Specifically, underutilization of preventative services among uninsured noncitizen adults may constitute challenges when considering timeliness in diagnosing and treatment of chronic conditions to prevent complications. Inequities

in health care access among underserved populations should be considered a significant public health challenge. The landmark 2002 IOM report on the effects of possessing insurance coverage on the health status of U.S. nonelderly adults revealed that the uninsured tended to have poorer health status and die younger. The report also highlighted that having adequate insurance coverage could decrease mortality (Woolhandler & Himmelstein, 2017).

While many studies have looked at health care access for foreign-born persons directly, less attention has been given to the factors predicting health care access for FBAs with comparison before and after the ACA. It is therefore unclear if there are connections between foreign-born specific elements examined in this review and overall health care outcomes relative to implementation of the ACA. Thus, this study investigated factors that best predict health care access for this population in the pre-and post-ACA periods.

Chapter Summary

Review of evidence presented in this chapter highlighted the findings from available literature regarding health care access for the FBAs in the U.S. Factors contributing to health care access barriers have been explained, and interventions have been suggested. Both qualitative and quantitative studies were presented, and some had theoretical underpinnings for the interventions chosen for the study. The results from both theoretical and non-theoretical evidence indicated that health care access for the FBAs is multifaceted. Evidence from existing literature underscores opportunities that exist in examining factors that predict healthcare access among the most vulnerable. Review of existing literature showed that FBAs face significant barriers in accessing health care in the U.S. Details and specifics about methods and approach in this study was provided in the Methods section.

CHAPTER 3

RESEARCH METHOD

The purpose of this study was to examine factors that predict health care access among foreign-born adults (FBAs) within the U.S. The study used data from the National Health Interview Survey (NHIS) from 2013 to 2015 to describe differences and factors driving health care access for FBAs during the periods pre-ACA (2013 and 2014) and post-ACA (2015). This chapter presented the following study elements: data source, study design, research hypothesis, analytical variables, sample, data analysis, study limitations and strength, and ethical considerations.

Data Sources

Data for the current study was obtained from the National Health Interview Survey (NHIS); a national survey in which data related to behavioral, demographic, and socioeconomic characteristics, as well as morbidity, health, and health care, are collected for adults and children in the U.S. using in-person interviews (Singh, Alfonso & Michael, 2013). As one of the longest-running annual federal health surveys, the NHIS uses a cross-sectional multi-stage cluster sample design and is representative of the civilian, noninstitutionalized population of the U.S. The NHIS was first implemented in 1957 and variables related to foreign-born adults (FBAs) were included for the first time in 1976 (Singh et al., 2013). The long-term nature of the survey, along with characteristics such as the large sample size, extensive sociodemographic data, and data related to health and morbidity set the NHIS apart from state-level or other nationally representative datasets. Data from the NHIS are used extensively throughout the U.S. Department of Health and Human Services to monitor trends in morbidity. As of 2018, the NHIS was a leading primary

source of information on the health status of the U.S. population and one of the critical data collection programs of the National Center for Health Statistics.

Study Design

The primary goal of this study was to examine factors predicting health care access among FBAs in the U.S. The current study characterized changes in health care access for the native- and FBA populations before, during, and after implementation of major provisions of the Patient Protection and Affordable Care Act (ACA). Initial open enrollment in the individual health insurance marketplace created by the ACA began in October 2013. In 2014, the individual mandate requiring U.S. citizens without health insurance to pay a tax penalty was implemented (Artiga et al., 2017). Moreover, insurance companies could no longer deny coverage based on preexisting conditions and federally funded Medicaid coverage was expanded to cover individuals earning up to 138% of the federal poverty level in certain states as of 2014 (Artiga et al., 2017; Garfield et al., 2018). Factors that predict health care access and utilization for FBAs in the U.S. were examined for both the insured and uninsured using data obtained from the NHIS from 2013 to 2015.

Research Hypotheses

The current study examined the following research hypotheses:

Hypothesis 1: There is an association between indicators related to access (ER visits, doctor visits, usual source of care, unmet health needs, and delayed care because of costs) during pre- and post-ACA years, while controlling for predisposing and need factors.

Hypothesis 2: There is an association between health care access for FBAs compared with native-born adults during the implementation of major provisions of the ACA, after controlling for predisposing and need factors.

Hypothesis 3: Enabling resources are better predictors of health care access among FBAs in the U.S. than need and predisposing factors.

Hypothesis 4: There is a significant difference in health care access between uninsured FBAs in the U.S. compared with native-born adults in the periods before and after the implementation of major provisions of the ACA, after controlling for predisposing and need factors.

Analytical Variables

The variables for the current study were chosen from the NHIS data, which are obtained through self-report by survey participants. In selected cases, a household member provided proxy information for respondents who were unable to participate during the interview. The definitions, operationalization of variables by study aim, and data file sources for the current the study are shown in Table 1. As further detailed in the following sections, five dependent variables, eight independent variables, and eight covariates were selected from the NHIS datasets for each year. The independent variables and covariates were organized by the primary constructs of Andersen's model. Independent variables included enabling resources, while covariates included the predisposing and need factors.

Outcome Variables

The primary outcome variables of interest included commonly used indicators of access to primary and preventive health care, which were further organized by indicators for health services and affordability. Use of emergency room (ER) services, doctor (MD) visits, and whether respondents had a usual source of sick care were examined as measures of health care utilization while affordability was examined by respondents' reports of unmet needs and delayed care due to costs. These outcome variables were assessed using participants' responses to questions from the NHIS addressing (1) the number of times participants visited the emergency

room in the previous year (ER visit); (2) whether participants visited or talked with a doctor during the last year (doctor visit); (3) whether individuals had a usual place to go for health care when sick (usual source of sick care); (4) whether participants needed care but decided to forgo care due to costs (unmet needs due to costs); and (5) whether participants delayed care due to costs.

Details of data management, including re-coding and renaming variables and preparing the datasets for analysis, are provided in the data dictionary documentation in Table A-1 under the Appendix section. Briefly, responses to the question “number of times participants visited the ER in the previous year” was recoded as none to 0 = ‘no’ and 1 to 8 times as ‘yes’. Those who responded ‘no’ to the question “have you seen or talked to a general doctor, within the past 12 months” were recoded as ‘no.’ Similarly, those who responded ‘no’ to the question; “is there a place that you usually go to when you are sick or need advice about your health?” were recoded as ‘no’, while those who responded ‘yes’ or ‘there is more than one place’ were recoded as ‘yes’.

Indicators of affordability, including unmet needs because of costs based on responses to the question “during the past 12 months, has medical care been delayed because of worry about the cost? (excludes dental care)” were re-coded as ‘no’ for those who responded ‘no’. Another measure of affordability examined was delayed care because of costs, with responses to the question; “during the past 12 months, was there any time when {person} needed medical care but did not get it because {person} couldn't afford it?” were recoded as ‘no’ for those who responded ‘no’. For all variables in the current study, those who refused to respond to a question, those who responded, ‘don’t know’, and those for whom the question was not ascertained were removed from the study dataset using casewise deletion across all three years of data. Casewise deletion was best suited to handle missing data compared with imputation methods given the

complexity of the data collection procedures used in the NHIS, which included strata and weighting variables.

Independent Variables

The independent variables for the current study represented the enabling resources of Andersen's model. Duration of residency was recoded as $\leq$ five years, 5–15 years, or $\geq$ 15 years. Citizenship status was recoded as citizen or non-citizen. Responses to the question “what kind of health insurance or health care coverage {do/does} {person} have?” were recoded as insured or uninsured. English language proficiency was recoded as very high, high, and low. U.S. region was categorized as Northeast, Midwest, West, or South. Respondents' highest levels of education were recoded as less than high school or GED, high school diploma, or college degree. Employment was recoded as employed or unemployed, while the ratio of the poverty threshold was recoded to $\leq$ 100%, 100–200%, or $>$ 200% of the federal poverty line (FPL).

Covariates

Regarding the predisposing factors, age was recoded as $\leq$ 34, 35 to 54, 55 to 64, or $\geq$ 65 years. For the current study, the 35 to 54-year-old group were classified as the middle-aged adult group, while the 55 to 64-year-old group as the older adult group based on previously used categories defined by the Centers for Disease Control and Prevention (KFF, 2017). Gender was coded as male or female. Marital status was recoded as married or partnered or not married or partnered (i.e., single, divorced, widowed, or separated).

Race variable was recoded using the current U.S. Office of Management and Budget (OMB) standards (NHIS, 2017) as White, Black/African American, American Indian or Alaska Native (AIAN), Asian, or multiple races. The NHIS provided eleven categories for the region of origin of FBAs, including Central America, Mexico, South America, Caribbean Islands, Europe,

Russia, Africa, the Middle East, India, Asia, South East Asia, and elsewhere. Region of origin categories was further collapsed and recoded based on previously used definitions and groupings of the regions of the world by the World Health Organization (WHO, n.d) to reduce limited cell counts. The recoded categories were the Americas (Mexico, Central America, Caribbean Islands, South America), Europe (including Russia and former USSR areas), Africa, Eastern Mediterranean (including the Middle East), Asia (including the Indian Subcontinent), and elsewhere.

Three need factors were examined in the current study. Self-rated perception of health was assessed with responses to the question “would you say your health, in general, is excellent, very good, good, fair, or poor?” This variable was coded as excellent, very good, good, and poor/fair. Functional limitations were coded as yes or no. A separate variable for chronic illness status was computed from a combination of seven disease conditions, with responses to the question “has a doctor or other health professional ever told you that you have...” for the conditions hypertension, cholesterol problems, diabetes, asthma, COPD, stroke, heart disease, or diabetes. The computed variable was coded ‘yes’ if a respondent reported one or more of the chronic conditions, and no if the respondent reported none of these conditions.

Study Sample

Native-born adults were defined as those who answered ‘yes’ to the question “were you born in the U.S.?” while FBAs were defined as those who responded ‘no’ to the same question. Because the NHIS uses complex stratified sampling, application of ordinary squares methods would create biased sampling and potential inaccuracy. In preparation for analyses, weighted maximum likelihood estimation for complex sampling data plan was computed for each study year (2013 to 2015) in SPSS using weighting variables provided in the dataset.

A power analysis was conducted to determine the minimum sample size necessary to assess the influence of predisposing, enabling, and need factors on access to health care among FBAs. The sample size for this study was determined based upon a logistic regression model (Friedman, Furberg, & DeMets, 2010; Pals et al., 2008). The calculation was based on widely accepted conventions for statistical power (0.80) and level of significance ($\alpha=0.05$) using two-tailed tests. Based on the work of Campbell and Alexander (2004) and McCue and Thompson (2005; 2006), an estimated effect size of 0.40 was used for the relationship of enabling variables and access to health care. Using G*Power version 3.1.9.2 (Faul, Erdfelder, Lang & Buchner, 2007) and applying variance correlations within the G*Power analysis (Demidenko, 2007), a sample of 491 from each year of the NHIS was required. Given that there were a total of 5,493 FBAs (unweighted) included in the full sample, with 1,139 in the NHIS in 2013, 2,234 in 2014, and 2,120 in 2015; there was enough power to detect variations in access to health care within this population.

Data Analysis

Tests for significance of coefficients and model fit were conducted using statistical significance at $p < 0.05$ for all analyses, using SPSS 23 version. The dependent, independent, and covariate variables were obtained from the Sample Adult and Person files, which are person-level files within the NHIS dataset. For each study year, these two person-level files were merged using the Household Serial Number (HHX), Family Sequence Number (FMX), and Person Sequence Number (FPX) variables. The final weight variable (WTFA), which was based on recommendations to NHIS data users by the CDC was applied to the analyses. For each year, the final weight variable contains the post-stratification adjustments by age, race/ethnicity, and sex using Census Bureau population control totals. With this approach, a generalizable sample

that was equal to the original sample size and representative of the population was created. In preparation for binary logistic regression analysis, all categorical variables with three or more response categories were dummy coded into a separate yes/no dichotomous variables.

For Aim 1 and the Exploratory aim, descriptive statistics were generated for both native-born adults and FBAs. Separate chi-square tests were calculated for comparisons between groups (FBAs and native-born adults) for each dependent variable and predisposing, enabling, and need factors. For Aims 2 and 3, separate descriptive statistics were calculated to characterize FBAs. Logistic regression modeling was used to obtain the unadjusted odds ratios for the total effects of key independent variables and covariates on access to care. Logistic regression has become a widespread tool in analyzing categorical or dichotomous responses (Santos & Barrios, 2017). In addition to its less stringent assumptions and interpretability, logistic regression modeling supports the selection of essential predictors or explanatory variables (Santos & Barrios, 2017).

Table 1: Summary of Study Variables, Aims, and Data Sources

Concepts	Definition	Variables/ Categories	Variables by Aims	NHIS File
Predisposing Factors	Demographic characteristics that exist before health services use.	• Age: 35–54, 55–64 • Gender: female, male • Marital/Partner Status: married/partnered, not married/partnered • Race: White, Black/African American, American Indian or Alaska Native (AIAN), Asian, Multiple • Region of origin: Americas, Europe, Africa, Eastern Mediterranean, Asia, and Elsewhere	Aims 1, 2, 3, & secondary aim: Covariates	Person File
Enabling Resources	Structural, logistical aspects, or resources that aid health services use	• Duration of residency: ≤ 5 yrs., 5–15 yrs., ≥ 15 yrs. • Citizenship Status: citizen, noncitizen • Language Proficiency: Very high, high, low • U.S. Region: Northeast, Midwest, South, West • Income: categories based on federal poverty line ranges for 2013–2015 • Education: <high school [HS], HS/GED, college • Insurance status: insured, uninsured • Employment status: employed, unemployed	Aim 1 & secondary: Covariates Aim 2 & 3: Independent variables	Person & Family Files
Need Factors	Perceived/evaluated factors that influence health care services use	• Self-rated perception of health: Excellent, very good, good, fair/poor • Functional Limitations: yes, no • Chronic Illness (hypertension, stroke, dyslipidemia, diabetes, asthma, and heart disease): yes, no	Aims 1, 2, 3 & secondary aim: Covariates	Person File
Access and Utilization of Health Care	A point in health systems where consumers' needs meet the supply of the professional health system	• Usual place to go for health care when sick? yes, no • Visit a general doctor (previous year)? yes, no • ER Visit (previous year)? yes, no • Needed care but treatment forgone due to cost? yes, no • Medical care delayed due to cost? yes, no	Aims 1, 2 & 3: Dependent variables	Person and Sample Adult Files

The two assumptions examined for the chi-square test of independence were as follows:

- (1) the independent/covariate variables and dependent variables are ordinal or nominal level; and
- (2) the independent/covariate variables and dependent variables consisted of two or more independent groups.

Three assumptions were assessed before proceeding with the logistic regression model: the dependent variable is dichotomous, independence of observations, and mutually exclusive categories. Chi-square goodness of fit was requested in SPSS to assess model fit and estimates of pseudo- R^2 describing the goodness of fit for the logistic model were examined.

Effects of the explanatory variables on the dependent variable were analyzed using complex sampling logistic regression modeling, in which variables from each level (predisposing, need, and enabling resources) were added to the model in hierarchical sequence or blocks, resulting in computation of three sets of coefficients and explainable variance for each block. Variance inflation factors (VIF) were computed in the primary stage of the analysis, the square root of which indicated how much the standard error was inflated because of its correlations with other variables. VIFs should be <5 to safeguard against multicollinearity (Ishitani, 2011). For the current study, the highest VIF was 3.006.

Study Limitations and Strengths

The current study was subject to limitations that should be considered when interpreting the results. The study relied on the NHIS to closely examine the roles of individual-level and foreign-born related factors on access to health care. Data for the NHIS were collected using a cross-sectional design, which precluded any statistical conclusions about causal relationships over a period between the independent variables and access to health care among FBAs. The

cross-sectional design also prevents the ability to make inferences about the trajectories of FBAs over time; such relationships are better examined with a longitudinal dataset. Certain pertinent variables were unavailable in the NHIS dataset. Therefore, analyses in this study did not include factors such as cultural beliefs, the context of immigration, and self-perceptions of one's ability to navigate the U.S. health system.

Furthermore, smaller sample sizes among the uninsured adults by duration of U.S. residency necessitated merging of the newly arrived or those with fewer than five years duration of U.S. residency with those who had resided in the U.S. for five to 15 years in 2013. This may be an indication that the CDC should consider oversampling certain ethnic minorities to avoid study interpretation biases.

Similarly, various community-level factors, including availability of services and neighborhood characteristics that may influence access and use of health care services were unavailable. Societal factors, such as self-perception of racism, stigmatization, and discrimination, as well as other contextual or institutional factors, such as health care and immigration policies, were not available. Although responses to the survey were collected in English, Spanish, or both languages, linguistically isolated households from non-Spanish speaking countries and those with limited English language proficiency, particularly the newly arrived FBAs, may have been underrepresented in the NHIS dataset. Acculturation was measured in the study through relatively simplified indicators including categorical measures of duration of stay in the U.S. and language proficiency; more sophisticated measures were unavailable. In this study, these proxy measures were concise and practical to quantify and were analogous to commonly used acculturation measures in prior studies of FBAs.

Despite the limitations noted above, the current study contributes to the existing literature on health access among FBAs by adding a comprehensive examination of the relationships between individual and foreign-born specific factors using a wide spectrum of indicators measuring access, health care utilization, and affordability before, during, and immediately after implementation of the major provisions of the ACA. Additionally, this is the first study to conduct comparative analyses from quarter-to-quarter within 2014, which was the year that most of the ACA provisions were implemented, as well as an examination of factors driving health care access among the uninsured for both native-born adults and FBAs.

Ethical Considerations

The current study was a secondary analysis of publicly available data, which lacked individual identifiers and was considered exempt from the review before use by the Institutional Review Board at the University of Tennessee, Knoxville (Figure A-1, in the Appendix section). The merging procedures performed on the person-level files did not involve identification of participants, and the researcher did not enhance the datasets in any way that resulted in potentially identifiable data. Data for the current study were maintained and stored on a password-protected and secure system (i.e., OneDrive).

Chapter Summary

The purpose of current study was to examine factors that predict health care access among FBAs within the U.S. The current study was guided by Andersen's model, including predisposing, enabling, and need factors (Andersen, 1995), and framed within the philosophical perspective of health equity and social justice. Data from the NHIS from 2013 to 2015 were examined to describe the relationships between health care access and certain sociodemographic

and enabling resources and need characteristics for FBAs in the U.S, compared with native-born adults during the periods pre-ACA (2013 and 2014) and post-ACA (2015). The rationale for selecting the dependent, independent, and covariates was described, as well as the chi-square tests of association and logistic regression analyses conducted. The outcomes of these statistical analyses are presented in Chapter 4.

CHAPTER 4

RESULTS

The purpose of this non-experimental, quantitative study was to examine factors that predict health care access among foreign-born adults (FBAs) in the U.S. The study was guided by the basic tenets of Andersen's model. Individually, an assessment was done regarding the impact of enabling resources on five dependent variables: emergency room (ER) visits, doctor visits, usual source of sick care, forgoing care or unmet needs, and delaying care because of costs. The research hypotheses of the current study along with the results by study aim are presented. This chapter concluded with a summary of significant findings.

Research Hypotheses

In the current study, four hypotheses were tested to examine the relationships between foreign birth and differences in health care access before and after implementation of major provisions of the Patient Protection and Affordable Care Act (ACA) using data from the National Health Interview Survey (NHIS) from 2013 to 2015. Specifically, the current study examined the following hypotheses:

Hypothesis 1: There is an association between indicators related to access (ER visits, doctor visits, usual source of sick care, unmet health needs, and delayed care because of costs) during pre- and post-ACA years, while controlling for predisposing and need factors.

Hypothesis 2: There is an association between health care access for FBAs compared with native-born adults during the implementation of major provisions of the ACA, after controlling for predisposing and need factors.

Hypothesis 3: Enabling resources are better predictors of health care access among FBAs in the U.S. than need and predisposing factors.

Hypothesis 4: The factors that determine health care access for uninsured FBAs in the U.S. differ from predictors of health care access for FBAs, before and after implementation of major provisions of the ACA, controlling for need factors.

Demographic Characteristics

Characteristics of the Full Studied Sample

Demographic characteristics of native-born and FBAs in the sample across the three years of data from the NHIS are shown in Table 2.

Descriptive Analysis Findings by Demography

Middle-aged adults (35 to 54 years) made up most of the sample. Most of the sample reported being native-born. There were more male respondents in 2014 (65%) compared with 2013 (47%) and 2015 (47%). Roughly half reported being married or partnered (53% in 2013, 54% in 2014, and 53% in 2015). Within the full sample, about 80% of respondents across all three years identified as White. Most of the respondents lived in the South, had a college degree, were employed, and had incomes >200% of the federal poverty line based on household size.

Descriptive Analysis Findings by Access Indicators

In terms of visits to the ER, less than a quarter of the sample reported at least one ER during the previous 12 months visit across all three years (Table 2). Most respondents reported having visited a physician during the previous 12 months, with most of the sample (90%) having a usual source of care in the years preceding the ACA (2013 and 2014) as well as after implementation of the ACA (89% in 2015). Reports of unmet medical needs and delaying care because of costs were low across all three years of data. Most of the sample (~85%) were insured. Majority of respondents rated their health status as good or better, with less than a

quarter reporting functional limitation. However, roughly half reported being told by a health care provider that they had at least one chronic illness (e.g., hypertension, stroke, heart disease, asthma, COPD, cholesterol problems, or diabetes).

A chi-square test of association (χ^2) was performed to assess differences between years (2013 to 2015; Table 3). Per recommendations from the National Center for Health Statistics (NCHS), multiple files within each NHIS year were merged before data sets were combined sequentially through the recommended process of concatenation. Unweighted values are presented because the NHIS data lacked variable weighting recommendations for merged multi-year datasets without pooling. For consistency, unweighted values were used for all χ^2 analyses in the current study. Overall, there were statistically significant differences by year and number of ER visits, doctor visits, having a usual source of care, having unmet needs, and delaying care ($p < 0.001$). However, there were no differences by nativity (i.e., native-born versus FBAs).

Characteristics of Foreign-born Adults in the Sample

Demographic characteristics of the FBAs in the sample by each year 2013 to 2015 are presented in Table 4.

Descriptive Analysis Findings by Demography

Most of the FBAs in the studied sample were middle-aged males who were married or partnered and identified as White. Roughly half reported their country of origin as the Americas (Mexico, Central America, Caribbean Islands, South America). The majority reported living in the U.S. for more than 15 years, being U.S. citizens, and speaking English proficiently. Most of the respondents resided in the South and reported having completed a college degree. The majority reported an income level above the FPL.

Table 2: Demographic Characteristics of Full Sample

Outcome Variables	Label	Count (2013)			Count (2014)			Count (2015)		
		<i>Weighted</i>	<i>Unweighted</i>	%	<i>Weighted</i>	<i>Unweighted</i>	%	<i>Weighted</i>	<i>Unweighted</i>	%
ER Visits	No	17,507,576	6,035	83	36,163,129	12,961	83	38,113,603	12,366	82
	Yes	3,487,519	1,243	17	7,196,928	2,596	17	8,557,935	2,838	18
Doctor Visits	No	6,492,281	2,234	31	12,136,231	4,420	28	13,573,092	4,540	29
	Yes	14,502,814	5,044	69	31,223,826	11,137	72	33,098,446	10,664	71
USOC	No	2,163,666	807	10	4,339,672	1,653	10	5,353,601	1,842	12
	Yes	18,831,429	6,471	90	39,020,385	13,904	90	41,317,937	13,362	89
Unmet Need	No	18,831,522	6,524	90	39,288,542	14,044	91	42,659,050	13,806	91
	Yes	2,163,573	754	10	4,071,515	1,513	9	4,012,488	1,398	9
Delayed Care	No	18,206,098	6,311	87	38,036,176	13,575	88	41,428,567	13,431	89
	Yes	2,788,997	967	13	5,323,881	1,982	12	5,242,971	1,773	11
<i>Need Factors</i>										
Health Perception	Excellent	5,158,491	1,796	25	11,131,986	3,780	26	11,716,402	3,724	25
	Very Good	6,777,266	2,256	32	14,031,257	4,956	32	14,990,743	4,732	32
	Good	5,636,515	1,976	27	11,630,560	4,328	27	13,017,240	4,300	28
	Fair/poor	3,422,823	1,250	16	6,566,254	2,493	15	6,947,153	2,448	15
Functional Limitations	No	17,159,426	5,935	82	35,927,410	12,825	83	38,570,396	12,471	83
	Yes	3,835,669	1,343	18	7,432,647	2,732	17	8,101,142	2,733	17
Chronic Illness	No	9,474,110	3,306	45	17,846,406	6,421	41	19,980,338	6,540	43
	Yes	11,520,985	3,972	55	25,512,068	9,134	59	26,691,200	8,664	57

Note: USOC = Usual Source of Care

Table 2: Demographic Characteristics of Full Sample (Continued)

Outcome Variable		Count (2013)			Count (2014)			Count (2015)		
	Label	Weighted	Unweighted	%	Weighted	Unweighted	%	Weighted	Unweighted	%
Predisposing Factors										
Age	35–54	13,792,730	4,779	66	28,168,706	10,228	65	30,478,721	9,974	65
	55–64	7,202,365	2,499	34	15,191,351	5,329	35	16,192,817	5,230	35
Birth Origin	NB	17,358,701	5,784	83	35,788,487	12,495	83	38,447,777	12,112	82
	FB	3,636,394	1,494	17	7,571,570	3,062	18	8,223,761	3,092	18
Gender	Male	9,830,130	3,290	47	28,168,706	7,005	65	22,008,496	6,948	47
	Female	11,164,965	3,988	53	15,191,351	8,552	35	24,663,042	8,256	53
Marital Status	M/P	11,073,512	3,736	53	23,412,357	8220	54	24,723,681	7,900	53
	Not M/P	9,879,313	3,529	47	19,868,536	7312	46	21,852,516	7,279	47
Race	White	16,702,220	5,450	80	34,776,143	12,006	80	37,205,621	11,651	80
	Black	2,726,869	1,144	13	5,545,101	2,258	13	6,085,389	2,226	13
	Asian	180,916	94	1	316,326	160	1	413,261	187	1
	AIAN	1,064,708	449	5	2,109,541	863	5	2,242,981	854	5
	Multiple	320,382	141	2	612,946	270	1	724,286	286	2
Enabling Factors										
Insurance	No	3,151,868	1,169	15	5,117,487	2,043	12	4,817,473	1,768	10
	Yes	17,843,227	6,109	85	38,242,570	13,514	88	41,854,065	13,436	90
U.S. Region/ Location	Northeast	3,679,360	1,229	18	7,446,871	2,550	17	8,211,237	2,553	18
	Midwest	4,873,941	1,455	23	10,315,093	3,302	24	11,010,864	3,121	24
	South	7,890,155	2,700	38	16,314,692	5,465	38	17,219,123	5,217	37
	West	4,551,639	1,894	22	9,283,401	4,240	21	10,230,314	4,313	22
Education	<HS	2,354,939	955	11	4,815,024	2,036	11	5,033,346	1,918	11
	HS/GED	4,940,162	1,743	24	10,404,945	3,869	24	10,742,864	3,654	23
	College	13,699,994	4,580	65	28,140,088	9,652	65	30,895,328	9,632	66
Employ	No	5,123,692	1,821	24	10,384,535	3,820	24	10,866,978	3,664	23
	Yes	15,871,403	5,457	76	32,975,522	11,737	76	35,804,560	11,540	77
FPL	<100%	2,678,572	1,086	13	5,702,480	2,321	13	5,917,864	2,206	13
	100 - 200	3,191,022	1,217	15	6,897,602	2,709	16	7,783,729	2,776	17
	>200%	15,125,501	4,975	72	30,759,975	10,527	71	32,969,945	10,222	71

Note: HS = High School; AIAN= American Indian And Alaskan Natives; FPL = Federal Poverty Line; M/P = Married/Partnered

Table 3: Differences in Interview Years by Access Indicators and Nativity

Outcome Variables		2013 (unweighted)			2014 (unweighted)			2015 (unweighted)			P*
		NB	FB	P [†]	NB	FB	P [†]	NB	FB	P [†]	
ER Visits ^b	No	4737	1298	<.001 ^a	10273	2688	<.001 ^a	9704	2662	<.001 ^a	<.001 ^a
	Yes	1047	196		2222	374		2408	430		
Doctor Visits ^c	No	1886	348	<.001 ^a	3808	612	<.001 ^a	3329	1211	<.001 ^a	<.001 ^a
	Yes	3898	1146		8687	2450		8783	1881		
USOC	No	510	297	<.001 ^a	1121	532	<.001 ^a	1268	574	<.001 ^a	<.001 ^a
	Yes	5274	1197		11374	2530		10844	2518		
Delayed Care	No	4991	1320	.036 ^a	10842	2733	<.001 ^a	10644	2787	<.001 ^a	<.001 ^a
	Yes	793	174		1653	329		1468	305		
Unmet Needs	No	5179	1345	.582	11235	2809	.002 ^a	10967	2839	.029 ^a	.019 ^a
	Yes	605	149		1260	253		1145	253		

[†]Within years; *Between across years; FB: Foreign-Born; NB: Native U.S.-Born;

^a<0.05; ^b Defined as visit or talked with a general physician in the 12 months preceding NHIS study year;

^c Defined as visit to the ER in the 12 months preceding NHIS study year; USOC: usual source of care.

Descriptive Analysis Findings by Access Predictors

Most FBA respondents reported having health insurance. Roughly 12% reported an ER visit across all three years. However, there was a sharp decline in doctor visits among this group from approximately 60% pre-ACA to only 18% post-ACA, though most FBAs reported having a usual source of sick care. Approximately 10% reported having unmet health needs (i.e., forgoing care) or delaying care because of costs. Most rated their health as being good or excellent, with fewer than 20% reporting functional limitations. However, a third to a half of FBAs reported having been told by a healthcare provider that they had at least one chronic illness, such as hypertension, stroke, heart disease, asthma, COPD, cholesterol problems, or diabetes.

Differences in Access Indicators

Chi-square tests were conducted to examine differences in access indicators by predisposing factors among the full sample (native- and foreign-born persons) as presented in Tables 5 through 9.

Differences in Emergency Room Visits by Predisposing Factors

As shown in Table 5, older adults and native-born adults more frequently reported ER visits. Moreover, women and respondents who were not married or partnered more frequently reported ER visits. White and AIAN respondents less frequently reported an ER visit compared with Black, Asian, and multiple race respondents.

Differences in Doctor Visits by Predisposing Factors

More middle-aged adults reported doctor visits in 2014 while older adults reported more visits in 2015 (Table 6). Similarly, more FBAs reported doctor visits pre-ACA, while more native-born adults reported visits post-ACA (Table 6). More men reported doctor visits pre-ACA, with more women reporting visits post-ACA (Table 6).

Differences in Usual Source of Sick Care by Predisposing Factors

The results of chi-square tests between usual sources of care and predisposing factors are represented in Table 7. Older adults, native-born adults, females, and respondents who were married or partnered more frequently reported having a usual source of sick care pre- and post-ACA (Table 7). Moreover, respondents who self-identified as Black/African American more frequently reported having a usual source of sick care compared with whites, Asians, AIANs, and those of multiple races in post-ACA (Table 7).

Differences in Unmet Needs by Predisposing Factors

As represented in Table 8, native-born adults reported more unmet needs at a constant rate in 2014 and 2015 while there were no differences in the report of unmet needs because of cost by native or foreign-birth in 2013 (Table 8). Females and respondents who were not married or partnered more frequently reported unmet needs, while Black/African Americans, Asians, and those of multiple races more frequently reported more unmet needs compared with whites and AIANs (Table 8).

Differences in Delayed Care by Predisposing Factors

As shown in Table 9, while there were no differences in reports of delayed care by age, native-born adults, females, and respondents who were not married or partnered, as well as those of multiple races, more frequently reported delayed care because of cost across all three years.

Table 4: Demographic Characteristics of Foreign-Born Adults

Outcome Variables	Label	Count (2013)			Count (2014)			Count (2015)		
		Weighted	Unweighted	%	Weighted	Unweighted	%	Weighted	Unweighted	%
ER	No ^a	2,447,177	1,004	88	4,864,357	1,972	89	5,022,333	1,857	87
Visits	Yes	324,738	135	12	609,040	262	11	726,914	263	13
Doctor	No ^a	1,117,087	474	40	2,020,789	875	37	4,740,011	1,766	82
Visits	Yes	1,654,828	665	60	3,452,608	1,359	63	1,009,236	354	18
USOC	No ^a	630,181	277	23	1,003,467	465	18	1,022,405	411	18
	Yes	2,141,734	862	77	4,469,930	1,769	82	4,726,842	1,709	82
Unmet	No ^a	2,537,420	1,029	92	5,055,124	2,063	92	5,348,062	1,963	93
Need	Yes	234,495	110	9	418,273	171	8	401,185	157	7
Delayed	No ^a	2,490,473	1,011	90	4,917,160	1,996	90	5,237,716	1,927	91
Care	Yes	281,442	128	10	556,237	238	10	511,531	193	9
Need Factors										
Health Perception	Excellent	853,878	342	30	1,684,542	661	31	1,855,281	673	32
	Very Good	827,007	336	30	1,722,014	669	31	1,833,448	637	32
	Good	820,326	347	30	1,594,606	702	29	1,645,097	634	29
	Fair/poor ^a	270,704	114	10	472,235	202	9	415,421	176	7
Functional	No ^a	2,653,616	1,093	96	5,230,768	2,138	96	5,571,910	2,052	97
Limitation	Yes	118,299	46	4	242,629	96	4	177,337	68	3
Chronic	No ^a	1,680,370	701	61	2,984,009	1,232	55	4,740,011	1,185	82
Illness	Yes	1,091,545	438	39	2,489,388	1,002	45	1,009,236	935	18

Note: ^aReference category in multivariate analysis; USOC=usual source of care

Table 4: Demographic Characteristics of Foreign-Born Adults Sample (Continued)

Outcome Variables	Label	Count (2013)			Count (2014)			Count (2015)		
		Weighted	Unweighted	%	Weighted	Unweighted	%	Weighted	Unweighted	%
<i>Predisposing Factors</i>										
Age	35–54	2,176,315	893	79	4,312,911	1,773	79	4,497,635	1,675	78
	55–64 ^a	595,600	246	22	1,160,486	461	21	1,251,612	445	22
Gender	Male	1,500,695	597	54	3,048,309	1,206	56	3,199,288	1,142	56
	Female ^a	1,271,220	542	46	2,425,088	1,028	44	2,549,959	978	44
Marital Status	M/P	927,169	392	33	3,743,765	1,515	68	3,783,572	1,369	66
	Not M/P	1,844,746	747	67	1,729,632	719	32	1,965,675	751	34
Race	White ^a	1,728,228	696	62	3,636,363	1,474	66	3,525,024	696	61
	Black	290,857	122	11	561,741	230	10	715,942	1,294	13
	Asian	34,802	19	1	42,112	19	1	42,234	264	1
	AIAN	681,710	285	25	1,179,131	482	22	1,362,414	24	24
	Multiple	36,318	17	1	54,050	29	1	103,633	502	2
Region of Origin	Americas ^a	1,487,303	676	54	3,004,670	1,367	55	2,963,470	1,229	52
	Europe	324,937	96	12	765,334	218	14	738,273	195	13
	Africa	136,429	48	5	231,966	92	4	329,826	117	6
	E. Med.	61,966	15	2	124,904	32	2	166,438	33	3
	Asia	673,365	279	24	1,161,289	466	21	1,366,223	492	24
	Elsewhere	87,915	25	3	185,234	59	3	177,653	52	3
<i>Enabling Factors</i>										
U.S Residence	≤5 yrs	97,474	44	4	247,598	102	5	226,814	102	4
	5 – ≤15yrs	644,347	275	23	1,149,345	457	21	1,183,056	457	21
	> 15 yrs ^a	2,030,094	820	73	4,076,454	1,675	74	4,339,377	1,675	75
Citizenship Status	No	1,179,644	514	43	2,363,733	1,049	43	2,299,437	928	40
	Yes ^a	1,592,271	625	57	3,109,664	1,185	57	3,449,810	1,192	60
Insurance	No	819,575	368	30	1,297,512	585	24	1,082,175	453	19
	Yes ^a	1,952,340	771	70	4,175,885	1,649	76	4,667,072	1,667	81
Language Proficiency	Very High ^a	1,341,882	501	48	2,732,054	1,008	50	3,059,631	1,008	53
	High	692,272	302	25	1,423,626	581	26	1,413,347	581	25
	Low	737,761	336	27	1,317,717	645	24	1,276,269	645	22

Table 4: Demographic Characteristics of Foreign-Born Adults Sample (Continued)

U.S. Region/ Location	Northeast	549,484	209	20	1,070,802	380	20	1,112,088	362	19
	Midwest	330,986	109	12	567,561	227	10	669,873	232	12
	South ^a	984,400	402	36	1,932,317	758	35	2,109,077	730	37
	West	907,045	419	33	1,902,717	869	35	1,858,209	796	32
Education	<HS	685,970	319	25	1,385,978	670	25	1,216,845	548	21
	HS/GED	545,225	229	20	1,040,854	450	19	1,120,342	435	20
	College ^a	1,540,720	591	56	3,046,565	1,114	56	3,412,060	1,137	59
FPL	<100%	309,970	151	11	712,589	337	13	625,227	278	11
	100 - 200	657,639	292	24	1,176,824	546	22	1,262,441	530	22
	>200 ^a	1,769,989	679	65	3,542,593	1,328	65	3,821,522	1,296	67

Note: ^aReference category in multivariate analysis; HS= High School; M/P= Married/Partnered; E. Med = Eastern Mediterranean; AIAN = American Indian and Alaska Natives; FPL = federal poverty line

Table 5: Differences in ER Visits by Predisposing Factors

Predisposing Factors	Label	2013				2014				2015			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Age (years)	35–54	84	17	3.7	.055	84	16	15.5	<.001 ^a	82	18	4.4	.036 ^a
	55–64	82	18			82	18			80	20		
Nativity	NB	82	18	20.8	<.001 ^a	82	18	54.9	<.001 ^a	80	20	57.9	<.001 ^a
	FB	87	13			88	12			86	14		
Gender	Male	85	15	16.5	<.001 ^a	85	15	30.1	<.001 ^a	83	17	21.5	<.001 ^a
	Female	81	19			82	18			80	20		
Marital/ Partner Status	M/P	86	14	57.6	<.001 ^a	87	13	165.3	<.001 ^a	85	15	151.8	<.001 ^a
	Not M/P	80	21			79	21			77	23		
Race	White	84	16	62.1	<.001 ^a	84	16	141.0	<.001 ^a	83	17	206.4	<.001 ^a
	Black	77	24			76	24			72	28		
	Asian	78	22			74	26			70	30		
	AIAN	92	9			91	9			90	10		
	Multiple	80	20			79	21			78	22		

^a< 0.05; values may not = 100% due to rounding up; M/P = Married/Partnered; FB = Foreign-born; NB = Native-born; AIAN American Indian or Alaska Natives

Table 6: Differences in Doctor Visits by Predisposing Factors

Variable	Label	2013				2014				2015			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Age (years)	35–54	30	70	.48	.489	28	72	8.1	.004 ^a	34	66	227.9	<.001 ^a
	55–64	31	69			30	70			22	78		
Nativity	NB	33	67	48.4	<.001 ^a	31	70	133.0	<.001 ^a	28	73	160.5	<.001 ^a
	FB	23	77			20	80			39	61		
Gender	Male	26	74	59.4	<.001 ^a	24	76	126.1	<.001 ^a	34	66	106.6	<.001 ^a
	Female	35	66			32	68			26	74		
Marital/ Partner Status	M/P	32	68	3.2	.073	29	71	.32	.569	29	71	5.0	.025 ^a
	Not M/P	30	70			28	72			31	69		
Race	White	33	67	66.0	<.001 ^a	30	70	110.9	<.001 ^a	30	70	9.7	.045 ^a
	Black	24	76			21	79			28	72		
	Asian	23	77			28	72			36	64		
	AIAN	20	80			21	79			33	67		
	Multiple	38	62			31	69			30	70		

^a< 0.05; values may not = 100% due to rounding up; M/P = Married/Partnered; FB = Foreign-born; NB = Native-born; AIAN American Indian or Alaska Natives

Table 7: Differences in Usual Source of Care by Predisposing Factors

Variables	Label	2013				2014				2015			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Age (years)	35–54	13	87	52	<.001 ^a	12	88	81	<.001 ^a	14	86	137	.001 ^a
	55–64	7	93			8	93			8	92		
Nativity	NB	9	91	147	<.001 ^a	9	91	183	<.001 ^a	11	90	152	<.001 ^a
	FB	20	80			17	83			19	81		
Gender	Male	14	86	59	<.001 ^a	14	86	177	<.001 ^a	16	84	223	<.001 ^a
	Female	9	92			8	92			9	92		
Marital/ Partner Status	M/P	9	91	33	<.001 ^a	9	91	67	<.001 ^a	10	90	81	.001 ^a
	Not M/P	13	87			13	87			15	85		
Race	White	11	89	9	.065	11	89	17	.002 ^a	12	88	12	.018 ^a
	Black	9	91			8	92			10	90		
	Asian	12	88			12	88			11	89		
	AIAN	13	87			11	89			13	87		
	Multiple	14	86			14	86			14	86		

^a< 0.05; values may not = 100% due to rounding up; M/P = Married/Partnered; FB = Foreign-born; NB = Native-born; AIAN American Indian or Alaska Natives.

Table 8: Differences in Unmet Needs by Predisposing Factors

Predisposing Factors	Label	2013				2014				2015			
		No (%)	Yes (%)	χ^2	<i>P</i>	No (%)	Yes (%)	χ^2	<i>P</i>	No (%)	Yes (%)	χ^2	<i>P</i>
Age (years)	35–54	90	10	.055	.815	91	10	1.265	.261	91	9	.796	.372
	55–64	90	10			90	10			91	10		
Nativity	NB	90	11	.303	.852	90	10	9.3	.002 ^a	91	10	4.77	.029 ^a
	FB	90	10			92	8			92	8		
Gender	Male	91	9	8.6	.003 ^a	92	8	24.1	<.001 ^a	92	8	12.2	<.001 ^a
	Female	89	11			89	11			90	10		
Marital Status	M/P	94	6	167	<.001 ^a	94	6	332.1	<.001 ^a	94	6	245	<.001 ^a
	Not M/P	85	15			86	14			87	13		
Race	White	90	10	14.9	.005 ^a	91	9	76.1	<.001 ^a	91	9	73.4	<.001 ^a
	Black	87	13			88	12			88	13		
	Asian	92	9			87	13			86	14		
	AIAN	92	9			96	5			96	4		
	Multiple	87	13			80	20			86	14		

^a< 0.05; values may not sum to 100% due to rounding up; M/P = Married/Partnered; FB = Foreign-born; NB = Native-born; AIAN American Indian or Alaska Natives

Table 9: Differences in Delayed Care by Predisposing Factors

Predisposing Factors	Label	2013				2014				2015			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Age (years)	35–54	87	13	1.2	.276	88	13	1.5	.223	89	11	1.8	.182
	55–64	86	14			87	13			88	12		
Nativity	NB	86	14	4.4	.036 ^a	87	13	13.7	<.001 ^a	88	12	12.2	<.001 ^a
	FB	88	12			89	11			90	10		
Gender	Male	88	12	10.2	.001 ^a	89	12	17.1	<.001 ^a	90	10	24.3	<.001 ^a
	Female	86	14			86	14			87	13		
Marital/ Partner Status	M/P	92	8	189.9	<.001 ^a	92	8	350.9	<.001 ^a	93	7	299.5	<.001 ^a
	Not M/P	81	19			82	18			84	16		
Race	White	87	13	10.9	.028 ^a	87	13	65.4	<.001 ^a	88	12	41.6	<.001 ^a
	Black	85	15			87	13			87	13		
	Asian	88	12			83	17			88	12		
	AIAN	90	10			93	7			95	5		
	Multiple	81	19			76	24			87	13		

^a< 0.05; values may not sum to 100% due to rounding up; M/P = Married/Partnered; FB = Foreign-born; NB = Native-born; AIAN American Indian or Alaska Natives

The results of chi-square tests assessing differences in access indicators and enabling resources are represented in Tables 10 to 14.

Differences in Emergency Room Visits by Enabling Resources

In Table 10, citizens and the uninsured more frequently reported ER visits. More respondents with high English language proficiency reported ER visits while those who resided in the West reported fewer ER visits (Table 10). Respondents with lower incomes (<100% FPL) and less formal education (high school diploma or less) more frequently reported ER visits from 2013 to 2015 (Table 10).

Differences in Doctor Visits by Enabling Resources

In Table 11, noncitizens and uninsured respondents more frequently reported doctor visits in 2013 and 2014 but less frequently in 2015. More respondents with high English Language proficiency reported more doctor visits in 2013 and 2014 but reported fewer visits in 2015 (Table 11). Respondents in the South more frequently reported doctor visits in 2014 and less frequently in 2015 (Table 11). Moreover, in 2013 and 2014, respondents who were very poor (<100 FPL) and had less formal education (high school diploma or less) reported more doctor visits while the wealthier (>200 FPL) respondents and those with a college degree reported more doctor visits in 2015 (Table 11).

Differences in Usual Source of Care by Enabling Resources

The results of differences in usual sources of care by enabling resources are represented in Table 12. Non-citizens, the uninsured, the very poor (< 100% FPL), those with less formal education (high school diploma or less), and respondents who did not speak English well less frequently reported having a usual source of care when sick (Table 12). Respondents who

resided in the Northeastern region more frequently reported having a usual source of care compared with those in the South and West (Table 12).

Differences in Unmet Needs by Enabling Resources

As shown in Table 13, while there were no differences in respondents' report of unmet needs by citizenship status in 2013 and 2014, citizens more frequently reported having unmet needs in 2015 (Table 13). Uninsured FBAs more frequently reported unmet needs in 2013 and 2014 and less frequently in 2015 (Table 13). Although there were no differences in unmet needs by English Language proficiency in 2014, respondents who spoke English well more frequently reported unmet needs because of cost in 2013 and 2015 (Table 13). Likewise, respondents who resided in the South with less formal education (high school diploma or less) and were very poor (<100% FPL) more frequently reported unmet needs across all three years (Table 13).

Differences in Delayed Care by Enabling Resources

Uninsured, less formally educated (high school diploma or less), and lower income (<200% FPL) respondents more frequently reported delayed care because of cost across all three years (Table 14). Moreover, respondents in the South and West more frequently reported delayed care because of cost in 2013, while there were no differences in 2014 and 2015 by U.S. region (Table 14).

Table 10: Differences in ER Visits by Enabling Resources

Enabling Resources	Label	2013				2014				2015			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Citizen	No	89	11	18.8	<.001 ^a	89	11	39.9	<.001 ^a	87	13	38.7	<.001 ^a
	Yes	82	18			83	17			81	19		
Insurance	No	88	13	20.7	<.001 ^a	88	12	44.6	<.001 ^a	83	17	4.3	.038 ^a
	Yes	82	18			83	18			81	19		
U.S. Region	Northeast	82	18	19.9	<.001 ^a	82	18	19.5	<.001 ^a	81	20	53.5	<.001 ^a
	Midwest	81	19			83	17			81	19		
	South	82	18			83	18			79	21		
	West	86	14			85	15			85	15		
Education	<HS	76	24	59.5	<.001 ^a	77	23	108.2	<.001 ^a	76	24	89.9	<.001 ^a
	HS/GED	80	20			81	19			79	22		
	College	85	15			86	14			84	17		
FPL (%)	<100	70	30	220.2	<.001 ^a	70	30	489.4	<.001 ^a	66	34	531.5	<.001 ^a
	100-200	78	22			78	22			76	24		
	>200	87	13			88	12			86	14		

^a < 0.05; Values may not sum to 100%, due to rounding up; HS = high school; FPL = federal poverty line; ^b Citizens include native-born and naturalized citizens

Table 11: Differences in Doctor Visits by Enabling Resources

Enabling Resources	Label	2013				2014				2015			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Citizenship ^b	No	22	78	25	<.001 ^a	17	83	99	<.001 ^a	49	51	274	<.001 ^a
	Yes	32	69			30	70			28	72		
Insurance	No	24	76	31	<.001 ^a	22	78	46	<.001 ^a	62	38	986	<.001 ^a
	Yes	32	68			29	71			26	74		
U.S. Region	Northeast	31	69	5	.151	28	72	12	.008 ^a	26	74	56	<.001 ^a
	Midwest	32	68			29	71			29	71		
	South	29	71			27	73			29	71		
	West	32	68			30	70			34	66		
Education	<HS	20	80	75	<.001 ^a	19	81	168	<.001 ^a	38	62	93	<.001 ^a
	HS/GED	29	71			24	76			32	68		
	College	34	66			32	68			27	73		
FPL (%)	<100	25	75	27	<.001 ^a	24	76	37	<.001 ^a	33	68	60	<.001 ^a
	100-200	28	72			26	74			35	65		
	>200	33	67			30	70			28	72		

^a < 0.05; Values may not sum to 100%, due to rounding up; HS = high school; FPL= federal poverty line; ^bCitizens include native-born and naturalized citizens

Table 12: Differences in Usual Source of Care by Enabling Resources

Enabling Resources	Label	2013				2014				2015			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Citizenship	No	30	70	258	<.001 ^a	24	76	309	<.001 ^a	27	73	318	<.001 ^a
	Yes	9	91			9	91			11	89		
Insurance	No	40	60	1191	<.001 ^a	38	62	1801	<.001 ^a	45	55	2070	<.001 ^a
	Yes	6	95			7	94			8	92		
U.S. Region	Northeast	7	93	49	<.001 ^a	6	94	83	<.001 ^a	8	92	61	<.001 ^a
	Midwest	10	90			10	91			11	89		
	South	11	89			11	89			13	87		
	West	15	85			13	87			14	86		
Education	<HS	19	81	87	<.001 ^a	16	84	123	<.001 ^a	19	81	164	<.001 ^a
	HS/GED	13	87			13	87			14	86		
	College	9	91			9	91			10	90		
FPL (%)	<100	18	82	136	<.001 ^a	15	85	175	<.001 ^a	18	82	164	<.001 ^a
	100-200	17	83			16	84			16	84		
	>200	8	92			8	92			10	90		

^a < 0.05; Total values may not sum to 100%, due to rounding up; HS = high school; FPL= federal poverty line; ^bCitizens include native-born and naturalized citizens

Table 13: Differences in Unmet Needs by Enabling Resources

Enabling Resources	Label	2013				2014				2015			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Citizenship	No	89	11	0.6	.448	90	10	0.03	.875	87	13	39	<.001 ^a
	Yes	90	10			90	10			81	19		
Insurance	No	68	32	696	<.001 ^a	71	29	983	<.001 ^a	83	17	4.3	.038 ^a
	Yes	94	6			93	7			81	19		
U.S. Region	Northeast	92	8	9.4	.024 ^a	92	8	26	<.001 ^a	81	20	54	<.001 ^a
	Midwest	90	10			91	9			81	19		
	South	89	11			89	11			79	21		
	West	89	11			91	9			85	15		
Education	<HS	85	15	48	<.001 ^a	86	14	69	<.001 ^a	76	24	90	<.001 ^a
	HS/GED	88	13			89	11			79	22		
	College	91	9			92	8			84	17		
FPL (%)	<100	77	23	432	<.001 ^a	81	20	777	<.001 ^a	66	34	532	<.001 ^a
	100-200	80	20			81	19			76	24		
	>200	95	5			95	5			86	14		

^a < 0.05; Values may not sum to 100%, due to rounding up; HS = high school; FPL= federal poverty line;

^bCitizens include native-born and naturalized citizens

Table 14: Differences in Delayed Care by Enabling Resources

Enabling Resources	Label	2013				2014				2015			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Citizenship	No	88	13	0.4	.529	88	12	1.5	.212	88	12	.8	.353
	Yes	87	13			87	13	6		88	12	6	
Insurance	No	65	35	565	<.001 ^a	65	35	103	<.001 ^a	67	33	92	<.001 ^a
	Yes	91	9			91	9	4		91	9	0	
U.S. Region	Northeast	89	11	8.4	.039 ^a	89	12	6.2	.103	89	11	3.0	.391
	Midwest	87	13			88	12			88	12		
	South	86	14			87	13			88	12		
	West	86	14			87	13			89	12		
Education	<HS	83	17	19.8	<.001 ^a	85	15	22.6	<.001 ^a	86	14	24.2	<.001 ^a
	HS/GED	85	15			86	14			87	13		
	College	88	12			88	12			89	11		
FPL (%)	<100	77	23	334	<.001 ^a	78	22	524	<.001 ^a	81	19	333	<.001 ^a
	100-200	76	25			78	22			82	18		
	>200	92	8			92	9			92	8		

^a < 0.05; Values may sum to 100%, due to rounding up; HS = high school; FPL= federal poverty line; ^bCitizens include native-born and naturalized citizens

Results of Chi-square test examining differences in access indicators, including emergency room visits, doctor visits, usual source of sick care, unmet needs due to cost, and delayed care due to cost by need factors were shown in Tables 15 to 19.

Differences in Emergency Room Visits by Need Factors

Respondents with poor health status, those with functional limitations, and those living with at least one chronic illness more frequently visited the emergency room (ER) (Table 15). The chronic illness examined included high blood pressure, high cholesterol, diabetes, stroke, chronic obstructive pulmonary disease (COPD), and heart disease.

Differences in Doctor Visits by Need Factors

Respondents who were in poor health status less frequently reported doctor visits pre-ACA, but more frequently in post-ACA, compared with those whose health status was good or better (Table 16). Respondents with at one chronic illness more frequently reported doctor visits post-ACA (Table 16).

Differences in Usual Source of Care by Need Factors

As shown in Table 17, respondents with poor health status, functional limitations, and at least one chronic illness in 2013 to 2015 more frequently reported having a usual source of sick care (Table 17).

Differences in Unmet Needs and Delayed Care by Need Factors

Respondents with poor health status, those with functional limitations, and those living with at least one chronic illness more frequently reported they either did not get needed care (Table 18) or delayed care because of cost across all three studied years (Table 19).

Table 15: Differences in ER Visits by Need Factors

Need Factors	Label	2013				2014				2015			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Perception of Health ^b	Excellent	92	8	539	<.001 ^a	92	8	1131	<.001 ^a	91	9	1235	<.001 ^a
	Very Good	88	13			89	11			88	12		
	Good	83	17			82	18			79	22		
	Fair/Poor	62	38			62	38			59	42		
Functional Limitation	No	88	12	552	<.001 ^a	88	12	1256	<.001 ^a	86	14	1096	<.001 ^a
	Yes	61	39			60	40			59	41		
Chronic Illness ^c	No	91	10	248	<.001 ^a	91	10	408	<.001 ^a	89	11	414	<.001 ^a
	Yes	77	23			78	22			76	24		

^a<0.05; ^bSelf-rated perception of health status; ^cChronic illness defined as presence of at least one of the following: hypertension, stroke, heart disease, asthma, COPD, cholesterol problems, or diabetes mellitus.

Table 16: Differences in Doctor Visits by Need Factors

Need Factors	Label	2013		χ^2	P	2014		χ^2	P	2015		χ^2	P
		No (%)	Yes (%)			No (%)	Yes (%)			No (%)	Yes (%)		
Perception of Health ^b	Excellent	28	72	19	<.001 ^a	27	74	39	<.001 ^a	38	62	269	<.001 ^a
	Very Good	31	69			29	71			31	69		
	Good	30	70			27	73			28	72		
	Fair/Poor	36	65			33	67			19	81		
Functional Limitation	No	29	71	34	<.001 ^a	27	73	94	<.001 ^a	33	67	281	<.001 ^a
	Yes	37	63			36	64			17	83		
Chronic Illness ^c	No	30	70	.73	.392	27	73	11	.001 ^a	42	58	798	<.001 ^a
	Yes	31	69			29	71			21	79		

^a<0.05; ^bSelf-rated perception of health status; ^cChronic illness defined as presence of at least one of the following: hypertension, stroke, heart disease, asthma, COPD, cholesterol problems, or diabetes mellitus.

Table 17: Differences in Usual Source of Care by Need Factors

Need Factors	Label	2013				2014				2015			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Perception of Health ^b	Excellent	12	88	17	.001 ^a	12	88	38	<.001 ^a	14	86	37	<.001 ^a
	Very Good	10	90			11	90			12	88		
	Good	13	87			11	89			12	88		
	Fair/Poor	9	91			7	93			9	91		
Functional Limitation	No	12	88	52	<.001 ^a	12	88	34	<.001 ^a	13	87	85	<.001 ^a
	Yes	6	95			6	94			7	93		
Chronic Illness ^c	No	17	83	189	<.001 ^a	16	84	333	<.001 ^a	18	82	363	<.001 ^a
	Yes	7	94			7	93			8	92		

^a<0.05; ^bSelf-rated perception of health status; ^cChronic illness defined as presence of at least one of the following: hypertension, stroke, heart disease, asthma, COPD, cholesterol problems, or diabetes mellitus.

Table 18: Differences in Unmet Needs by Need Factors

Need Factors	Label	2013				2014				2015			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Perception of Health	Excellent	96	4	331	<.001 ^a	97	3	725	<.001 ^a	96	4	619	<.001 ^a
	Very Good	94	6			94	6			94	6		
	Good	87	13			88	12			89	11		
	Fair/Poor	77	23			77	23			79	21		
Functional Limitation	No	92	8	212	<.001 ^a	93	7	562	<.001 ^a	93	7	374	<.001 ^a
	Yes	79	21			78	22			81	19		
Chronic Illness	No	92	8	46	<.001 ^a	93	7	100	<.001 ^a	93	7	77	<.001 ^a
	Yes	87	13			88	12			89	11		

^a<0.05; ^bSelf-rated perception of health status; ^cChronic illness defined as presence of at least one of the following: hypertension, stroke, heart disease, asthma, COPD, cholesterol problems, or diabetes mellitus

Table 19: Differences in Delayed Care by Need Factors

Need Factors	Labels	2013				2014				2015			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Perception of Health	Excellent	94	6	319	<.001 ^a	95	5	567	<.001 ^a	95	6	536	<.001 ^a
	Very Good	91	9			90	10			92	8		
	Good	84	16			85	15			86	14		
	Fair/Poor	73	27			75	25			77	23		
Functional Limitation	No	90	10	225	<.001 ^a	90	10	451	<.001 ^a	91	9	331	<.001 ^a
	Yes	74	26			75	25			78	22		
Chronic Illness	No	91	9	84	<.001 ^a	90	10	89	<.001 ^a	91	9	62	<.001 ^a
	Yes	83	17			85	15			87	13		

^a<0.05; ^bSelf-rated perception of health status; ^cChronic illness defined as presence of at least one of the following: hypertension, stroke, heart disease, asthma, COPD, cholesterol problems, or diabetes mellitus

Differences by Interview Timing in 2014

Chi-square tests were conducted to examine differences in access indicators by interview timing in 2014; the year during which major provisions of the ACA were implemented. The findings for differences in access indicators by predisposing factors and interview timing are presented in Tables 20 through 24.

Differences in Emergency Room Visits by Predisposing Factors and Interview Timing

While there were no differences in ER visits by age in the first quarter of 2014, older adults more frequently visited the ER for the remainder of the year (Table 20). The study's findings also showed that native-born adults, females, and respondents who were not married or partnered more frequently reported ER visits at a steady rate throughout 2014 (Table 20). Compared with whites and AIANs, respondents who identified as Black/African American, Asian, or multiple races more frequently visited the ER throughout 2014 (Table 20).

Differences in Doctor Visits by Predisposing Factors and Interview Timing

There were no differences in doctor visits by age in the first, second, and fourth quarter of 2014 (Table 21). However, middle-aged adults reported more doctor visits than older adults in the third quarter of 2014 (Table 21). Foreign-born adults and males more frequently reported doctor visits throughout 2014. Whites and those of multiple races less frequently reported doctor visits compared with Blacks/African Americans, Asians, and AIANs (Table 21).

Differences in Usual Source of Care by Predisposing Factors and Interview Timing

As shown in Table 22, older adults, native-born adults, females, and respondents who were married or partnered frequently reported having a usual source of sick care in 2014. Blacks/African Americans more frequently reported having a usual source of sick care throughout the year, but slightly less frequently than AIANs and those of multiple races in the last two quarters of the year (Table 22).

Differences in Unmet Needs by Predisposing Factors and Interview Timing

While there were no differences in respondents' reports of unmet needs by nativity during the second, third, and fourth quarters of 2014, native-born adults during the first quarter and females during the first and second quarters of 2014 more frequently reported unmet needs because of cost (Table 23). Respondents who were married or partnered, white, or AIAN less frequently reported having needed medical care but decided to forgo care in 2014 as a result of cost (Table 23).

Differences in Delayed Care by Predisposing Factors and Interview Timing

While there were no differences by foreign birth or gender during the last quarter of 2014, native-born adults and females more frequently reported delaying care as a result of cost during 2014's first three quarters (Table 24). Married/partnered FBAs less frequently reported delaying care throughout 2014 (Table 24). Asians, Blacks/African Americans, and those of multiple races more frequently reported delaying care at steady rates throughout 2014 compared with AIANs and whites.

Table 20: Differences in ER Visits by Predisposing and Interview Timing in 2014

Predisposing Factors		Quarter 1				Quarter 2				Quarter 3				Quarter 4			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Age (years)	35–54	84	16	3	.115	85	15	10	.002 ^a	84	16	2	0.24	84	16	4	.056
	55–64	82	18			82	18			82	18			82	18		
Birth Origin	NB	83	18	15	<.001 ^a	82	18	19	<.001 ^a	82	18	13	<.001 ^a	82	18	6	.003 ^a
	FB	88	12			89	11			87	13			87	13		
Gender	Male	86	14	40	<.001 ^a	86	14	16	<.001 ^a	85	15	6	.017 ^a	84	16	.3	.557
	Female	82	18			81	19			82	18			83	17		
Marital Status	M/P	87	13	15	<.001 ^a	87	13	42	<.001 ^a	87	13	54	<.001 ^a	86	14	31	<.001 ^a
	Not M/P	80	20			79	21			78	22			80	20		
Race	White	85	15	40	<.001 ^a	84	16	29	<.001 ^a	84	16	46	<.001 ^a	84	16	34	<.001 ^a
	Black	77	23			76	24			76	24			76	25		
	Asian	69	31			80	20			71	29			74	26		
	AIAN	92	8			89	11			92	8			90	10		
	Multiple	78	22			80	20			73	27			86	14		

^a< 0.05, M/P = Married/Partnered, FB= foreign-born, NB = native-born, QTR = Quarter...defined by NHIS 2014 interview quarters1 to 4; original variable retained

Table 21: Differences in Doctor Visits by Predisposing and Interview Timing in 2014

Predisposing Factors		Quarter 1				Quarter 2				Quarter 3				Quarter 4			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Age	35–54	28	72	1.7	.197	28	72	1.5	.228	27	73	5.7	.017 ^a	28	72	0.7	.417
	55–64	30	70			30	70			30	70			30	70		
Nativity	NB	30	70	30	<.001 ^a	31	69	42	<.001 ^a	30	70	31	<.001 ^a	31	69	30	<.001 ^a
	FB	21	79			19	81			20	80			21	79		
Gender	Male	25	75	16	<.001 ^a	23	77	53	<.001 ^a	23	77	34	<.001 ^a	24	76	29	<.001 ^a
	Female	31	69			33	67			32	68			32	68		
Marital Status	M/P	29	71	1.4	.240	28	72	0.4	.522	29	71	1.1	.289	29	72	0.2	.669
	Not M/P	28	73			29	71			27	73			29	71		
Race	White	30	70	32	<.001 ^a	31	69	37	<.001 ^a	29	71	23	<.001 ^a	31	69	29	<.001 ^a
	Black	22	78			20	80			21	79			21	80		
	Asian	33	67			28	73			24	76			28	72		
	AIAN	18	82			21	80			25	75			21	79		
	Multiple	33	67			24	76			39	61			27	73		

^a< 0.05; E. Med = Eastern Mediterranean; M/P = Married/Partnered; AIAN: American Indian and Alaskan Natives; Data Source NHIS 2014 Native and Foreign-born; FB= foreign-born; NB = native-born; Quarter was defined by NHIS 2014 interview quarters1 to 4; original variable retained

Table 22: Differences in Usual Source of Care by Predisposing and Interview Timing

Predisposing Factors		Quarter 1				Quarter 2				Quarter 3				Quarter 4			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Age	35–54	13	87	26	<.001 ^a	12	88	21	<.001 ^a	11	89	12	.001 ^a	12	88	24	<.001 ^a
	55–64	8	92			8	92			8	92			7	93		
Nativity	NB	9	91	75	<.001 ^a	9	91	37	<.001 ^a	9	91	28	<.001 ^a	9	91	48	<.001 ^a
	FB	20	80			17	83			15	85			17	83		
Gender	Male	16	85	56	<.001 ^a	14	86	31	<.001 ^a	14	86	43	<.001 ^a	14	86	49	<.001 ^a
	Female	8	92			8	92			7	93			7	93		
Marital Status	M/P	10	91	16	<.001 ^a	9	92	22	<.001 ^a	9	92	12	.001 ^a	8	92	18	<.001 ^a
	Not M/P	14	86			13	87			12	88			13	87		
Race	White	12	88			11	89			10	90			11	90		
	Black	8	93			8	92			9	91			9	91		
	Asian	13	87	18	.001 ^a	10	90	6	.237	14	86	9	.063	10	90	2	.777
	AIAN	17	83			10	90			6	94			11	89		
	Multiple	16	84			15	85			17	83			9	92		

^a< 0.05; E. Med = Eastern Mediterranean; M/P = Married/Partnered; Data Source NHIS 2014 Native and Foreign-born; FB= foreign-born; NB = native-born; Quarter was defined by NHIS 2014 interview quarters1 to 4; original variable retained.

Table 23: Differences in Unmet Needs by Predisposing and Interview Timing in 2014

Predisposing Factors		Quarter 1				Quarter 2				Quarter 3				Quarter 4			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Age	35–54	90	10	2.7	.098	90	10	.87	.355	91	9	0.3	.591	91	9	1.0	.321
	55–64	89	11			91	9			90	10			90	10		
Nativity	NB	89	11	9.1	.003 ^a	90	10	2.4	.119	90	10	3.6	.059	91	9	0.2	.645
	FB	93	7			92	8			92	8			90	10		
Gender	Male	91	9	9.0	.003 ^a	92	8	9.6	.002 ^a	91	9	2.4	.121	92	8	4.6	.032
	Female	88	12			89	11			90	10			90	10		
Marital Status	M/P	94	6	95	<.001 ^a	95	5	101	<.001 ^a	95	6	82	<.001 ^a	94	6	57	<.001 ^a
	Not M/P	85	15			86	14			86	14			87	13		
Race	White	90	10	20	.001 ^a	91	9	14	.007 ^a	91	9	36	<.001 ^a	91	9	18	.002 ^a
	Black	88	12			88	12			89	12			86	14		
	Asian	85	15			90	10			83	17			90	10		
	AIAN	95	5			95	5			97	3			95	5		
	Multiple	78	22			83	17			74	26			86	14		

^a< 0.05; E. Med = Eastern Mediterranean; M/P = Married/Partnered; Data Source NHIS 2014 Native and Foreign-born; FB= foreign-born; NB = native-born; Quarter was defined by NHIS 2014 interview quarters1 to 4; original variable retained.

Table 24: Differences in Delayed Care by Predisposing and Interview Timing in 2014

Predisposing Factors		Quarter 1				Quarter 2				Quarter 3				Quarter 4			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Age	35–54	87	13	1.9	.171	87	13	1.9	.172	88	12	1.2	.264	88	12	2.0	.163
	55–64	85	15			88	12			87	13			87	13		
Nativity	NB	86	14	3.9	.047 ^a	87	13	6.1	.014 ^a	87	13	8.2	.004 ^a	88	12	.002	.963
	FB	88	12			90	10			91	9			88	12		
Gender	Male	88	12	8.1	.004 ^a	88	12	2.4	.122	89	11	4.5	.034 ^a	89	11	3.1	.081
	Female	85	15			87	13			87	13			87	13		
Marital Status	M/P	91	9	101	<.001 ^a	93	7	120	.001 ^a	92	8	69	<.001 ^a	92	8	66.1	<.001 ^a
	Not M/P	80	20			81	19			83	17			83	17		
Race	White	86	14	12	.018 ^a	87	13	16	.003 ^a	88	12	26	<.001 ^a	88	12	17.4	.002 ^a
	Black	86	14			88	12			87	13			86	14		
	Asian	82	18			88	13			79	21			85	15		
	AIAN	91	9			95	6			95	5			93	7		
	Multipl e	75	25			78	22			74	26			75	25		

^a< 0.05; E. Med = Eastern Mediterranean; M/P = Married/Partnered; Data Source NHIS 2014 Native and Foreign-born; Quarter was defined by NHIS 2014 interview quarters 1 to 4; original variable retained.

The results of differences in access indicators by enabling resources and interview timing in 2014 were presented in Tables 25 through 29, with further details below.

Differences in Emergency Room Visits by Enabling Resources and Interview Timing

As shown in Table 25, native-born and naturalized citizens as well as respondents who possessed insurance more frequently reported ER visit in 2014. While the difference in ER visits by U.S. region of residence was not significant during the second, third, and fourth quarters, respondents in the Northeast and Midwest reported more ER visits during the first quarter (Table 25). Similarly, those who were unemployed, less formally educated, and very poor reported more ER visits throughout 2014 (Table 25).

Differences in Doctor Visits by Enabling Resources and Interview Timing

As shown in Table 26, citizens, respondents with insurance, and those who did not speak English well more frequently reported doctor visits during 2014 (Table 26). Although there were no differences in doctor visits by U.S. region of residence during the first, third, and fourth quarters, respondents in the West and Midwest less frequently reported doctor visits during the second quarter of 2014. The poor (<200% of FPL) and those with less formal education more frequently reported doctor visits in 2014. Respondents who were employed more frequently reported doctor visits in the first and last quarters of 2014.

Differences in Usual Source of Care by Enabling Resources and Interview Timing

As shown in Table 28, citizens, respondents with insurance, those with high English language proficiency, and respondents who resided in the Northeast and Midwest more frequently reported having a usual source of care (Table 27). However, those with less formal education and low-income respondents less frequently reported having a usual source of care throughout 2014 (Table 27).

Differences in Unmet Needs by Enabling Resources and Interview Timing

The results of differences in enabling resources by unmet needs and interview timing in 2014 are shown in Table 28. Those who were uninsured, less formally educated, earned low-income, or unemployed more frequently reported having forgone health care throughout 2014, due to cost (Table 28). Although differences in report of unmet needs were not significant during the third quarter, respondents in the South more frequently reported having a health need but deciding to forgo care because of cost during the first, second, and fourth quarters of 2014 compared with respondents who lived in the Northeast, Midwest, or West (Table 28).

Differences in Delayed Care by Enabling Resources and Interview Timing

As shown in Table 29, more uninsured and poor respondents reported delaying care as a result of cost throughout 2014. There were no differences in reports of delayed care by U.S. region of residence during the first three quarters of 2014. However, respondents who resided in the South more frequently reported delaying care because of cost during the last quarter of 2014. Findings also revealed a steady decline in the frequency of participants' reports of delayed care because of cost among respondents in the Northeastern region throughout the year, from 14% during the first quarter to 9% by the fourth quarter (Table 29).

Table 25: Differences in ER Visits by Enabling and Interview Timing in 2014

Enabling Resources	Label	Quarter 1				Quarter 2				Quarter 3				Quarter 4			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Citizenship	No	90	11	10	.001 ^a	90	10	14	<.001 ^a	88	12	8	.004 ^a	89	11	8	.004 ^a
	Yes	83	17			83	17			83	18			83	17		
Insurance	No	87	13	5	.024 ^a	90	10	20	<.001 ^a	89	11	12	.001 ^a	89	11	11	.001 ^a
	Yes	83	17			82	18			82	18			83	18		
Language Proficiency	Very High	84	17	.7	.704	83	17	10	0.05 ^a	83	17	5	.085	83	17	3	.286
	High	84	17			87	13			85	15			87	13		
	Low	86	15			89	11			87	13			84	16		
U.S. Region	N/East	82	18	14	.003 ^a	84	16	4	.295	80	20	6	.118	81	19	7	.067
	Midwest	82	18			84	16			84	16			84	16		
	South	83	17			82	18			83	17			82	18		
	West	87	13			85	15			84	16			85	15		
Education	<HS	80	20	31	<.001 ^a	77	23	32	<.001 ^a	75	25	33	<.001 ^a	77	23	20	<.001 ^a
	HS/GED	79	21			80	20			81	19			82	18		
	College	86	14			86	14			85	15			85	15		
Employed	No	74	26	89	<.001 ^a	73	27	106	<.001 ^a	72	28	10	<.001 ^a	73	27	91	<.001 ^a
	Yes	87	13			87	13			87	13			87	14		
FPL	<100	70	30	112	<.001 ^a	70	30	123	<.001 ^a	68	32	142	<.001 ^a	71	29	123	<.001 ^a
	100- 200	80	20			77	23			80	20			76	24		
	>200	88	12			88	13			87	13			88	12		

^a ≤ 0.05; FPL = Federal Poverty Line; HS = High School; Data Source: NHIS 2014 (Native and Foreign-born)

Table 26: Differences in Doctor Visits by Enabling and Interview Timing in 2014

Enabling Resources	Label	Quarter 1				Quarter 2				Quarter 3				Quarter 4			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Citizenship	No	17	83	25	<.001 ^a	16	84	31	<.001 ^a	20	80	14	<.001 ^a	16	84	31	<.001 ^a
	Yes	30	70			30	70			29	71			30	70		
Insurance	No	25	76	6	.016 ^a	22	78	13	<.001 ^a	21	79	14	<.001 ^a	21	79	15	<.001 ^a
	Yes	29	71			30	71			29	71			30	70		
Language Proficiency	Very High	30	70	35	<.001 ^a	31	69	53	<.001 ^a	30	70	46	<.001 ^a	30	70	34	<.001 ^a
	High	19	81			16	84			20	80			20	80		
	Low	16	84			14	86			12	88			16	84		
U.S. Region	Northeast	27	73	3	.397	28	72	8	.040 ^a	29	71	4	.319	29	71	.5	.930
	Midwest	29	71			30	70			29	71			29	71		
	South	27	73			26	74			26	74			28	72		
	West	30	70			31	69			29	71			29	71		
Education	<HS	18	82	44	<.001 ^a	20	80	42	<.001 ^a	18	82	56	<.001 ^a	22	78	29	<.001 ^a
	HS/GED	25	75			25	75			23	78			25	75		
	College	32	68			32	68			32	68			32	68		
Employed	No	31	69	6	.019 ^a	30	70	2	.171	27	73	.1	.722	32	68	5	.024 ^a
	Yes	28	73			28	72			28	72			28	72		
FPL	<100	26	75	9	.009 ^a	24	76	8	.023 ^a	22	78	23	<.001 ^a	26	74	4	.132
	100 - 200	25	75			30	70			24	76			27	73		
	>200	30	70			29	71			30	70			30	70		

^a ≤ 0.05 ; FPL = Federal Poverty Line; HS = High School; *N/A included the native-born adults with whom years of residency was not applicable; Data Source: NHIS 2014 (Native and Foreign-born)

Table 27: Differences in Usual Source of Care by Enabling and Interview Timing

Enabling Resources	Label	Quarter 1				Quarter 2				Quarter 3				Quarter 4			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Citizenship	No	27	73	96	<.001 ^a	24	76	68	<.001 ^a	23	77	69	<.001 ^a	24	76	76	<.001 ^a
	Yes	10	90			9	91			21	79			9	91		
Insurance	No	36	64	477	<.001 ^a	37	63	410	<.001 ^a	36	64	419	<.001 ^a	41	59	501	<.001 ^a
	Yes	7	94			7	93			6	94			6	94		
Language Proficiency	Very High	10	90	79	<.001 ^a	10	90	37	<.001 ^a	9	91	48	<.001 ^a	9	91	53	<.001 ^a
	High	21	80			14	87			13	87			15	85		
	Low	25	75			22	78			22	78			23	77		
U.S. Region	N/East	8	92	35	<.001 ^a	5	95	31	<.001 ^a	6	94	18	<.001 ^a	7	93	16	.001 ^a
	Midwest	8	92			12	89			10	91			9	91		
	South	12	89			11	89			11	89			11	89		
	West	16	85			13	87			11	89			12	88		
Education	<HS	16	84	44	<.001 ^a	15	85	13	.002 ^a	16	85	33	<.001 ^a	16	84	45	<.001 ^a
	HS/GED	15	85			11	89			12	88			14	86		
	College	9	91			10	90			8	92			8	92		
Employed	No	12	88	.3	.616	8	92	13	<.001 ^a	9	91	2	.131	9	91	2	.153
	Yes	11	89			12	88			11	90			11	89		
FPL	<100	16	84	55	<.001 ^a	14	86	43	<.001 ^a	14	86	42	<.001 ^a	16	84	39	<.001 ^a
	100 - 200	17	83			16	84			15	85			14	86		
	>200	9	91			9	91			8	92			8	92		

^a ≤ 0.05 ; FPL = Federal Poverty Line; HS = High School; Data Source: NHIS 2014 (Native and Foreign-born)

Table 28: Differences in Unmet Needs by Enabling Resources and Interview Timing

Enabling Resources	Label	Quarter 1				Quarter 2				Quarter 3				Quarter 4			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Citizenship	No	91	9	.9	.355	91	9	.2	.640	90	10	.08	.773	88	12	2.1	.144
	Yes	90	11			90	10			91	10			91	9		
Insurance	No	70	30	319	<.001 ^a	71	29	241	<.001 ^a	71	29	241	<.001 ^a	73	27	177	<.001 ^a
	Yes	94	7			93	7			93	7			93	7		
Language Proficiency	Very High	90	10	.8	.677	91	10	.7	.702	90	10	.006	.997	91	10	2.8	.250
	High	88	12			91	9			90	10			91	9		
	Low	91	9			89	11			90	10			89	11		
U.S. Region	Northeast	92	8	10	.015 ^a	92	8	9	.035 ^a	92	8	4	.301	91	9	13	.006 ^a
	Midwest	90	10			92	8			90	10			91	9		
	South	88	12			89	11			90	10			88	13		
	West	90	10			90	10			90	10			90	10		
Education	<HS	86	14	20	<.001 ^a	87	13	13	.001 ^a	86	14	15	<.001 ^a	85	15	27	<.001 ^a
	HS/GED	88	12			89	11			91	9			89	11		
	College	91	9			92	8			91	9			92	8		
Employed	No	85	15	35	<.001 ^a	89	12	6	.016 ^a	85	15	47	<.001 ^a	86	14	27	<.001 ^a
	Yes	91	9			91	9			92	8			92	8		
FPL	<100	79	21	192	<.001 ^a	83	17	197	<.001 ^a	79	21	199	<.001 ^a	81	19	200	<.001 ^a
	100 - 200	81	19			80	21			83	17			80	20		
	>200	94	6			95	5			95	5			95	5		

^a ≤ 0.05; FPL = Federal Poverty Line; HS = High School; Data Source: NHIS 2014 (Native and Foreign-born);

*N/A included the native-born adults with whom years of residency was not applicable

Table 29: Differences in Delayed Care by Enabling Resources and Interview Timing

Variables	Label	Quarter 1				Quarter 2				Quarter 3				Quarter 4			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Citizenship	No	88	12	.8	.378	88	12	.04	.839	90	10	2	.150	88	12	.001	.971
	Yes	86	14			87	13			87	13			88	12		
Insurance	No	63	37	359	<.001 ^a	65	35	255	<.001 ^a	67	33	220	<.001 ^a	67	33	190	<.001 ^a
	Yes	91	9			90	10			91	9			91	10		
Language Proficiency	Very High	86	14	3	.248	87	13	4	.164	87	13	.82	.663	88	12	3	.231
	High	83	17			91	9			89	12			88	12		
	Low	86	15			88	12			89	11			86	14		
U.S. Region	Northeast	86	14	2	.350	89	12	2	.488	88	12	2	.547	91	9	13	.005 ^a
	Midwest	88	12			87	13			87	13			89	11		
	South	86	14			88	12			89	12			86	14		
	West	85	15			86	14			87	13			88	12		
Education	<HS	83	17	14	.001 ^a	86	14	.96	.618	85	15	3	.190	84	16	11	.003 ^a
	HS/GED	84	16			87	13			88	12			87	13		
	College	88	12			88	12			88	12			89	11		
Employment	No	82	18	21	<.001 ^a	87	13	.71	.398	83	17	30	<.001 ^a	84	16	13	<.001 ^a
	Yes	88	12			88	12			89	11			89	11		
FPL	<100	76	24	136	<.001 ^a	82	18	123	<.001 ^a	76	24	146	<.001 ^a	81	20	136	<.001 ^a
	100 - 200	78	22			77	23			81	19			77	23		
	>200	91	9			91	9			92	8			92	8		

^a ≤ 0.05; FPL = Federal Poverty Line; HS = High School; Data Source: NHIS 2014 (Native and Foreign-born)

Results of chi-square test for differences in access indicators by need factors and interview timing are presented in Tables 30 to 34.

Differences in Emergency Room Visits by Need Factors and Interview Timing

Respondents with poor health status, had functional limitations, and those with at least one chronic illness frequently reported emergency room visits throughout 2014 (Table 30).

Differences in Doctor Visits by Need Factors and Interview Timing

Respondents with poor health status and those who had functional limitations less frequently reported doctor visits in 2014 (Table 31). Although the differences were not statistically significant during the first two quarters of 2014, respondents with chronic illness less frequently reported doctor visits in the last two quarters of 2014 (Table 31).

Differences in Usual Source of Care by Need Factors and Interview Timing

Respondents with functional limitations, had poor health status, and those who had chronic illnesses more frequently reported having a usual source of sick care (Table 32).

Differences in Unmet Needs and Delayed Care by Need Factors and Interview Timing

Respondents with functional limitations, those with poor health status, and those who had chronic illness more frequently reported unmet needs (Table 33) and delaying care because of cost (Table 34).

Table 30: Differences in ER Visits by Need Factors and Interview Timing in 2014

Variables	Label	Quarter 1				Quarter 2				Quarter 3				Quarter 4			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Perception of Health	Excellent	92	8			91	9			93	7			92	9		
	Very Good	89	11	305	<.001 ^a	90	10	269	<.001 ^a	88	12	305	<.001 ^a	88	12	262	<.001 ^a
	Good	83	17			80	20			82	18			83	18		
	Fair/poor	62	38			64	36			61	39			62	38		
Functional Limitation	No	88	12	296	<.001 ^a	88	12	289	<.001 ^a	88	12	338	<.001 ^a	88	12	335	<.001 ^a
	Yes	62	38			62	38			59	41			59	41		
Chronic Illness	No	91	9	95	<.001 ^a	90	10	96	<.001 ^a	92	8	145	<.001 ^a	90	10	36	<.001 ^a
	Yes	79	21			78	22			77	23			79	21		

^a<0.05; ^bperception of health include self-rated perception of health status; ^cChronic illness: defined as presence of at least one of the following: hypertension, stroke, heart disease, asthma, COPD, cholesterol problems, and diabetes mellitus.

Table 31: Differences in Doctor Visits by Need Factors and Interview Timing

Variables	Label	Quarter 1				Quarter 2				Quarter 3				Quarter 4			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Perception of Health	Excellent	27	73			28	72			26	74			25	75		
	Very Good	31	69	8.5	.036 ^a	28	72	5.3	.15	29	71	14.7	.002 ^a	29	71	19.6	<.001 ^a
	Good	26	74			27	73			25	75			28	72		
	Fair/poor	31	69			32	68			33	67			36	64		
Functional Limitation	No	27	73	22.5	<.001 ^a	27	73	30.1	<.001 ^a	27	73	13.8	<.001 ^a	27	73	29.7	<.001 ^a
	Yes	36	64			37	63			34	66			38	63		
Chronic Illness	No	28	72	.32	.569	28	72	0.7	.39	25	75	11.5	<.001 ^a	27	73	3.6	.060
	Yes	29	71			29	71			30	70			30	70		

^a<0.05; ^bperception of health include self-rated perception of health status; ^cChronic illness: defined as presence of at least one of the following: hypertension, stroke, heart disease, asthma, COPD, cholesterol problems, and diabetes mellitus.

Table 32: Differences in Usual Source of Care by Need and Interview Timing

Variables	Label	Quarter 1				Quarter 2				Quarter 3				Quarter 4			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Perception of Health	Excellent	14	86			13	87			10	90			11	89		
	Very Good	10	90	32	<.001 ^a	11	89	14	.003 ^a	11	89	5	.20	10	90	4	.33
	Good	13	87			11	89			10	90			11	89		
	Fair/poor	6	94			7	93			8	92			9	91		
Functional Limitation	No	13	87	31	<.001 ^a	12	88	34	<.001 ^a	11	89	7	.009 ^a	11	89	16	<.001 ^a
	Yes	5	95			5	95			7	93			6	94		
Chronic Illness	No	17	83	95	<.001 ^a	17	83	114	<.001 ^a	15	85	71	<.001 ^a	15	85	57	<.001 ^a
	Yes	7	93			6	94			7	93			7	93		

^a<0.05; ^bperception of health include self-rated perception of health status; ^cChronic illness: defined as presence of at least one of the following: hypertension, stroke, heart disease, asthma, COPD, cholesterol problems, and diabetes mellitus.

Table 33: Differences in Unmet Needs by Need Factors and Interview Timing

Variables	Label	Quarter 1				Quarter 2				Quarter 3				Quarter 4			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Perception of Health	Excellent	97	4			97	4			97	3			97	3		
	Very Good	94	6			94	6	14	<.001 ^a	94	6			93	7	16	<.001 ^a
	Good	88	12	239	<.001 ^a	87	13	8		89	11	188	<.001 ^a	89	12	0	
	Fair/poor	74	26			80	20			77	23			78	22		
Functional Limitation	No	93	7			93	8			93	7			93	7	12	<.001 ^a
	Yes	75	25	197	<.001 ^a	81	19	92	<.001 ^a	77	23	161	<.001 ^a	79	21	1	
Chronic Illness	No	93	7			93	8			93	7			94	6		
	Yes	88	12	30	<.001 ^a	89	11	14	<.001 ^a	89	11	23	<.001 ^a	88	12	34	<.001 ^a

^a<0.05; ^bperception of health include self-rated perception of health status; ^cChronic illness: defined as presence of at least one of the following: hypertension, stroke, heart disease, asthma, COPD, cholesterol problems, and diabetes mellitus.

Table 34: Differences in Delayed Care by Need Factors and Interview Timing

Variables	Label	Quarter 1				Quarter 2				Quarter 3				Quarter 4			
		No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P	No (%)	Yes (%)	χ^2	P
Perception of Health	Excellent	93	7			94	6			96	5			95	5		
	Very Good	90	10	146	<.001 ^a	90	11	110	<.001 ^a	90	10	173	<.001 ^a	90	10	150	<.001 ^a
	Good	82	18			84	16			86	14			86	14		
	Fair/poor	74	26			78	22			74	26			75	25		
Functional Limitation	No	89	11	129	<.001 ^a	90	10	68	<.001 ^a	91	9	145	<.001 ^a	91	9	118	<.001 ^a
	Yes	73	27			86	14			74	26			75	25		
Chronic Illness	No	90	10	33	<.001 ^a	90	10	12	.001 ^a	91	9	22	<.001 ^a	91	9	25	<.001 ^a
	Yes	84	17			78	22			86	14			86	14		

^a<0.05; ^bperception of health include self-rated perception of health status; ^cChronic illness: defined as presence of at least one of the following: hypertension, stroke, heart disease, asthma, COPD, cholesterol problems, and diabetes mellitus.

Predictors of Health Care Access Among Foreign-born Adults

Logistic regression modeling was used to examine predictors of health care access, based on Andersen's model (predisposing, enabling, and need factors), among FBAs in the United States. Multivariate results examining the relationship between access outcomes and predisposing factors are presented in Tables 35 through 39.

Influence of Access Predictors on ER Visits Among Foreign-born Persons

Foreign-born adult males were 35% less likely to report having had at least one ER visit ($p = 0.007$) in 2013 and 2015, compared with FBA females (Table 35). Likewise, FBAs who were married or partnered were about 40% less likely to report an ER visit compared with their unmarried or non-partnered counterparts (Table 35).

Influence of Access Predictors on Doctor Visits Among Foreign-born Persons

As detailed in Table 36, compared with near-elderly FBAs (i.e., age range between 55 and 64), middle-aged FBAs (age group 35 to 54) were 52% less likely to have reported doctor visit in 2013, 49% less likely in 2014, and about 50% less likely in 2015 ($p < 0.001$). Likewise, compared with females, males were about 40% less likely to report doctor visits across the three years examined ($p < 0.001$).

Compared with those who identified as White, Black/African American respondents were more likely to report doctor visits in 2015 ($p = 0.045$), while those who identified as Asian, AIAN, or of multiple races were about 50% less likely to report at least one visit to a health care provider in 2013 only ($p = 0.013$) (Table 36). Foreign-born adults from Europe were almost twice as likely to report doctor visit in 2013 (OR = 1.422, $p = 0.043$), 2014 (OR = 1.692, $p = 0.005$), and 2015 (OR = 1.638, $p = 0.033$) compared with FBAs from the Americas. Individuals

from Southeast Asia were more than twice as likely to report doctor visits in 2013 (OR = 2.113, $p = 0.004$) and 2015 (OR = 2.389, $p = 0.002$) compared with FBAs from the Americas.

Influence of Access Predictors on Usual Source of Care Among FBAs

Compared with older adults, middle-aged adults were about 60% less likely to report having a usual source of sick care in 2013 (OR = 0.416, $p < 0.001$), 2014 (OR = 0.554, $p < 0.001$), and 2015 (OR = 0.414, $p < 0.001$) (Table 37). Males were about 70% less likely to report having a usual source of sick care in 2013 (OR = 0.382, $p < 0.001$), 2014 (OR = 0.314, $p < 0.001$), and 2015 (OR = 0.381, $p < 0.001$).

Compared with FBAs who identified as whites, those who identified as blacks were more than twice as likely to report having a usual source of sick care in 2013 (OR = 2.296, $p < 0.001$) and 2015 (OR = 2.392, $p < 0.001$). Moreover, FBAs from Europe were roughly twice as likely to report having a usual source of care in 2013 (OR = 1.830, $p = 0.028$), 2014 (OR = 2.539, $p < 0.001$), and 2015 (OR = 1.878, $p = 0.022$) compared with respondents from the Americas.

Influence of Access Predictors on Unmet Needs and Delayed Care Among FBAs

Compared with their unmarried or non-partnered counterparts, married or partnered FBAs were about 50% less likely in 2013 (OR = 0.466, $p < 0.001$), 2014 (OR = 0.565, $p = 0.004$), and 2015 (OR = 0.465, $p < 0.001$) to report unmet needs because of costs (Table 38). As shown in Table 39, married or partnered FBAs were about 50% less likely in 2013 (OR = 0.434, $p < 0.001$), 2014 (OR = 0.475, $p < 0.001$), and 2015 (OR = 0.436, $p < 0.001$) to report delaying care because of costs.

Table 35: Influence of Predisposing on ER Visits Among Foreign-born Adults

Predisposing Factors	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
Age (years)	35–54	0.780 (.545-1.115)	.173	1.042 (.708-1.534)	.835	0.744 (.539-1.113)	.167
	55–64 (Ref.)						
Gender	Male	0.649 (.475-.888)	.007 ^a	0.821 (.605-1.114)	.205	0.652 (.477-.891)	.007 ^a
	Female (Ref.)						
Marital Status	M/P	1.125 (.811-1.567)	.464	0.616 (.450-.843)	.002 ^a	1.126 (.810-1.566)	.472
	Not M/P (Ref.)						
Race	Black	1.340 (.824-2.179)	.238	1.335 (.819-2.175)	.246	1.431 (.898-2.280)	.132
	Asian [†]	0.873 (.505-1.509)	.627	0.831 (.375-1.842)	.649	0.698 (.394-1.238)	.219
	White (Ref.)						
Region of Origin	Europe	0.832 (.480-1.440)	.511	0.975 (.570-1.669)	.926	0.834 (.481-1.446)	.517
	Africa/E. Med	1.081(.585-1.996)	.804	1.197 (.639-2.243)	.575	0.905 (.537-1.526)	.708
	SE Asia	0.694 (.392-1.227)	.209	0.967 (.430-2.171)	.935	0.872 (.396-1.918)	.733
	Americas (Ref.)						

[†]American Indian and Alaska Natives and multiple races; ^ap <0.05; Ref. = Reference Category; OR = Odds Ratio.

M/P= Married/Partnered; E.Med.= Eastern Mediterranean

Table 36: Influence of Predisposing on Doctor Visits Among Foreign-born Adults

Predisposing Factors	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
Age	35-54	0.483 (.357-.654)	<.001 ^a	0.592 (.455-.771)	<.001 ^a	0.498 (.368-.676)	<.001 ^a
	55– 64 (Ref.)						
Gender	Male	0.616 (.464-.817)	<.001 ^a	0.645 (.523-.795)	<.001 ^a	0.616 (.463-.818)	.001 ^a
	Female (Ref.)						
Marital Status	M/P	0.985 (.731-1.329)	.923	1.117 (.893-1.398)	.333	1.002 (.743-1.353)	.967
	Not M/P (Ref.)						
Race	Black	1.442 (.923-2.252)	.108	1.309 (.912-1.879)	.145	1.555 (1.010-2.393)	.045 ^a
	Asian [‡]	0.523 (.314-.870)	.013 ^a	0.895 (.576-1.390)	.621	0.858 (.547-1.345)	.505
	White (Ref.)						
Region of Origin	Europe	1.597 1.015-2.514)	.043a	1.692 (1.170-2.448)	.005 ^a	1.638 (1.040-2.579)	.033 ^a
	Africa/E. Med	1.388 (.817-2.358)	.225	1.161 (.716-1.884)	.544	1.253 (.819-1.919)	.299
	SE Asia	2.113 (1.269-3.520)	.004 ^a	1.461 (.931-2.294)	.099	2.389 (1.383-4.126)	.002 ^a
	Americas (Ref.)						

[‡]American Indian and Alaska Natives and multiple races; ^ap <0.05; Ref. = Reference Category; OR = Odds Ratio.
M/P= Married/Partnered; E.Med.= Eastern Mediterranean

Table 37: Influence of Predisposing on Usual Source of Care Among FBAs

Predisposing Factors	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
Age	35-54	0.416 (.280-.617)	<.001 ^a	0.554 (.404-.760)	<.001 ^a	0.414 (.279-.614)	<.001 ^a
	55- 64 (Ref.)						
Gender	Male	0.382 (.287-.507)	<.001 ^a	0.314 (.238-.415)	<.001 ^a	0.381 (.287-.507)	<.001 ^a
	Female (Ref.)						
Marital Status	M/P	1.725 (1.300-2.290)	<.001 ^a	1.713 (1.311-2.237)	<.001 ^a	1.725 (1.300-2.289)	<.001 ^a
	Not M/P (Ref.)						
Race	Black	2.296 (1.452-3.632)	<.001 ^a	1.326 (.859-2.046)	.203	2.392 (1.512-3.783)	<.001 ^a
	Asian [†]	0.980 (.593-1.618)	.936	0.877 (.553-1.390)	.575	1.520 (.897-2.576)	.119
	White (Ref.)						
Region of Origin	Europe	1.830 (1.069-3.135)	.028 ^a	2.539 (.1.523-4.233)	<.001 ^a	1.878 (1.094-3.222)	.022 ^a
	Africa/E. Med	1.147 (.639-2.058)	.645	1.593 (.878-2.891)	.125	1.117 (.674-1.854)	.667
	SE Asia	1.836 (1.093-3.086)	.022 ^a	3.197 (1.950-5.242)	<.001 ^a	2.413 (1.058-5.506)	.036 ^a
	Americas (Ref.)						

[†]American Indian and Alaska Natives and multiple races; ^ap <0.05; Ref. = Reference Category; OR = Odds Ratio.

M/P= Married/Partnered; E.Med.= Eastern Mediterranean

Table 38: Influence of Predisposing on Unmet Needs Among Foreign-born Adults

Predisposing Factors	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
Age	35-54	1.186 (.741-1.898)	.478	1.031 (.658-1.616)	.894	1.180 (.728-1.913)	.502
	55- 64 (Ref.)						
Gender	Male	1.109 (.740-1.663)	.616	1.089 (.757-1.568)	.646	0.914 (.610-1.370)	.626
	Female (Ref.)						
Marital Status	M/P	0.466 (.304-.714)	<.001 ^a	0.565 (.383-.832)	.004 ^a	0.465 (.738-1.656)	<.001 ^a
	Not M/P (Ref.)						
Race	Black	1.031 (.623-1.706)	.905	1.332 (.768-2.311)	.307	0.956 (.550-1.661)	.872
	Asian [†]	0.466 (.156-1.390)	.171	0.852 (.191-1.772)	.341	0.448 (.180-1.112)	.083
	White (Ref.)						
Region of Origin	Europe	1.026 (.528-1.997)	.939	0.769 (.415-1.425)	.404	1.017 (.523-1.976)	.961
	Africa/E. Med	0.996 (.492-2.017)	.992	0.829 (.379-1.810)	.637	1.176 (.530-2.605)	.690
	SE Asia	1.135 (.399-3.230)	.812	0.701 (.237-2.073)	.521	0.917 (.322-2.607)	.870
	Americas (Ref.)						

[†]American Indian and Alaska Natives and multiple races; ^ap <0.05; Ref. = Reference Category; OR = Odds Ratio.
M/P= Married/Partnered; E.Med.= Eastern Mediterranean

Table 39: Influence of Predisposing on Delayed Care Among Foreign-born Adults

Predisposing Factors	Label	2013	P	2014	P	2015	P
		OR (95% CI)		OR (95% CI)		OR (95% CI)	
Age	35-54	0.937 (.614-1.429)	.762	0.914(.620-1.346)	.647	0.947 (.621-1.444)	.799
	55– 64 (Ref.)						
Gender	Male	1.101 (.763-1.588)	.607	1.026 (.745-1.414)	.874	1.100 (.763-1.586)	.609
	Female (Ref.)						
Marital Status	M/P	0.434 (.297-.634)	<.001 ^a	0.475 (.341-.661)	<.001 ^a	0.436 (.297-.640)	<.001 ^a
	Not M/P (Ref.)						
Race	Black	0.779 (.475-1.276)	.320	1.329 (.813-2.175)	.257	0.762 (.459-1.264)	.293
	Asian [‡]	0.647 (.266-1.574)		0.557 (.230-1.350)		0.769 (.381-1.552)	
	White (Ref.)						
Region of Origin	Europe	1.292 (.740-2.257)	.368	0.852 (.504-1.443)	.552	1.297 (.744-2.260)	.359
	Africa/E. Med	0.722 (.357-1.462)		0.666 (.311-1.429)		0.789 (.405-1.539)	
	SE Asia	0.966 (.401-2.329)		0.932 (.395-2.195)		0.911 (.375-2.212)	
	Americas (Ref.)						

[‡]American Indian and Alaska Natives and multiple races; ^ap <0.05; Ref. = Reference Category; OR = Odds Ratio.

M/P= Married/Partnered; E.Med.= Eastern Mediterranean

The summary of findings from multivariate analyses to examine the relationship between access outcomes and enabling resources are presented in Tables 40 to 44.

Influence of Access Predictors on Emergency Room Visits Among FBAs

Uninsured FBAs were about 60% less likely to report at least one emergency room (ER) visit ($p = 0.007$) from 2013 to 2015, compared with those who had insurance (Table 40). In 2014, FBAs in the <200% FPL group were more than twice as likely to report an ER visit (OR = 2.199, $p = 0.001$), compared with those who were in the >200% FPL group (Table 40).

FBAs who rated their health status as good or excellent were about 50% less likely to report an ER visit in 2014 (OR = 0.514, $p = 0.017$) and 2015 (OR = 0.365, $p < 0.001$), compared with those with a poorer perception of health (Table 45). FBAs without functional limitations were about 80% less likely (OR = 0.192, $p < 0.001$) in 2013 and 2014 (OR = 0.240, $p < 0.001$) to report an ER visits compared with those who with functional limitation (Table 45). Moreover, FBAs without a chronic illness were about 50% less likely to visit the ER (OR = 0.458, $p = 0.001$) in 2013, about 30% less likely in 2014 (OR = 0.663, $p = 0.014$), and 2015 (OR = 0.694, $p = 0.025$), compared with those who lived with at least one chronic illness (Table 45).

Influence of Access Predictors on Doctor Visits Among FBAs

Uninsured FBAs were about 70% less likely to report having a doctor visit ($p = <0.001$) from 2013 to 2015 compared with FBAs with insurance (Table 41). Similarly, those who were in the 100 – 200% FPL group were about 40% less likely to report doctor visits in 2013 (OR = 0.633, $p = 0.037$) and 2015 (OR = 0.656, $p = 0.032$), compared with those in the >200% of the FPL group (Table 41).

As shown in Table 46, FBAs in excellent health were about 50% less likely to report doctor visits (OR = 0.459, $p = 0.004$) in 2015, compared with those with poor health status (Table 46). Likewise, FBAs without functional limitations were about 80% less likely (OR = 0.190, $p < 0.001$) to report doctor visits in 2015, compared with FBAs who reported functional limitations (Table 46). Moreover, compared with FBAs with at least one chronic illness, those without were about 60% less likely in 2013 (OR = 0.428, $p < 0.001$) and 2014 (OR = 0.375, $p = < 0.001$), and about 40% less likely in 2015 (OR = 0.603, $p = 0.001$) to report doctor visits (Table 46).

Influence of Access Predictors on Usual Source of Care Among FBAs

As shown in Table 42, compared with those who had lived in the U.S. for >15 years, newly arrived FBAs with fewer than 5 years residency in the U.S. were about 60% less likely to have a usual source of sick care in 2013 ($p = 0.012$), 2014 ($p = 0.014$), and 2015 ($p = 0.012$). Noncitizen FBAs were about 40% less likely to report having a usual source of sick care (OR = 0.669, $p = 0.019$) in 2013, compared with their counterparts who were citizens (Table 43). Moreover, uninsured FBAs were about 90% less likely to have a usual source of sick care compared with their counterparts who possessed insurance in 2013 ($p < 0.001$) (Table 42).

Interestingly, FBAs in the Northeast region of the U.S. were twice as likely to have a usual source of sick care in 2013 (OR = 2.746, $p = < 0.001$) and in 2015 (OR = 2.783, $p = < 0.001$), while those who resided in the Midwest were about 70% more likely to have a usual source of sick care (OR = 1.692, $p = < 0.001$) compared with respondents who resided in the South (Table 42).

Compared with FBAs who rated their health status as fair or poor, those with better health status were three times more likely to report a usual source of sick care (OR = 3.119, $p < 0.001$) in 2013 and were about twice as likely in 2015 (OR = 1.795, $p = 0.021$) (Table 47). In 2014, FBAs without functional limitations were about 60% less likely (OR = 0.444, $p = 0.023$) to report having a usual source of sick care compared with those who had at least one functional limitation (Table 47). Similarly, FBAs without chronic illness were about 60% less likely to report having a usual source of sick care in 2013 (OR = 0.364, $p < 0.001$), 2014 (OR = 0.364, $p < 0.001$), and 2015 (OR = 0.447, $p < 0.001$), compared with those who lived with at least one chronic illness (Table 47).

Influence of Access Predictors on Unmet Needs Among Foreign-born Adults

As shown in Table 43, compared with FBAs with insurance, uninsured FBAs were about four times as likely to report unmet needs because of cost across all three years ($p < 0.001$). Likewise, poor FBAs were about twice as likely to report unmet needs because of cost (OR = 2.107, $p = 0.008$) in 2014 compared with their wealthier counterparts (Table 43). FBAs with high school diploma or GED were about 50% less likely to report delayed care because of cost in 2013 and 2015, compared with FBAs with college degree (Table 44). However, poorer FBAs (<100% FPL) were twice as likely to report unmet needs because of cost in 2013 (OR = 1.722, $p = 0.035$), 2014 (OR = 1.683, $p = 0.026$), and 2015 (OR = 1.754, $p = 0.033$), compared with their wealthier counterparts (Table 44).

Foreign-born adults with excellent health status were about 80% less likely to report unmet needs because of cost in 2013 (OR = 0.165, $p < 0.001$), 2014 (OR = 0.174, $p < 0.001$), and 2015 (OR = 0.249, $p < 0.001$), compared with those with a fair or poor health status (Table 48).

Likewise, FBAs without functional limitations were about 60% less likely to report unmet needs because of cost in 2015, compared with FBAs with at least one functional limitation (Table 48). Foreign-born adults without a chronic illness were about 60% less likely in 2013 to report unmet needs because of cost (OR = 0.357, $p = 0.015$) (Table 48).

Influence of Access Predictors on Delayed Care Among Foreign-born Adults

As shown in Table 49, FBAs with excellent health status were 90% less likely to report delayed care across all three years ($p < 0.001$), compared with FBAs with poor health status. Compared with those with a functional limitation, FBAs without functional limitations were about 60% less likely to report delayed care because of cost in 2015 (Table 49). In 2013, FBAs with no chronic illnesses were about 70% less likely to report delayed care because of cost compared with those who had at least one chronic illness (Table 49).

Table 40: Influence of Enabling on ER Visits Among Foreign-born Adults

Enabling Resources	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
U.S Residency (Yrs.)	≤5	0.600 (.286-1.259)	.177	1.398 (.664-2.944)	.377	1.719 (.824-3.584)	.149
	5 – ≤15	1.027 (.697-1.514)	.892	0.860 (.563-1.313)	.484	0.983 (.666-1.452)	.932
	> 15 (Ref.)						
Citizenship Status	No	0.093 (.645-1.343)	.772	0.851 (.595-1.217)	.377	0.960 (.657-1.401)	.832
	Yes (Ref)						
Insurance	No	0.405 (.250-.658)	<.001 ^a	0.451 (.302-.673)	<.001 ^a	0.409 (.252-.665)	<.001 ^a
	Yes (Ref)						
Language Proficiency	Very High	1.041 (.622-1.744)	.878	1.186 (.755-1.863)	.459	0.878 (.530-1.454)	.612
	High	1.253 (.769-2.043)	.365	1.057 (.677-1.653)	.806	0.767 (.472-1.247)	.285
	Low (Ref)						
U.S. Region/ Location	Northeast	1.494 (.994-2.247)	.054	1.171 (.759-1.807)	.475	1.503 (.999-2.261)	.051
	Midwest	0.843 (.484-1.471)	.548	1.310 (.773-2.221)	.316	0.855 (.490-1.492)	.582
	West	0.699 (.472-1.034)	.073	0.801 (.555-1.158)	.239	0.707 (.478-1.048)	.084
	South (Ref.)						
Education	<HS	1.053 (.635-1.746)	.842	1.439 (.920-2.250)	.111	1.073 (.637-1.807)	.791
	HS/GED	1.399 (.903-2.168)	.133	1.461 (.955-2.236)	.080	1.426 (.918-2.214)	.114
	College (Ref.)						
FPL (%)	<100	1.366 (.834-2.237)	.215	2.199 (1.391-3.474)	.001 ^a	1.404 (.853-2.309)	.182
	100 - 200	1.246 (.833-1.864)	.284	1.509 (1.004-2.269)	.048 ^a	1.290 (.860-1.937)	.219
	>200 (Ref)						

Note: ^ap <0.05; Ref. = Reference Category; OR = Odds Ratio; HS = High School

Table 41: Influence of Enabling on Doctor Visits Among Foreign-born Adults

Enabling Resources	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
U.S Residency (Yrs.)	≤5	1.557 (.695-3.492)	.282	0.628 (.373-1.056)	.080	0.642 (.286-1.440)	.282
	5 – ≤15	0.750 (.533-1.056)	.099	0.865 (.656-1.139)	.301	1.333 (.947-1.876)	.099
	> 15 (Ref.)						
Citizenship Status	No	0.882 (.588-1.151)	.253	0.843 (.655-1.085)	.184	0.771 (.544-1.092)	.143
	Yes (Ref)						
Insurance	No	0.326 (.192-.552)	<.001 ^a	0.321 (.249-.413)	<.001 ^a	0.323 (.189-.551)	<.001 ^a
	Yes (Ref)						
Language Proficiency	Very High	1.092 (.705-1.689)	.694	1.225 (.887-1.692)	.218	0.916 (.592-1.418)	.694
	High	1.109 (.719-1.712)	.639	1.152 (.858-1.545)	.346	0.901 (.584-1.391)	.639
	Low (Ref)						
U.S. Region/ Location	Northeast	1.312 (.901-1.911)	.156	0.896 (.654-1.227)	.493	1.313 (.901-1.913)	.156
	Midwest	1.086 (.691-1.706)	.721	1.201 (.813-1.775)	.357	1.084 (.689-1.706)	.726
	West	0.816 (.580-1.150)	.246	0.790 (.619-1.009)	.059	0.830 (.589-1.168)	.285
	South (Ref.)						
Education	<HS	1.289 (.806-2.063)	.289	0.943 (.691-1.286)	.711	0.775 (.485-1.241)	.289
	HS/GED	1.075 (.717-1.610)	.727	1.007 (.740-1.370)	.965	0.931 (.621-1.394)	.727
	College (Ref.)						
FPL (%)	<100	0.880 (.571-1.357)	.563	0.884 (.634-1.231)	.465	0.871 (.564-1.346)	.534
	100 - 200	0.633 (.451-.976)	.037 ^a	0.936 (.708-1.238)	.644	0.656 (.446-.965)	.032 ^a
	>200 (Ref)						

Note: ^ap <0.05; Ref. = Reference Category; OR = Odds Ratio

Table 42: Influence of Enabling on Usual Source of Care Among FBAs

Enabling Resources	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
U.S Residency (Yrs.)	≤5	0.437 (.228-.836)	.012 ^a	0.447 (.235-.849)	.014 ^a	0.437 (.228-.836)	.012 ^a
	5 – ≤15	0.784 (.553-1.110)	.170	0.776 (.561-1.073)	.125	1.276 (.553-1.110)	.170
	> 15 (Ref.)						
Citizenship Status	No	0.669 (.479-.935)	.019 ^a	0.830 (.601-1.147)	.260	0.711 (.503-1.005)	.053
	Yes (Ref)						
Insurance	No	0.123 .089-.170)	<.001 ^a	0.135 (.100-.183)	<.001 ^a	0.125 (.090-.172)	<.001 ^a
	Yes (Ref)						
Language Proficiency	Very High	0.964 (.615-1.510)	.871	1.107 (.728-1.685)	.633	0.964 (.615-1.510)	.871
	High	0.834 (.559-1.244)	.373	0.885 (.619-1.266)	.504	0.834 (.559-1.244)	.373
	Low (Ref)						
U.S. Region/ Location	Northeast	2.746 (1.747-4.316)	<.001 ^a	1.295 (.845-1.984)	.235	2.783 (1.778-4.355)	<.001 ^a
	Midwest	1.671 (.998-2.797)	.051	1.607 (.959-2.693)	.071	1.692 (1.010-2.832)	.046 ^a
	West	1.181 (.854-1.632)	.314	0.884 (.649-1.205)	.436	1.172 (.844-1.628)	.343
	South (Ref.)						
Education	<HS	0.782 (.502-1.219)	.277	0.980 (.636-1.510)	.927	0.782 (.502-1.219)	.277
	HS/GED	1.043 9.696-1.564)	.837	0.775 (.526-1.141)	.196	1.043 (.696-1.564)	.837
	College (Ref.)						
FPL (%)	<100	1.154 (.744-1.790)	.523	0.820 (.553-1.218)	.326	1.154 (.744-1.790)	.523
	100 - 200	0.802 (.552-1.166)	.247	0.766 (.536-1.096)	.145	0.802 (.552-1.166)	.247
	>200 (Ref)						

Note: ^ap <0.05; Ref. = Reference Category; HS = high school; OR = Odds Ratio; FPL = Federal Poverty Line

Table 43: Influence of Enabling Resources on Unmet Needs Among FBAs

Enabling Resources	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
U.S Residency (Yrs.)	≤5	0.857 (.308-2.382)	.767	0.595 (.646-4.372)	.288	1.167 (.420-3.244)	.767
	5 – ≤15	1.069 (.674-1.695)	.776	0.876 (.705-1.847)	.590	0.935 (.590-1.483)	.776
	> 15 (Ref.)						
Citizenship Status	No	0.984 (.550-1.763)	.984	0.966 (.646-1.660)	.885	1.016 (.567-1.820)	.958
	Yes (Ref)						
Insurance	No	4.559 (2.742-7.579)	<.001 ^a	3.200 (2.008-5.100)	<.001 ^a	4.589 (2.765-7.616)	<.001 ^a
	Yes (Ref)						
Language Proficiency	Very High	0.960 (.459-2.010)	.914	1.218 (.660-2.246)	.528	1.041 (.498-2.179)	.914
	High	1.035 (.548-1.956)	.915	1.058 (.613-1.825)	.840	0.966 (.511-1.825)	.915
	Low (Ref)						
U.S. Region/ Location	Northeast	0.889 (.493-1.603)	.695	0.987 (.546-1.784)	.965	0.892 (.496-1.604)	.702
	Midwest	1.415 (.749-2.671)	.285	1.197 (.625-2.291)	.588	1.418 (.752-2.673)	.280
	West	1.038 (.646-1.669)	.877	0.828 (.529-1.296)	.409	1.037 (.643-1.673)	.882
	South (Ref.)						
Education	<HS	1.297 (.680-2.474)	.429	0.814 (.486-1.361)	.431	0.771 (.404-1.470)	.429
	HS/GED	1.691 (.896-3.190)	.105	1.178 (.689-2.014)	.549	0.591 (.313-1.116)	.105
	College (Ref.)						
FPL (%)	<100	1.793 (.990-3.055)	.054	1.958 (1.080-3.549)	.027 ^a	1.753 (.984-3.123)	.057
	100 - 200	1.609 (.940-2.753)	.083	2.107 (1.211-3.668)	.008 ^a	1.634 (.927-2.880)	.089
	>200 (Ref)						

Note: ^ap <0.05; Ref. = Reference Category; OR = Odds Ratio

Table 44: Influence of Enabling Resources on Delayed Care Among FBAs

Enabling Resources	Label	2013	P	2014	P	2015	P
		OR (95% CI)		OR (95% CI)		OR (95% CI)	
U.S Residency (Yrs.)	≤5	1.363 (.562-3.306)	.493	0.688 (.311-1.526)	.358	1.363 (.562-3.306)	.493
	5 – ≤15	1.072 (.698-1.647)	.751	0.774 (.501-1.196)	.249	1.072 (.698-1.647)	.751
	> 15 (Ref.)						
Citizenship Status	No	0.865 (.527-1.419)	.565	0.793 (.532-1.181)	.254	0.865 (.527-1.419)	.565
	Yes (Ref)						
Insurance	No	3.840 (2.498-5.903)	<.001 ^a	4.108 (2.781-6.066)	<.001 ^a	3.891 (2.532-5.979)	<.001 ^a
	Yes (Ref)						
Language Proficiency	Very High	1.129 (.615-2.073)	.696	1.065 (.644-1.760)	.806	1.129 (.615-2.073)	.696
	High	1.322 (.758-2.305)	.325	0.931 (.592-1.463)	.756	1.322 (.758-2.305)	.325
	Low (Ref)						
U.S. Region/ Location	Northeast	0.962 (.577-1.603)	.882	1.484 (.921-2.391)	.105	0.969 (.583-1.611)	.905
	Midwest	1.510 (.856-2.662)	.155	1.083 (.591-1.983)	.797	1.517 (.859-2.677)	.151
	West	0.799 (.513-1.246)	.322	0.894 (.604-1.323)	.575	0.802 (.513-1.253)	.332
	South (Ref.)						
Education	<HS	0.587 (.332-1.037)	.067	0.703 (.454-1.089)	.115	0.589 (.330-1.048)	.072
	HS/GED	0.538 (.302-.959)	.036 ^a	0.983 (.624-1.549)	.942	0.544 (.303-.975)	.041 ^a
	College (Ref.)						
FPL (%)	<100	1.722 (1.040-2.851)	.035 ^a	1.581 (.976-2.561)	.063	1.754 (1.047-2.939)	.033 ^a
	100 - 200	1.643 (.986-2.737)	.057	1.683 (1.065-2.658)	.026 ^a	1.691 (.993-2.878)	.053
	>200 (Ref)						

Note: ^ap <0.05; Ref. = Reference Category; OR = Odds Ratio; HS = High School

Table 45: Influence of Need Factors on ER Visits Among Foreign-born Adults

Need Factors	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
Health Perception	Excellent	0.509 (.250-1.035)	.062	0.514 (.298-.887)	.017 ^a	0.365 (.211-.633)	<.001 ^a
	Very Good	0.571 (.286-1.138)	.111	0.607 (.360-1.024)	.061	0.505 (.303-.841)	.009 ^a
	Good	0.626 (.332-1.180)	.147	0.770 (.472-1.256)	.295	0.736 (.449-1.206)	.224
	Poor (Ref.)						
Functional Limitations	No	0.192 (.087-.423)	<.001 ^a	0.240 (.136-.421)	<.001 ^a	0.523 (.264-1.037)	.063
	Yes (Ref)						
Chronic Illness	No	0.458 (.295-.712)	.001 ^a	0.663 (.479-.919)	.014 ^a	0.694 (.504-.956)	.025 ^a
	Yes (Ref)						

Note: ^a p < 0.05; Ref. = Reference Category; OR = Odds Ratio

Table 46: Influence of Need Factors on Doctor Visits Among Foreign-born Adults

Need Factors	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
Health Perception	Excellent	0.818 (.479-1.397)	.462	1.086 (.712-1.657)	.702	0.459 (.270-.780)	.004 ^a
	Very Good	1.256 (.740-2.130)	.398	1.358 (.893-2.063)	.152	0.676 (.410-1.115)	.125
	Good	0.784 (.467-1.317)	.357	1.197 (.792-1.808)	.393	0.609 (.369-1.006)	.053
	Poor (Ref.)						
Functional Limitations	No	0.539 (.247-1.176)	.121	0.749 (.423-1.326)	.321	0.190 (.101-.358)	<.001 ^a
	Yes (Ref)						
Chronic Illness	No	0.428 (.316-.581)	<.001 ^a	0.375 (.301-.467)	<.001 ^a	0.603 (.454-.802)	.001 ^a
	Yes (Ref)						

Note: ^ap <0.05; Ref. = Reference Category; OR = Odds Ratio

Table 47: Influence of Need Factors on Usual Source of Care Among FBAs

Need Factors	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
Health Perception	Excellent	2.543 (1.419-4.556)	.002 ^a	1.419 (.854-2.355)	.176	1.173 (.717-1.919)	.525
	Very Good	3.119 (1.755-5.545)	<.001 ^a	1.433 (.869-2.362)	.158	1.795 (1.091-2.954)	.021 ^a
	Good	2.109 (1.199-3.711)	.010 ^a	1.115 (.689-1.806)	.657	1.320 (.816-2.134)	.258
	Poor (Ref.)						
Functional Limitations	No	0.568 (.213-1.516)	.258	0.444 (.221-.894)	.023 ^a	0.881 (.366-2.125)	.778
	Yes (Ref)						
Chronic Illness	No	0.364 (.253-.525)	<.001 ^a	0.364 (.276-.479)	<.001 ^a	0.447 (.333-.599)	<.001 ^a
	Yes (Ref)						

Note: ^ap <0.05; Ref. = Reference Category; OR = Odds Ratio

Table 48: Influence of Need Factors on Unmet Needs Among Foreign-born Adults

Need Factors	Label	2013	P	2014	P	2015	P
		OR (95% CI)		OR (95% CI)		OR (95% CI)	
Health Perception	Excellent	0.165 (.078-.350)	<.001 ^a	0.174 (.093-.325)	<.001 ^a	0.249 (.123-.503)	<.001 ^a
	Very Good	0.205 (.102-.412)	<.001 ^a	0.231 (.128-.417)	<.001 ^a	0.503 (.282-.899)	.020 ^a
	Good	0.363 (.187-.704)	.003 ^a	0.308 (.184-.515)	<.001 ^a	0.593 (.331-1.061)	.078
	Poor (Ref.)						
Functional Limitations	No	1.157 (.707-1.893)	.561	0.649 (.321-1.313)	.229	0.434 (.203-.931)	.032 ^a
	Yes (Ref)						
Chronic Illness	No	0.357 (.156-.815)	.015 ^a	1.096 (.739-1.626)	.647	0.937 (.623-1.407)	.752
	Yes (Ref)						

Note: ^ap < 0.05; Ref. = Reference Category; OR = Odds Ratio

Table 49: Influence of Need Factors on Delayed Cost Among Foreign-born Adults

Need Factors	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
Health Perception	Excellent	0.109 (.050-.238)	<.001 ^a	0.188 (.105-.335)	<.001 ^a	0.156 (.083-.293)	<.001 ^a
	Very Good	0.199 (.103-.381)	<.001 ^a	0.333 (.196-.564)	<.001 ^a	0.337 (.197-.577)	<.001 ^a
	Good	0.396 (.216-.725)	.003 ^a	0.376 (.232-.609)	<.001 ^a	0.429 (.253-.726)	.002 ^a
	Poor (Ref.)						
Functional Limitations	No	0.952 (.598-1.514)	.835	0.586 (.295-1.164)	.127	0.472 (.239-.930)	.030 ^a
	Yes (Ref)						
Chronic Illness	No	0.317 (.140-.717)	.006 ^a	0.871 (0.622-1.218)	.418	1.249 (.866-1.799)	.234
	Yes (Ref)						

Note: ^ap <0.05; Ref. = Reference Category; OR = Odds Ratio

Predictors of Health Access among Uninsured FBAs

Logistic regression modeling was used to examine predictors of health care access, based on Andersen's model (predisposing, enabling, and need factors), among uninsured FBAs in the U.S. Multivariate results examining the relationship between access outcomes and predisposing factors (Tables 50 – 54); enabling resources (Tables 55 – 59); and need factors in Tables 60 – 64.

Influence of Predisposing Factors on ER Visits among Uninsured FBAs

Uninsured male FBAs were about 50% less likely to report an ER visit in 2015 (Table 50). Interestingly, uninsured non-white FBAs (including blacks, Asian, and multiple races) were nearly four times as likely to report having made at least one ER visit post-ACA (OR = 4.019, $p < 0.001$), compared with those who self-identified as white (Table 50). Uninsured FBAs from Southeast Asia and the eastern Mediterranean were about 80% less likely to report at least one ER visit in 2015 (Table 50).

Influence of Predisposing Factors on Doctor Visits among Uninsured FBAs

As shown in Table 51, uninsured male FBAs were twice as likely to report a doctor visit in 2013 (OR = 2.176, $p = 0.007$) and 2014 (OR = 1.737, $p = 0.021$), but 50% less likely in 2015 (OR = 0.546, $p = 0.001$) (Table 51). In the same vein, uninsured FBAs from Europe and Africa were about 70% less likely to report doctor visits in 2014 (OR = 0.262, $p = 0.001$) compared with those from the Americas (Table 51).

Influence of Predisposing Factors on Usual Source of Care Among Uninsured FBAs

Uninsured male FBAs were about 70% less likely to have a usual source of care in 2013 (OR = 0.299, $p < 0.001$) and about 50% less likely in 2014 (OR = 0.394, $p < 0.001$) and 2015 (OR = 0.548, $p < 0.001$) (Table 52). Surprisingly, uninsured FBAs from Asia were

approximately three times more likely ($OR = 3.140, p < 0.001$) to report having a usual source of care than FBAs from the Americas (Table 52).

Influence of Predisposing Factors on Unmet Needs Among Uninsured FBAs

Middle-aged uninsured FBAs were about 50% less likely to report unmet needs because of cost compared with older adult FBAs in 2014 ($OR = 0.541, p = 0.017$) and 2015 ($OR = 0.570, p = 0.039$) (Table 53). Uninsured male FBAs were about 40% less likely to report unmet needs because of cost ($OR = 0.640, p = 0.044$), compared with their female counterparts in 2015 (Table 53). Married or partnered uninsured FBAs were about 35% less likely to report unmet needs because of cost, compared with married or partnered FBAs in 2014. Uninsured FBAs from Europe and Africa were more than twice as likely in 2013 ($OR = 2.386, p = 0.047$) and 2015 ($OR = 2.650, p = 0.010$) to report unmet needs, compared with those from the Americas (Table 53).

Influence of Predisposing Factors on Delayed Care Among Uninsured FBAs

Uninsured middle-aged FBAs were about 50% less likely in 2013 ($OR = 0.473, p = 0.015$) and 2014 ($OR = 0.552, p = 0.012$) to report delayed care because of cost compared with older adult FBAs (Table 54). Uninsured male FBAs were about 40% less likely than females to report delayed care because of cost in 2015 ($OR = 0.631, p = 0.026$) (Table 54). Similarly, uninsured FBAs who were married or partnered were about 40% less likely ($OR = 0.629, p = 0.024$) to report delayed care because of cost in 2015, compared with those who were not married or partnered (Table 54). Interestingly, uninsured FBAs from Europe and Africa were about three times as likely to report a delay in care because of cost ($OR = 2.966, p = 0.013$) in 2013, while those from Asia were about 2.5 times more likely ($OR = 2.491, p = 0.011$) to report delayed care in 2014, compared with those from the Americas (Table 54).

Table 50: Influence of Predisposing on ER Visits Among Uninsured FBAs

Predisposing Factors	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
Age	35-54	0.695 (.270-1.790)	.450	0.562 (.258-1.228)	.148	0.997 (.462-2.152)	.995
Gender	Male	0.951 (.392-2.306)	.911	0.487 (.229-1.037)	.062	0.497 (.272-.908)	.023 ^a
Marital Status	M/P	0.424 (.176-1.021)	.056	0.855 (.448-1.631)	.634	1.117 (.627-1.990)	.707
Race	Non-White	1.361 (.361-5.132)	.648	0.827 (.357-1.919)	.658	4.019 (2.099-7.694)	<.001 ^a
	White (Ref.)						
Region of Origin	Europe/Africa	0.807 (.163-3.999)	.792	1.118 (.331-3.778)	.858	0.423 (.163-1.102)	.078
	Asia [†]	1.313 (.303-5.689)	.716	0.977 (.298-3.201)	.970	0.227 (.064-.812)	.023 ^a
	Americas (Ref.)						

Note: ^ap < 0.05; [†] Eastern Mediterranean, and Elsewhere; Ref. = Reference Category; OR = Odds Ratio.

M/P = Married/Partnered; Non-white includes Black, Asian, and multiple races.

Table 51: Influence of Predisposing on Doctor Visits Among Uninsured FBAs

Predisposing Factors	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
Age	35-54	0.653 (.302-1.413)	.278	0.731 (.377-1.417)	.354	0.717 (.441-1.167)	.181
Gender	Male	2.176 (1.239-3.820)	.007 ^a	1.737 (1.085-2.782)	.021 ^a	0.546 (.376-.791)	.001 ^a
Marital Status	M/P	0.709 (.414-1.216)	.211	1.144 (.715-1.831)	.575	1.398 (.967-2.022)	.075
Race	Non-White	0.625 (.239-1.630)	.336	0.750 (.334-1.683)	.485	1.334 (.758-2.348)	.317
	White (Ref.)						
Region of Origin	Europe/Africa	0.515 (.205-1.294)	.157	0.262 (.123-.558)	.001 ^a	1.112 (.542-2.283)	.772
	SE Asia [†]	0.416 .140-1.238)	.115	0.524 (.202-1.356)	.182	1.100 (.495-2.443)	.815
	Americas (Ref.)						

Note: ^ap <0.05; [†] Eastern Mediterranean, and Elsewhere; Ref. = Reference Category; OR = Odds Ratio.
M/P= Married/Partnered; Non-white includes Black, Asian, and multiple races.

Table 52: Influence of Predisposing on Usual Source of Care for Uninsured FBAs

Predisposing Factors	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
Age	35-54	0.939 (.551-1.598)	.815	0.842 (.549-1.290)	.428	0.949 (.576-1.561)	.836
Gender	Male	0.299 (.194-.460)	<.001 ^a	0.547 (.394-.758)	<.001 ^a	0.548 (.387-.777)	.001 ^a
Marital Status	M/P	1.062 (.688-1.640)	.786	0.833 (.688-1.352)	.833	1.230 (.866-1.747)	.248
Race	Non-White	0.690 (.368-1.293)	.246	1.506 (.929-2.441)	.097	1.720 (.976-3.030)	.060
	White (Ref.)						
Region of Origin	Europe/Africa	0.860 (.414-1.785)	.685	0.915 (.469-1.785)	.794	0.515 (.251-1.057)	.071
	SE Asia [†]	0.874 (.412-1.854)	.725	3.140 (1.665-5.920)	<.001 ^a	0.354 (.150-.831)	.017 ^a
	Americas (Ref.)						

Note: ^a*p* <0.05; [†] Eastern Mediterranean, and Elsewhere; Ref. = Reference Category; OR = Odds Ratio.

M/P= Married/Partnered; Non-white includes Black, Asian, and multiple races.

Table 53: Influence of Predisposing on Unmet Needs Among Uninsured FBAs

Predisposing Factors	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
Age	35-54	0.580 (.310-1.084)	.088	0.541 (.328-.894)	.017 ^a	0.570 (.334-.971)	.039 ^a
Gender	Male	1.536 (.923-2.554)	.098	0.963 (.627-1.481)	.865	0.640 (.414-.989)	.044 ^a
Marital Status	M/P	0.902 (.538-1.513)	.696	0.640 (.411-.996)	.048 ^a	0.676 (.441-1.038)	.074
Race	Non-White	0.713 (.369-1.376)	.312	1.015 (.537-1.919)	.964	1.596 (.868-2.935)	.132
	White (Ref.)						
Region of Origin	Europe/Africa	2.386 (1.013-5.618)	.047 ^a	0.885 (.368-2.129)	.785	2.650 (1.262-5.566)	.010 ^a
	SE Asia [†]	0.992 (.447-2.200)	.984	1.681 (.764-3.696)	.196	0.481 (.192-1.206)	.119
	Americas (Ref.)						

Note: ^a $p < 0.05$; [†] Eastern Mediterranean, and Elsewhere; Ref. = Reference Category; OR = Odds Ratio.

M/P = Married/Partnered; Non-white includes Black, Asian, and multiple races.

Table 54: Influence of Predisposing on Delayed Care Among Uninsured FBAs

Predisposing Factors	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
Age	35-54	0.473 (.259-.866)	.015 ^a	0.552 (.347-.879)	.012 ^a	0.609 .364-1.016)	.058
Gender	Male	1.150 (.691-1.914)	.591	1.003 (.676-1.487)	.989	0.631 (.420-.946)	.026 ^a
Marital Status	M/P	0.847 (.507-1.414)	.524	0.798 (.533-1.196)	.274	0.629 (.421-.940)	.024 ^a
Race	Non-White	0.991 (.505-1.944)	.979	1.222 (.671-2.225)	.512	0.871 (.484-1.568)	.645
	White (Ref.)						
Region of Origin	Europe/Africa	2.966 (1.258-6.990)	.013 ^a	1.114 (.510-2.432)	.787	2.018 (.975-4.177)	.058
	SE Asia [†]	1.381 (.621-3.069)	.427	2.491 (1.236-5.020)	.011 ^a	0.626 (.273-1.434)	.267
	Americas (Ref.)						

Note: ^a $p < 0.05$; [†] Eastern Mediterranean, and Elsewhere; Ref. = Reference Category; OR = Odds Ratio.

M/P= Married/Partnered; Non-white includes Black, Asian, and multiple races.

Multivariate results examining the relationship between access outcomes and enabling resources were presented in Tables 55 to 59.

Influences of Enabling Resources on ER Visits Among Uninsured FBAs

As shown in Table 55, compared with those residing in the U.S. for more than 15 years, uninsured FBAs residing in the U.S. from five to 15 years were about 80% less likely to report an ER visits in 2013 (OR = 0.240, $p = 0.016$), and about 70% less likely in 2014 (OR = 0.282, $p = 0.007$) (Table 55). Surprisingly, uninsured FBAs in the Northeast region of the U.S. were about three times more likely in 2015 (OR = 2.906, $p = 0.006$), while uninsured FBAs in the Midwest were about three times more likely to report an ER visits in 2013 (OR = 3.001, $p = 0.046$), compared with those in the South (Table 55).

Uninsured and less formally educated FBAs were three times more likely to report ER visits in 2014 (OR = 2.771, $p = 0.019$) and 2015 (OR = 3.020, $p = 0.038$) compared with FBAs with college degree or higher. Compared with the employed, unemployed and uninsured FBAs were 2.6 times more likely in 2014 ($p = 0.004$) and almost twice as likely to report ER visits in 2015 (OR = 1.926, $p = 0.044$) (Table 55).

Influences of Enabling Resources on Doctor Visits Among Uninsured FBAs

As shown in Table 56, uninsured FBAs who spoke English very well were about 60% less likely to report a physician visit in 2014 (OR = 0.436, $p = 0.016$), compared with FBAs with a limited ability to speak English (Table 56). Unemployed, uninsured FBAs were 50% less likely in 2014 to report doctor visits (OR = 0.543, $p = 0.021$), compared with uninsured FBAs who had a job. Uninsured FBAs in the 100 – 200% FPL group were about 40% less likely to report a doctor visits in 2015 (OR = 0.581, $p = 0.025$).

Uninsured FBAs who spoke English language very well were about 60% less likely to report doctor visits in 2014 (OR = 0.436, $p = 0.016$), compared with their counterparts who did not speak English language well (Table 56). Similarly, unemployed and uninsured FBAs were about 50% less likely to report doctor visits (OR = 0.543, $p = 0.021$), compared with their counterparts who were employed (Table 56). Low-income and uninsured FBAs were about 40% less likely to report doctor visits in 2015 (OR = 0.581, $p = 0.025$) (Table 56).

Influences of Enabling Resources on Usual Source of Care Among Uninsured FBAs

Uninsured FBAs who resided in the Midwest in 2014 were three times more likely to have a usual source of sick care (OR = 3.127, $p = < 0.001$), while those in the Northeast in 2015 were twice as likely, compared with the uninsured FBAs in the South (OR = 1.943, $p = 0.019$) (Table 57). Uninsured FBAs with less than high school diploma were twice as likely to report having a usual source of sick care in 2013 (OR = 2.009, $p = 0.019$) and 2015 (OR = 1.664, $p = 0.045$), compared with those with college degree (Table 57).

Influences of Enabling Resources on Unmet Need Among Uninsured FBAs

Uninsured FBAs residing in the U.S. for five to 15 years were about twice as likely to report having unmet needs because of cost in 2015 (OR = 1.788, $p = 0.018$), compared with those who had lived in the U.S. longer (Table 58). Among uninsured FBAs, those in the <100% FPL group were more than twice as likely to report unmet needs due to cost in 2013 (OR = 2.021, $p = 0.049$) and 2015 (OR = 2.305, $p = 0.005$), compared with their wealthier counterparts (Table 58).

Influences of Enabling Resources on Delayed Care Among Uninsured FBAs

Uninsured FBAs who spoke English very well were almost three times more likely to report delayed care because of cost in 2013 (OR = 2.732, $p = 0.009$), compared with those who spoke little or no English (Table 59). Uninsured and unemployed FBAs were twice as likely to report delayed care due to cost in 2013 (OR = 2.140, $p = 0.014$), compared with employed but uninsured FBAs (Table 59). Likewise, low-income and uninsured FBAs were twice as likely to doctor visit (OR = 1.939, $p = 0.017$), compared with wealthier ($>200\%$ FPL) FBAs post-ACA (Table 59).

Table 55: Influence of Enabling Resources on ER Visits Among Uninsured FBAs

Enabling Resources	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
U.S Residency (Yrs.)	≤5			0.433 (.095-1.969)	.279	1.746 (.606-5.026)	.301
	5->15	0.240 (.076-.761)	.016 ^a	0.282 (.113-.704)	.007 ^a	1.106 (.498-2.455)	.805
Citizenship	No	1.047 (.437-2.511)	.917	0.956 (.423-2.162)	.914	1.066 (.483-2.353)	.875
Language Proficiency	Very High	0.701 (.218-2.254)	.550	1.054 (.407-2.732)	.914	1.924 (.771-4.804)	.161
	High	2.321 (.826-6.522)	.110	1.343 (.624-2.889)	.450	1.765 (.822-3.787)	.145
U.S. Region	Northeast	1.144 (.304-4.302)	.841	1.271 (.373-4.325)	.701	2.906 (1.355-6.230)	.006 ^a
	Midwest	3.001 (1.022-8.808)	.046 ^a	0.847 (.267-2.693)	.779	0.383 (.122-1.202)	.100
	West	0.152 (.042-.549)	.004 ^a	0.884 (.445-1.755)	.725	0.751 (.375-1.505)	.419
Education	<HS	1.367 (.447-4.182)	.583	2.771 (1.183-6.488)	.019 ^a	3.020 (1.063-8.578)	.038 ^a
	HS/GED	1.244 (.391-3.957)	.712	2.802 (.999-7.858)	.050	2.879 (1.031-8.038)	.043 ^a
Employed	No	0.842 (.325-2.181)	.722	2.607 (1.357-5.010)	.004 ^a	1.926 (1.019-3.642)	.044 ^a
FPL	<100%	1.547 (.537-4.452)	.418	1.183 (.562-2.494)	.657	1.106 (.490-2.499)	.808
	100 – 200	0.380 (.112-1.296)	.122	0.861 (.359-2.066)	.737	0.907 (.383-2.147)	.824

Note: ^ap <0.05; Ref. = Reference Category; OR = Odds Ratio; FPL = Federal Poverty Line; HS = High School

Table 56: Influence of Enabling Resources on Doctor Visits Among Uninsured FBAs

Enabling Resources	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
U.S. Residency (Yrs.)	≤5	0.840 (.448-1.577)	.587	0.846 (.373-1.918)	.689	1.393(.659-2.942)	.385
	5->15			0.812 (.458-1.440)	.476	1.464 (.659-2.942)	.090
Citizenship	No	1.289 (.679-2.446)	.437	0.682 (.376-1.237)	.207	0.764 (.942-2.276)	.250
Language Proficiency	Very High	0.818 (.381-1.758)	.606	0.436 (.222-.858)	.016 ^a	1.149 (.658-2.007)	.625
	High	1.706 (.770-3.781)	.187	0.561 (.301-1.048)	.070	1.404 (.871-2.262)	.163
U.S. Region	Northeast	1.648 (.656-4.139)	.287	0.804 (.388-1.664)	.556	1.057 (.603-1.851)	.846
	Midwest	0.844 (.326-2.187)	.727	0.835 (.389-1.792)	.643	1.716 (.930-3.166)	.084
	West	1.146 (.610-2.151)	.671	1.373 (.813-2.318)	.236	1.143 (.749-1.744)	.535
Education	<HS	1.735 (.880-3.421)	.112	1.720 (.901-3.284)	.100	1.530 (.927-2.527)	.096
	HS/GED	1.194 (.559-2.549)	.646	1.483 (.751-2.930)	.256	1.184 (.695-2.017)	.535
Employed	No	1.239 (.616-2.492)	.547	0.543 (.323-.912)	.021 ^a	0.793 (.601-1.443)	.749
FPL	<100%	0.695 (.321-1.504)	.355	1.439 (.799-2.589)	.225	0.893 (.555-1.438)	.641
	100 - 200	0.840 (.402-1.756)	.642	1.204 (.671-2.159)	.534	0.581 (1.036-2.245)	.025 ^a

Note: ^ap <0.05; Ref. = Reference Category; OR = Odds Ratio; FPL = Federal Poverty Line; HS = High School

Table 57: Influence of Enabling on Usual Source of Care Among Uninsured FBAs

Enabling Resources	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
U.S Residence (Yrs.)	≤5			0.362 (.186-.706)	.003 ^a	0.900 (.445-1.819)	.768
	5->15	1.198 (.744-1.928)	.457	0.765 (.515-1.137)	.186	0.894 (.590-1.354)	.596
Citizenship	No	0.838 (.507-1.388)	.492	0.971 (.625-1.510)	.896	1.114 (.699-1.773)	.650
Language Proficiency	Very High	1.511 (.775-2.945)	.225	1.403 (.867-2.271)	.168	1.233 (.707-2.153)	.460
	High	1.381 (.787-2.423)	.260	1.008 (.652-1.557)	.971	1.197 (.757-1.891)	.441
U.S. Region	Northeast	1.425 (.700-2.901)	.328	1.402 (.801-2.455)	.237	1.943 (1.114-3.388)	.019 ^a
	Midwest	1.077 (.467-2.483)	.862	3.127 (1.658-5.900)	<.001 ^a	1.544 (.831-2.872)	.169
	West	0.977 (.608-1.569)	.923	0.805 (.557-1.164)	.249	1.295 (.870-1.929)	.203
Education	<HS	2.009 (1.120-3.605)	.019 ^a	1.496 (.945-2.367)	.086	1.664 (1.011-2.741)	.045 ^a
	HS/GED	1.956 (1.069-3.577)	.030 ^a	1.286 (.804-2.059)	.293	1.438 (.850-2.432)	.176
Employed	No	1.168 (.707-1.929)	.544	0.944 (.655-1.361)	.758	1.306 (.862-1.980)	.208
FPL	<100%	0.683 (.377-1.237)	.208	0.971 (.625-1.509)	.896	0.886 (.557-1.411)	.610
	100 - 200	1.176 (.680-2.035)	.561	0.973 (.634-1.494)	.900	0.745 (.473-1.174)	.205

Note: ^ap <0.05; Ref. = Reference Category; OR = Odds Ratio; FPL = Federal Poverty Line; HS = High School

Table 58: Influence of Enabling Resources on Unmet Needs Among Uninsured FBAs

Enabling Resources	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
U.S Residency (Yrs.)	≤5			0.472 (.192-1.156)	.100	0.507 (.183-1.407)	.192
	5->15	0.860 (.468-1.580)	.626	0.710 (.420-1.199)	.200	1.788 (1.106-2.889)	.018 ^a
Citizenship	No	0.711 (.388-1.304)	.270	1.163 (.628-2.155)	.630	0.630 (.357-1.112)	.111
Language Proficiency	Very High	1.945 (.916-4.129)	.083	1.255 (.673-2.342)	.475	1.379 (.710-2.680)	.343
	High	1.375 (.727-2.599)	.326	1.000 (.569-1.758)	.999	1.278 (.701-2.332)	.423
U.S. Region	Northeast	1.463 (.621-3.449)	.383	1.307 (.616-2.771)	.485	1.198 (.646-2.223)	.566
	Midwest	0.834 (.294-2.366)	.732	1.222 (.557-2.683)	.617	1.031 (.472-2.252)	.939
	West	1.358 (.771-2.392)	.289	1.089 (.671-1.767)	.731	0.796 (.466-1.361)	.405
Education	<HS	0.670 (.342-1.312)	.242	0.729 (.414-1.284)	.274	0.760 (.422-1.372)	.362
	HS/GED	0.690 (.335-1.423)	.314	0.902 (.478-1.701)	.749	0.534 (.275-1.037)	.064
Employed	No	1.541 (.860-2.764)	.146	1.504 (.950-2.382)	.082	1.267 (.776-2.071)	.344
FPL	<100%	2.021 (1.003-4.073)	.049 ^a	1.384 (.746-2.566)	.302	2.305 (1.288-4.127)	.005 ^a
	100 - 200	1.212 (.605-2.427)	.587	1.736 (.921-3.271)	.088	1.115 (.609-2.041)	.724

Note: ^a*p* <0.05; Ref. = Reference Category; OR = Odds Ratio; FPL = Federal Poverty Line; HS = High School

Table 59: Influence of Enabling Resources on Delayed Care Among Uninsured FBAs

Enabling Resources	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
U.S Residency (Yrs.)	≤5			0.841 (.408-1.732)	.638	0.493 (.194-1.255)	.138
	5->15	1.060 (.589-1.907)	.846	0.688 (.425-1.112)	.126	1.083 (.683-1.716)	.735
Citizenship	No	0.594 (.333-1.061)	.078	1.012 (.597-1.715)	.964	0.756 (.442-1.292)	.306
Language Proficiency	Very High	2.732 (1.280-5.831)	.009 ^a	1.335 (.763-2.333)	.311	0.975 (.515-1.847)	.938
	High	1.255 (.663-2.374)	.485	0.924 (.555-1.536)	.759	1.118 (.644-1.941)	.691
U.S. Region	Northeast	0.821 (.337-2.005)	.487	1.420 (.716-2.815)	.315	1.275 (.704-2.310)	.422
	Midwest	0.823 (.313-2.168)	.522	1.445 (.725-2.880)	.295	0.921 (.437-1.941)	.829
	West	1.133 (.648-1.981)	.660	1.297 (.833-2.021)	.250	0.621 (.380-1.014)	.057
Education	<HS	0.686 (.353-1.332)	.265	0.754 (.449-1.266)	.285	0.883 (.502-1.554)	.665
	HS/GED	0.735 (.368-1.538)	.435	0.926 (.523-1.641)	.793	0.637 (.341-1.187)	.155
Employed	No	2.140 (1.170-3.917)	.014 ^a	1.192 (.780-1.822)	.415	1.199 (.746-1.927)	.453
FPL	<100%	1.700 (.832-3.472)	.145	1.431 (.827-2.477)	.199	1.939 (1.129-3.331)	.017 ^a
	100 - 200	1.527 (.767-3.038)	.228	1.093 (.626-1.908)	.755	1.118 (.643-1.942)	.693

Note: ^ap <0.05; Ref. = Reference Category; OR = Odds Ratio; FPL = Federal Poverty Line; HS = High School

Multivariate results examining the relationship between access outcomes and enabling resources were presented in Tables 60 to 64. About 99% of the sample of uninsured FBAs reported having at least one chronic illness in 2014 and 2015. Therefore, chronic illness variable was not included in the model assessing the relationship between access outcomes and need factors for the uninsured FBAs.

Influence of Need Factors on Emergency Room Visits Among Uninsured FBAs

Uninsured FBAs who rated their health status as good or better were about 80% less likely to report an ER visit in 2013 (OR = 0.176, $p = 0.038$), 2014 (OR = 0.179, $p = <0.001$), and 2015 (OR = 0.264, $p = 0.008$), compared with those with poor health status (Table 60). Moreover, uninsured FBAs with no functional limitations were 70% less likely in 2014 (OR = 0.311, $p = 0.011$) and 80% less likely in 2015 (OR = 0.197, $p = 0.040$) to visit the ER compared with those with functional limitations (Table 60).

Influence of Need Factors on Doctor Visits Among Uninsured FBAs

Uninsured FBAs with a health status of good or better were almost three times as likely to report doctor visits in 2013 (OR = 2.873, $p = 0.006$), compared with those with poor health status (Table 61).

Influence of Need Factors on Usual Source of Care Among Uninsured FBAs

Uninsured FBAs who did not have any functional limitations in 2013 were about 60% less likely (OR = 0.368, $p = .040$) to report having a usual source of sick care compared with those with functional limitation (Table 62).

Influence of Need Factors on Unmet Needs Among Uninsured FBAs

In terms of affordability, uninsured FBAs whose health status was good or better were about 90% less likely in 2013, 75% less likely in 2014, and about 60% less likely in 2015 ($p < 0.001$) to report unmet needs because of cost compared with those with poor health status (Table 63). Uninsured FBAs with no functional limitations were about 75% less likely to report unmet needs in 2014 (OR = 0.247, $p = 0.001$) and 2015 (OR = 0.318, $p = 0.018$), compared with those with functional limitations (Table 63).

Influence of Need Factors on Delayed Care Among Uninsured FBAs

Uninsured FBAs whose health status was good or better were 80% less likely to report delayed care due to cost in 2013, and 70% less likely in 2014 and 2015 ($p < 0.001$), compared with their counterparts with poor health status (Table 64). Uninsured FBAs without functional limitations were about 70% less likely in 2013 (OR = 0.319, $p = 0.015$), 2014 (OR = 0.350, $p = 0.013$), and 2015 (OR = 0.318, $p = 0.013$) to report delayed care because of cost compared with uninsured FBAs with functional limitations.

Table 60: Influence of Need Factors on ER Visits Among Uninsured FBAs

Need Factors	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
Health Perception	Excellent	0.176 (.034-.906)	.038 ^a	0.179 (.071-.451)	<.001 ^a	0.264 (.099-.706)	.008 ^a
	Very Good	0.358 (.109-1.175)	.090	0.232 (.098-.546)	.001 ^a	0.377 (.156-.915)	.031 ^a
	Good	0.480 (.183-1.259)	.136	0.261 (.102-.670)	.005 ^a	0.622 (.294-1.318)	.215
Functional Limitations	No	0.504 (.174-1.464)	.207	0.311 (.126-.765)	.011 ^a	0.197 (.066-.587)	.040 ^a

Note: ^ap < 0.05; OR = Odds Ratio; CI = Confidence Interval

Table 61: Influence of Need Factors on Doctor Visits Among Uninsured FBAs

Need Factors	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
Health Perception	Excellent	1.955 (.865-4.416)	.107	0.883 (.418-1.862)	.743	0.596 (.317-1.124)	.110
	Very Good	2.747 (1.122-6.725)	.027 ^a	0.843 (.405-1.753)	.647	0.743 (.399-1.350)	.319
	Good	2.873 (1.355-6.090)	.006 ^a	0.989 (.497-1.966)	.974	0.988 (.572-1.707)	.966
Functional Limitations	No	0.538 (.188-1.537)	.246	1.558 (.594-4.089)	.367	0.647 (.246-1.699)	.376

Note: ^ap < 0.05; OR = Odds Ratio; CI = Confidence Interval

Table 62: Influence of Need on Usual Source of Care Among Uninsured FBAs

Needs Factors	Label	2013		2014		2015	
		<i>OR (95% CI)</i>	<i>P</i>	<i>OR (95% CI)</i>	<i>P</i>	<i>OR (95% CI)</i>	<i>P</i>
Health Perception	Excellent	1.151 (.559-2.370)	.702	0.578 (.332-1.008)	.053	0.706 (.384-1.299)	.263
	Very Good	1.810 (.856-3.824)	.120	0.630 (.362-1.098)	.103	1.042 (.564-1.925)	.895
	Good	1.592 (.802-3.162)	.183	0.617 (.361-1.054)	.077	0.871 (.500-1.517)	.625
Functional Limitations	No	0.368 (.142-.955)	.040 ^a	0.736 (.333-1.625)	.447	0.609 (.244-1.521)	.288

Note: ^ap <0.05; OR = Odds Ratio; CI = Confidence Interval

Table 63: Influence of Need Factors on Unmet Needs Among Uninsured FBAs

Needs Factors	Label	2013		2014		2015	
		<i>OR (95% CI)</i>	<i>P</i>	<i>OR (95% CI)</i>	<i>P</i>	<i>OR (95% CI)</i>	<i>P</i>
Health Perception	Excellent	0.110 (.046-.262)	<.001 ^a	0.255 (.128-.509)	<.001 ^a	0.405 (.192-.854)	.018 ^a
	Very Good	0.203 (.087-.473)	<.001 ^a	0.236 (.121-.463)	<.001 ^a	0.634 (.322-1.250)	.188
	Good	0.242 (.116-.504)	<.001 ^a	0.313 (.168-.585)	<.001 ^a	0.699 (.381-1.286)	.249
Functional Limitations	No	0.502 (.199-1.268)	.144	0.247 (.105-.583)	.001 ^a	0.318 (.123-.823)	.018 ^a

Note: ^ap <0.05; OR = Odds Ratio; CI = Confidence Interval

Table 64: Influence of Need Factors on Delayed Care Among Uninsured FBAs

Needs Factors	Label	2013		2014		2015	
		OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
Health Perception	Excellent	0.165 (.070-.385)	<.001 ^a	0.262 (.136-.507)	<.001 ^a	0.293 (.150-.574)	<.001 ^a
	Very Good	0.285 (.124-.654)	.003 ^a	0.366 (.199-.673)	.001 ^a	0.496 (.260-.948)	.034 ^a
	Good	0.301 (.145-.623)	.001 ^a	0.382 (.215-.679)	<.001 ^a	0.581 (.330-1.020)	.059
Functional Limitations	No	0.319 (.127-.801)	.015 ^a	0.350 (.152-.804)	.013 ^a	0.318 (.129-.785)	.013 ^a

Note: ^ap <0.05; OR = Odds Ratio; CI = Confidence Interval

Chapter Summary

The results of the current study revealed statistically significant differences in indicators of health care access, predisposing and enabling resources after controlling for need factors. Logistic regression analysis showed statistically significant relationships in the influence of various access predictors on health care access across the three studied years examined. Detailed discussions of the study findings were provided in Chapter 5.

CHAPTER 5

DISCUSSION

This predictive, non-experimental, correlational study examined the effects of predisposing characteristics, enabling resources, and need factors on health care access among native and foreign-born adults (FBAs) during the periods before, during, and after the implementation of the Affordable Care Act (ACA). This study was guided by Andersen's behavioral model of health services utilization (Andersen, 1995). A discussion of the study findings is presented in this chapter, as well as implications of the findings in terms of the theoretical framework used, nursing clinical practice, and health care policy. Conclusions and directions for future research projects are given.

Discussion of Study Findings

Everyone either has a health need or knows someone who does. Examining access to health care is imperative to the health of a nation because having adequate access to health care empowers individuals to get the right care from the right provider at the right time. Findings from reviewed evidence show that foreign-born persons experience significant and disproportionate barriers when seeking care for their health needs.

The findings from the current study are summarized in a metanarrative presented in Table 65. John was a 36-year-old young man who worked a minimum paying job in a rural Tennessee town. He was poor, uninsured, and did not have a formal high school education. He migrated to the U.S. in his early 20s from Cambodia to be with his family.

Table 65: Metanarrative of the Study Findings

Andersen's Model Domain	Factors from Metanarrative	Implications
Predisposing Factors	Male	Foreign-born males (Reference group: females), were: • 45% less likely to visit the emergency room • 40% less likely to visit a doctor • 70% less likely to have a USOC Uninsured foreign-born adult (FBAs) males (Reference group: uninsured FBA females) were: • Twice as likely as females (pre-ACA) and 50% less likely to visit a doctor (post-ACA) • 40% less likely to delay care (post-ACA)
	Middle-aged	Middle-aged FBAs (ages 35 – 54) (Reference group: near-elderly or ages 55 – 64) were: • 50% less likely to visit a doctor • 50% less likely to have a USOC Uninsured Middle-aged FBAs (Reference group: uninsured near-elderly FBAs) were: • 50% less likely to forgo and delay care due to cost
	Migrated from a Southeast Asian nation	Compared with FBAs from the Americas: • FBAs from SE Asia nations (along with blacks and multiple races) were four folds likely to visit the ER (post- ACA) Compared with FBAs from the Americas, those from SE Asia, and Eastern Mediterranean was: • 80% less likely to visit the ER (post-ACA) • Three-times more likely to have a USOC (pre-ACA) • 70% less likely to have USOC (post-ACA) • Three times more likely to delay care

Table 65: Metanarrative of the Study Findings (Continued)

Andersen's Model Domain	Factors from Metanarrative	Findings from Current Study
Enabling Resources	No formal education	FBAs with HS/GED or less were (Reference group: FBAs with college degree or higher): • Three times as likely to visit the ER (post-ACA) • 50% less likely to delay care due to cost
	Uninsured	Compared with adequately insured FBAs, uninsured FBAs were: • 60% less likely to visit the ER • 70% less likely to visit a doctor • 90% less likely to have a usual source of sick care • Four times more likely to have unmet needs & delayed care due to cost
	U.S. Residency (>15 years)	Newly arrived (<5 yrs.) & those with 5-15 yrs. U.S. residency (Reference group ≥15 yrs.) were: • 80% less likely to visit the ER (pre-ACA) • 80% less likely to have USOC (pre-ACA) • 60% less likely to have a USOC • Twice as more likely to forgo care (post-ACA)
	Limited English Language proficiency (LEP)	FBAs with high English language proficiency (Reference group: uninsured FBAs with LEP) were: • 60% less likely to visit a doctor • Three times more likely to delay care (pre-ACA) due to cost
	U.S. region: South	Compared with uninsured FBAs from the South, uninsured FBAs in the: • Midwestern U.S. region were three times more likely to visit the emergency room (pre-ACA) • Midwestern U.S. region were three times more likely to have a usual source of sick care (pre-ACA) • Western U.S. region were 85% less likely (pre-ACA) • Northeastern U.S. region were three times more likely to visit the emergency room (post-ACA) • Northeastern U.S. region twice more likely to have a usual source of care (post-ACA)
	Low income (≤200% of FPL)	Low-income FBAs (Reference group: >200% of FPL) were: • Twice as likely to visit the emergency room in 2014 • Almost 40% Less likely to visit a doctor in 2014 • Twice as likely forgo and delay care due to cost in 2014

John was diagnosed with adult-onset diabetes in his early 30s. He has limited English language proficiency. The fear of not understanding instructions from health care providers or not being understood discouraged John from seeking diabetes management. Fast forward and John is now 64 and has developed an ulcer on his leg, which failed to heal over a period of time. John's family convinced him to seek care in the emergency room (ER). However, within few hours in the ER, John realized that the discoloration on his leg was a sign that it had become gangrenous. He needed an urgent limb amputation.

Findings from the current study show some commonalities in access to health care among both native and FBAs in the U.S., including certain demographic factors such as socioeconomic status, education, possession of insurance, employment, age, gender, and region of residence in the United States. However, as illustrated in John's metanarrative, there are multi-level health care access challenges faced by FBAs with which native-born persons do not necessarily have to cope. The current study also showed that health care access for FBAs is driven by specific factors unique to this population, such as years of residence in the U.S., language barriers, and racial/ethnic background. Therefore, deploying a 'one-size-fits-all' approach to addressing health care access barriers for FBAs is not adequate.

Reflecting on the American Nurses Association Standard 5 (Douglas et al., 2011), which addresses cultural competence in health care systems and organizations, cultural congruence in practice describes nursing care that aligns with the care recipient's viewpoints, personal and cultural values, beliefs, practices, traditions, and rituals (Douglas et al., 2011). Through the nursing lens in fulfilling cultural competence, nurses must demonstrate awareness that each consumer-provider encounter is influenced by the culture of the nurse and the patient. One

approach is to apply linguistically appropriate services, which Douglas et al. (2011) described as a valuable component of culturally competent health systems.

Given the heterogeneity of foreign-born population, understanding cultural differences can help nurses to refrain from overgeneralizations and stereotypes that may negatively influence care outcomes (Douglas et al., 2011). Nurses and health care organizations should demonstrate understanding that cultures have diverse beliefs and values about health. Some of these beliefs could be deeply rooted in FBAs' traditions and cultural values from their native countries and must be considered to achieve the best possible outcome in health and health care. The findings from this study also highlighted anticipated and potentially discrepant findings in terms of relationships among various dimensions of health care access for FBAs, which are further discussed below.

Expected Findings

As previously identified in prior studies by Wilper et al. (2009), Yun et al. (2016), Bustamante et al. (2012), Salinas et al. (2015), and Reyes and Hardy (2015), findings from the current study affirm that insurance remains a strong predictor and continued gatekeeper of access to health systems during the studied years. Even though most states in the southern region (except Louisiana and Arkansas) have not expanded Medicaid programs under the Affordable Care Act (ACA) (Bustamante et al., 2018), most of the studied sample reported having insurance. A steady rise in the of proportion of the population that was insured and a decline in the uninsured proportion among the full studied sample, including both native and FBAs during pre-ACA and post-ACA periods is shown in Figure 2.

As shown in Figure 3, there was a rise in insurance coverage among both citizens and noncitizens. The gap between citizens and noncitizens by insurance coverage, which was 28% during the pre-ACA period had slightly narrowed to 25% during the post-ACA period. These findings showed promising results in terms of insurance coverage among those groups.

Among FBA populations, those who were uninsured, male, married or partnered, noncitizen, and those with lower incomes were more likely to underutilize health care and more likely to forgo or delay care as a result of cost. However, these findings were not notably different when drawing a comparison between the pre- and post-ACA implementation periods. Current study findings also showed that most (38%) of the respondents in the studied sample resided in the South compared with other U.S. regions. This finding builds on prior work by Lopez, Bialik, and Radford (2018), who previously reported that 33% of FBAs resided in the South using data from the Pew Research estimations.



Figure 2: Proportion of Native and Foreign-Born Adults by Insurance

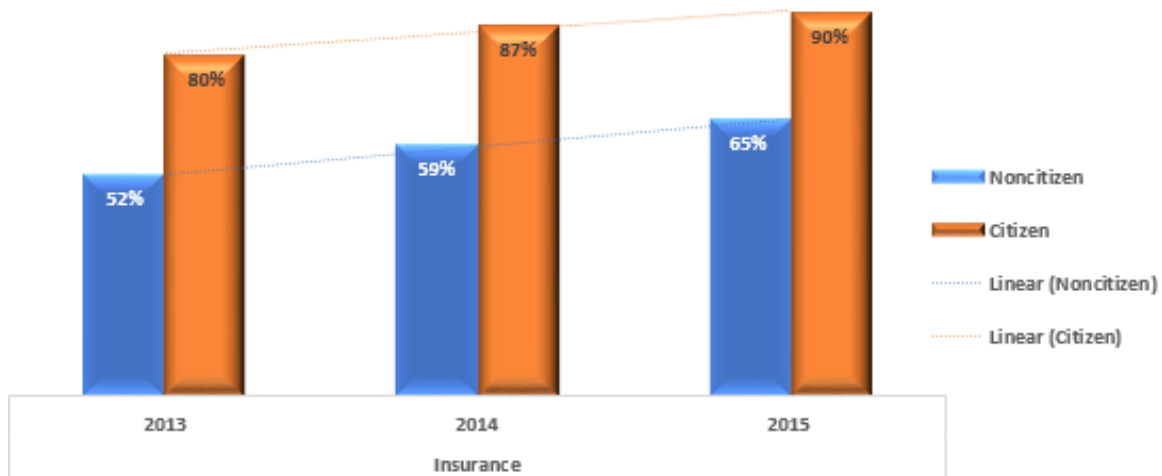


Figure 3: Proportion Insured by Citizenship Status

In a prior state-wide analysis using the California Health Interview Survey, Bustamante and colleagues noted underutilization of health services among undocumented FBAs occur for various reasons, including demographic, behavioral, and socioeconomic factors (Bustamante et al., 2012). It also was previously noted that unauthorized FBAs mostly reside in metropolitan areas (Lopez et al., 2018) and were more likely to be uninsured because of employment instability (Prentice, Pebley & Sastry, 2005). Currently, the National Health Interview Survey (NHIS) lacks identifiers for legal and documentation status of FBAs, precluding further assessment of factors that enhance or deter health care access among these groups.

Married or partnered FBAs in the studied sample were less likely to report unmet needs and delayed care across all three years examined. Although little was known before this study about the direct effects of marital status on health care access among FBAs, prior studies had shown that, in general, married persons tend to enjoy access to better health benefits compared with their unmarried counterparts (Choi and Mark, 2011). In a prior study aimed at examining

differences in survival rates by marital status in the U.S. using data from the NHIS, Kaplan and Kronick (2006) found that mortality rates for unmarried adults in the U.S. were significantly higher when compared with those who were married or living with a spouse. It is possible that the effects of financial stability and emotional support from a marital partner could explain overall lower use of ER services, higher utilization of preventative services, and lower reports of unmet needs and delayed care among the married and partnered FBAs seen in this study.

Newly arrived FBAs (less than five years of U.S. residency) and noncitizens were less likely to have a usual source of care pre-ACA, while those who had resided in the U.S. from five to 15 years were less likely to visit the ER pre-ACA compared with FBAs living in the U.S. for more than 15 years. However, uninsured newly arrived FBAs living in the U.S. for less than five years were twice as likely to report unmet needs. These findings further build on prior work by Chi and Handcock (2014) who noted that newly arrived FBAs tend to underutilize health care services.

While the reasons for underutilization of health services among newly arrived FBAs are unclear, results from the current study support prior findings by Chi and Handcock (2014) who estimated that underutilization of health services might be linked to possession of health insurance, English language proficiency, and availability of financial resources among this population. The findings were also in congruence with previously noted findings by Ye et al. (2012), who noted that noncitizens are more likely to be uninsured and have a relatively decreased ability to obtain health care compared with citizens. Moreover, noncitizens are less likely to use preventative health care services, more likely to lack a usual source of sick care, and less likely to seek timely preventative screenings (Lebrun & Dubay, 2010; Lee & Choi, 2009).

Before leaving native countries, specific foreign-born subgroups, including refugees and asylees, may have been exposed to violence, rape, emotional torture, and endured traumatizing experiences. These individuals may not know where or how to seek help upon arrival in the U.S. (Singh et al., 2013). Further studies are needed to examine how the context of immigration could influence health care access among various foreign-born subgroups.

Findings from the current study also build on the recent work of Bustamante et al. (2018), who noted that FBAs who had resided in the U.S. for more extended periods were more likely to seek care compared with their newly arrived counterparts. It is possible that unlike acculturated FBAs, newly arrived FBAs may not have the ability and familiarity to effectively navigate health systems, which could contribute to underutilization of the health systems (Chi and Handcock, 2014). It is also possible that differences in health care utilization among newly arrived compared with longer-staying (>15 years of U.S. residency) FBAs could be related to insurance eligibility restrictions among noncitizen, lawfully present FBAs and the five-year waiting period for Medicaid eligibility (Salami, 2017). Future studies could consider health care access differences by years of residence based on the timing of implementation of the ACA.

Findings from this study revealed that citizens, women, older adults, respondents with a poorer health status, and those with at least one chronic illness more frequently reported an ER visit. The observed differences in reported ER visits by citizenship status are in line with a prior study by Tarraf and colleagues, who found increased use of emergency services among native-born and naturalized citizens compared with foreign-born noncitizen adults (Tarraf et al., 2014). Although distinctions on the reason for ER visits among this population was beyond the scope of current analysis, it is possible that ER visits among women may include gynecological or early

prenatal care, which would not apply to men. Such relationships should be examined in a future study.

Using a nationally representative data set in a prior study, Ye et al. (2012) found that Asian women were more likely than Asian men to have increased access to and utilization of preventative care. An intuitive reason for overreliance on ER services versus the use of a primary source of preventative care for treatment of both acute and chronic illnesses may result from being uninsured or underinsured, inability to afford care, or inadequate familiarity with the health system. Direct measurement of the ease of scheduling appointments, the availability of health care providers (especially in rural areas), the accessibility or proximity of care, and accommodations for those who have disability challenges were outside the bounds of the current study. These factors should be considered in future studies examining health care access for FBAs.

Discrepant Findings

In the current study, participants with limited formal education (high school diploma or less) and those with incomes less than 100% of the federal poverty line (FPL) more frequently reported doctor visits pre-ACA, while wealthier respondents and those who were college graduates more frequently reported doctor visits post-ACA. As shown in Figure 4, among FBAs, descriptive analysis findings revealed a sharp decline in doctor visits pre- to post-ACA.

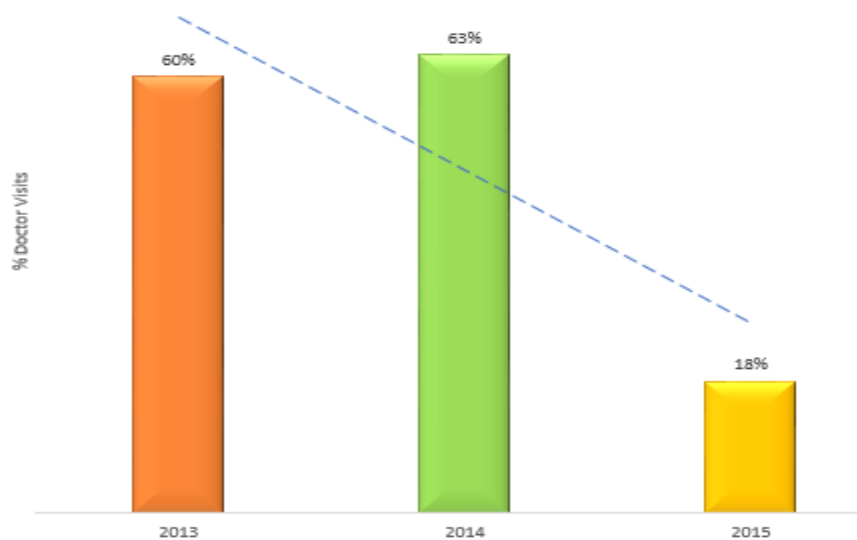


Figure 4: Differences in Doctor Visits by ACA Implementation Timing

The reason for this decline in doctor visits is not clearly understood. However, it is worth mentioning that the survey question intended to capture doctor visits was broadly phrased for respondents to indicate whether they had spoken with or visited a general physician. The survey question did not make distinctions regarding the location or setting in which the patient-physician encounter might have taken place. Therefore, it is possible that physician contacts in the ER, primary care, and sick visits were included in the survey response. These early findings regarding health care utilization disparities relative to the timing of ACA implementation should be examined further in future studies.

Regardless of the context and setting of care, one can argue that because the same groups of FBAs in the study more frequently reported forgoing needed care because of cost, it is possible that the decline in health services utilization among the poor and those with less than formal education, specifically post-ACA, may be related to inability to afford medical bills. Another possibility was noted in a recent study by Bustamante et al. (2018) using a nationally

representative data set to examine insurance coverage pre-and post-ACA. The authors opined that noncitizens were more likely to cluster in geographic areas with a shortage of physicians, thereby relying on nonphysicians, such as advanced practice clinicians, for their health needs. Because the survey question was for respondents to report contact with a general physician, one may not be able to capture visits to nonphysicians with this response.

Findings from the current study revealed that FBAs from Southeast Asia were three times more likely in 2014 to report delayed care due to cost, after controlling for perceived and evaluated needs, compared with those from the Americas (i.e., Mexico, South and Central America, and the Caribbean). In a prior study by Du and Xu (2016) delayed use of medical care was negatively associated with self-rated physical and mental health status among Asian respondents. Results from the current study build on the previous argument by Du and Xu (2016), who noted that negative environmental factors in FBAs' host countries, including the level of acceptance, structural inequalities, perceived discrimination, and acculturation experiences might play a role in shaping perceptions of health status. One may not fully understand the reasons for delayed care among this foreign-born subgroup, but further studies could examine the effects of the specific contextual factors mentioned above, which were impossible to assess by the person-level responses used in current study.

Regarding U.S. region of residence, it was interesting to find in this study that FBAs who resided in the Northeast and Midwest regions of the U.S. were up to three times more likely to report having a usual source of sick care than those who resided in the South. Even after controlling for insurance coverage, FBAs in northeastern and midwestern regions were still three times more likely to report an ER visit and twice as likely to report having a usual source of sick

care post-ACA compared with FBAs who resided in the South. The reasons for these regional differences are unclear and should be examined in future studies further.

Overall, the findings from the current study show promising results in terms of health insurance coverage in the pre- and post-ACA periods, but also that possessing an insurance card does not necessarily mean one can afford health services. The current analysis examined access predictors using a nationally representative data set with cross-examination of regional differences. Consideration could also be given to using statewide data in future studies to compare access to care among various groups of citizens and noncitizens, pre- and post-ACA, with a comparison between Medicaid expansive and non-expansive states.

Implications for Health Care Policy

Findings from the present study could be instrumental in informing policymakers regarding the current state of health care access for this vulnerable population. Governmental policies related to immigration play a significant role in the relationship between duration of stay in the U.S. and overall eligibility of public health benefits. Findings from this study set the stage and serve as a roadmap for influencing immigration-related policies and how such policies determine foreign-born persons' access to the health system.

Given the rates of growth in the population of foreign-born persons in the U.S., it is reasonable to address health care inequities to improve public and population health further. Based on the findings from this study, one can contend that meaningful measures to reduce health care inequities and improve health care access should be addressed as a national issue through national policies rather than being left to fragmented state-level programs.

The ACA was perhaps an ambitious measure on the national level by the U.S. federal government to address disparities related to insurance coverage. Enacted in 2010 with major

provisions implemented in 2014, the primary goals of the ACA were to expand access to insurance coverage and reduce health care spending. The legislation redirected the focus of both health care and insurers away from reactive to preventive medical care. At the time the ACA was enacted, it was assumed that every state would expand Medicaid eligibility to individuals earning less than 138% of the FPL (Borelli, Bujanda & Maier, 2016).

Before the ACA, the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 added restrictions on the eligibility for Medicaid for legally present foreign-born persons. This law placed a five-year restriction, when applicable, for foreign-born persons whose entry into the U.S. occurred on or after August 22, 1996 (Salami, 2017). However, certain groups were exempt from the five-year waiting period, including refugees and veterans. Currently, unauthorized foreign-born persons do not qualify for federal health insurance coverage, and are only eligible for more distinct programs, such as emergency medical assistance under Medicaid, certain services in federally qualified community health centers, and specific public health programs (Salami, 2017). Under the ACA, lawfully present, foreign-born persons were eligible to enroll in health insurance plans from either state or federal insurance exchanges.

Woolhandler and Himmelstein (2017) described insurance as the entryway to medical care, with insured status aimed at saving lives and relieving suffering while limiting the untoward effects of high medical bills. The results of the current study provide information for decision makers at state and national levels to consider in terms of developing performance measures of equity in access to health care and explore opportunities for improvement. Findings from the current study support the fact that health insurance coverage continues to play a significant role in ensuring access to health care for both native- and FBAs. For instance,

uninsured FBAs were three times more likely as those with insurance to report unmet needs and delayed care because of cost.

Overall, implementation of the ACA has been credited with a decline in the number of uninsured Americans, and the current study confirms these prior assertions. However, as of 2017, about 28 million Americans remained uninsured (Woolhandler & Himmelstein, 2017). As of January 2018, 37 states had adopted Medicaid expansion under the ACA (details of current U.S. regional distribution by Medicaid Expansion decision from the Kaiser Family Foundation are shown in Figure A-6 in the Appendix section, compared with fewer Medicaid expansive states in 2015 (Figure A-5 in the Appendix section). Artiga et al. (2016) estimated that Blacks/African Americans were twice as likely as Whites to fall into the Medicaid coverage gap that exists in the states that have not expanded Medicaid, most of which are in the South.

Findings from the current study revealed that, compared with those who resided in the South, FBAs in the Northeastern and Midwestern regions of the U.S. were three times likely to visit the ER in 2013, and more likely to have a usual source of care in 2013 and 2015, though this relationship was not statistically significant in 2014. While there were substantial differences in terms of comparison pre-and post-ACA, these findings further support the previous assumption regarding the significance of Medicaid expansion in increasing access to insurance and, ultimately, improving access to health care for both native-born and FBAs.

Apart from the influence of federal program restrictions and immigration enforcement on health care access for FBAs in the U.S. in terms of insurance, findings from the current study point out the influence on health care access of certain factors specific to being foreign-born, for example length of U.S. residency, citizenship status, and English language proficiency. This

information may inform policy solutions targeted directly at improving access to health care among the most vulnerable foreign-born groups.

Implications for Clinical Practice

The findings showed promising results in rates of insurance coverage among citizens and noncitizens. The findings highlight the closing of the gap between insurance coverage for both groups from the period before and after the implementation of the ACA. These findings are in accord with those from a recent study by Bustamante et al. (2018). In their analysis, those authors found that despite historical restrictions in eligibility for certain health insurance access benefits based on years of residency in the U.S., the coverage gap that existed among citizens and noncitizens in the U.S. had narrowed after the ACA was implemented. However, current study findings showed that noncitizens are still disproportionately represented in the uninsured group.

With the projected rise in foreign-born population in the U.S., access to health care among this population becomes paramount when examining measures to improve population health further. Over 26 million individuals in the U.S. in 2016 reported limited English proficiency (Zong et al., 2018). Ongoing cultural competence among health care providers is needed to understand fully the health needs specific to this group. To further mitigate the effects of language barriers during health care encounters, consideration should be given to using institutional interpreter services. These measures could be of tremendous relevance in meeting cultural and linguistic competency and perceived unmet needs of FBAs in the U.S., particularly those in regions of the country with higher proportions of newly arrived foreign-born persons.

Implications for the Theoretical Framework Used

Current study findings further highlight the complexity of health care access as a construct. The Institute of Medicine, now the National Academy of Medicine (NAM), defined access to health care as the timely use of personal health services to attain the best health outcomes (Nelson, 2002; IOM, 2002). Expanding further on the definition by the NAM, Ricketts and Goldsmith (2005) gave a more encompassing representation of access as a critical measure for examining the dynamics of the organization, financing, and delivery of health care services. Thus, examination of access must address three factors: an individual's ability to gain entrance into the health care system, the ability to reach the geographic location where needed health care services are rendered, and the ability to find a health care provider with whom one has a good personal relationship.

The current study was guided by Andersen's behavioral model of health services utilization (Andersen, 1995) (original version is shown in Figure A-4 in the Appendix section), with the primary focus of the analysis on individual-level characteristics as these relate to health care access and utilization. However, one can argue that health care access is not only dependent on person-level factors, but the influence of contextual or institutional factors must be considered as well.

As shown in Chapter 1, the original Anderson's model was further adapted for use in this study to include the critical factors of health equity and social justice. It was also found that at the person-level, Andersen's model is limited by poor focus on contextual and institutional factors related to health-care for foreign-born persons. Upon further reflection on the dynamics of health care access, Penchansky and Thomas's model of access was revisited. Penchansky and Thomas (1977) defined access as fit or balance between the dynamics of the health system

providing services. The expectations or perceptions of potential or actual recipients of care can be measured with the dimensions of availability, accessibility, accommodation, affordability, and acceptability (Adegboyega & Hatcher, 2015). These dimensions informed the development of a working model based on the results of this study.

Findings from the current study revealed that factors relating specifically to FBAs, such as years of residence in the U.S., citizenship status, race, geographic region of origin, and English language proficiency, continue to influence access to health care for this vulnerable population, regardless of insurance status and need factors. One could argue that addressing access to health care for FBAs should involve a more comprehensive approach by taking into account institutional, contextual, and person-level factors to determine measurable outcomes of care. Before this study, little scholarly attention had been given to the development of a model that could be directly applied to the health care access of FBAs. This gap in the literature guided the development of a working model of FBAs' access to health care (Figure 5).

As shown in Figure 5, this working model was conceptualized to include health equity and social justice as a stronghold or 'roof' under which access to health care by FBAs was framed. The next level includes contextual factors related to institutional characteristics of the health care system, political and economic conditions, and the influence of immigration policies. The predisposing factors in the working model extend beyond demographic factors and incorporate personal and cultural beliefs, genetic components, and personal acceptability of care.

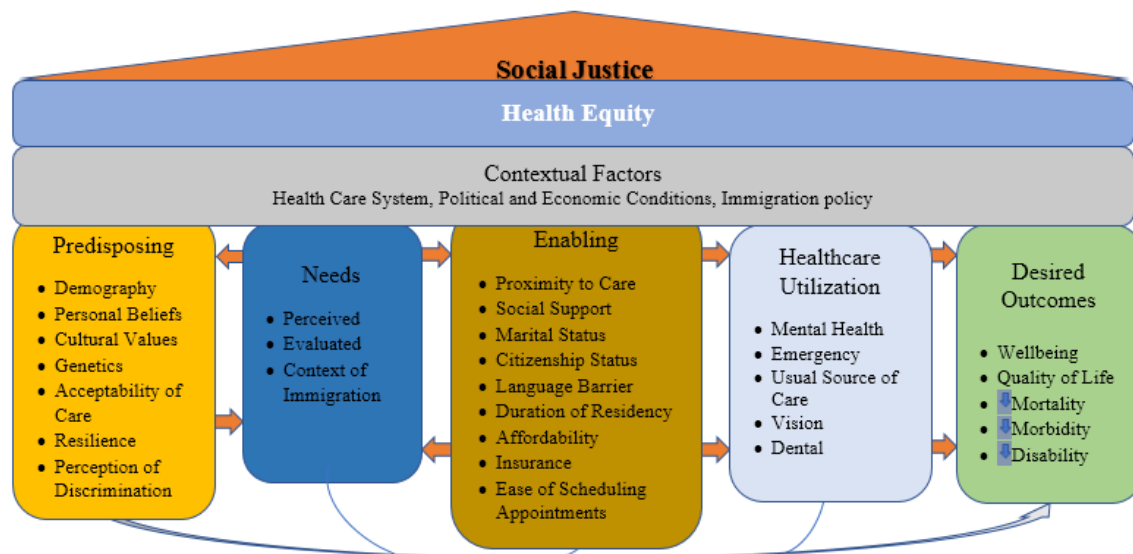


Figure 5: Working Model of Health Care Access by Foreign-Born Adults in the U.S.

In a review by Keboa, Hiles, and MacDonalds (2016), FBAs' access to health care was dependent on a constellation of factors, including the health care system and policies of the host country, societal and personal beliefs, and attitudes towards health. Thus, the need factors in the working model encompass the perceived and evaluated health care needs within the context of immigration, for instance, exposure to infectious diseases or toxic agents, as well traumatic experiences during migration from the country of birth.

The working model emphasizes the importance of accessibility to the location of care, availability of social support, and the accommodation or ease of scheduling an appointment within the enabling resources. Likewise, the use of health care extends beyond having a usual source of care, doctor visit, or ER visit, and includes the addition of mental health, vision, and oral care. Perhaps the highpoint of the working model is the conceptualization of access to health care as a process that navigates an individual through health care encounters and the identification of outcomes as the endpoint of care.

Desirable endpoints of health care encounters considered in the working model include overall improvement in wellbeing and quality of life, as well as declines in the rates of mortality, morbidity, and disability. The current study is well positioned as a first step to guide future scholarly directions to examine these endpoints since previous studies by Wilper et al. (2009) and Woolhandler and Himmelstein (2017) found a strong link between having insurance and overall decline in all-cause mortality. Likewise, a landmark 2002 IOM report on the effects of possessing health insurance on overall health status among nonelderly adults in the U.S revealed that the uninsured tend to have a poorer health status and die younger than their insured counterparts. Although assessment of these long-term health outcomes by insurance status was beyond the scope of the current study, future studies could define these outcomes.

Implications for Future Research

Several possible scholarly directions that emerged from the current research have already been discussed in this chapter. Future research on health care access for FBAs could consider some of the limitations of the current analysis. First, researchers who design national health surveys should consider oversampling foreign-born populations in a way that corresponds to oversampling procedures already used for racial and ethnic minority groups. Adequate sample sizes increase the chance of detecting differences between groups if such a relationship exists.

Although a more significant proportion of the participants in studied samples self-reported high English language proficiency, prior analysis by Zong et al. (2018) showed that about 9% of U.S. residents in 2016, aged 5 and older, had limited English language proficiency. Currently, the languages used in the NHIS interview include English, Spanish, and “others.” Future health surveys should consider inclusion of languages other than English and Spanish. Expanding survey language options could limit linguistic isolation, especially among newly

arrived foreign-born persons. Such inclusion could increase external validity and overall generalizability of the survey.

Further considerations for future research include the addition of survey questions that would enable more targeted measures and analyses of experiences, knowledge, and perceptions of foreign-born persons about navigating the U.S. health care system. Such targeted measures should be focused on care related to preventative, dental, mental health, vision, and medical care. Other migration-related elements affecting health should be considered, including measures of acculturation, perceived racism, stigmatization or discrimination, personal health beliefs and values, cultural beliefs, and perceptions of cultural competency among health care providers in their host country. Similarly, field-based inductive qualitative approaches, including semi-structured interviews and focus groups, could provide helpful context from foreign-born persons' perspectives about how these factors influence access to health care in the U.S.

The current study focused primarily on adults between the ages of 35 to 64 years. Focusing on the nonelderly FBAs ensured the largest possible sample size was obtained within the scope of current study. Future research could consider examining health care access challenges experienced by elderly and younger groups of foreign-born persons to capture the current state of access among these groups better.

Finally, further research is needed to develop and test the proposed working model to determine the interplay among various dimensions of health care access identified in the current study and how these equate to the assessment of health outcomes among FBAs. Such outcome assessments could inform state-wide and national efforts to reduce health disparities and monitor future trends in health equity and social justice in dynamic economic, political, and policy-driven environments.

Conclusion

This study addressed the influence of Affordable Care Act (ACA) and factors predicting health care access among FBAs in the U.S. The study was guided by Andersen's model and framed within the basic tenets of health equity and social justice. As previously posited by Andersen (1995), equitable health care access occurs when health care use is determined by predisposing and need factors, while inequitable health care access occurs when health care utilization is defined by enabling resources. Accounting for perceived and evaluated needs, findings from the current study showed that access to and use of health care services among FBAs is mostly driven by enabling resources. Thus, one can conclude that health care for FBAs in the U.S. may be inequitable. This finding supports the hypothesis for this study and builds on the previous work of Lee and Choi (2009), who noted that health care access for foreign-born persons in the U.S. is inequitable.

The focus of the current study was to examine access predictors, using NHIS data before, during, and immediately after implementation of the ACA. However, further research is needed to investigate how these factors continue to influence access to health care among both native-born and FBAs after 2016. In the same vein, future studies should consider how contextual, institutional, and other person-level factors denoted in the proposed working model equate to long term health care outcomes among this underserved population.

Immigration-related reforms and debates in the U.S. have predominantly focused on unauthorized FBAs. However, according to the Pew Research Center, about three-quarter of FBAs in the U.S. are legally present (Radford & Budiman, 2018). Such national debates often fail to recognize the majority. Reflecting on the essence of health equity as a nation, we must strive to ensure that no one is denied the opportunity to be healthier because of who they are,

where they live, or how much money they make. The findings from this study signal opportunities for stakeholders, including policymakers, health care providers, lawmakers, social workers, nursing educators, social activists, and community leaders, to develop programs to reduce health disparities further.

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APPENDIX

Institutional Review Board

The list of public use data sets that follows has been reviewed by the University of Tennessee, Knoxville, IRB with the intent of making these data files available for use with no further review by the UTK IRB necessary, as long as the following criteria are met:

- Research will not involve any merging of any of the data sets in such a way that individuals might be identified, and
- The researcher will not enhance the public data sets with identifiable, or potentially identifiable data.

Investigators who wish to have additional data sets added to the inventory may submit to the IRB for review a [Public Data Set Nomination Form](#). If the IRB finds upon review that the additional data set meets the established criteria, it will be added to the inventory.

UT, Knoxville Inventory of Public Use Data Sets

Users of public use data sets do not need to submit an IRB application to use such files or seek a determination that the use of the public data files meets the criteria for being exempt from IRB review.

Institutional Review Board

Development

Centers for Disease Control
and Prevention including the
National Center for Health
Statistics

Public data sets including but not limited to the following:

- [Behavioral Risk Factor Surveillance System \(federal level only\)](#)
- [Longitudinal Studies of Aging](#)
- [National Ambulatory Medical Care Survey \(NAMCS\)](#)
- [National Center for Health Statistics](#)
- [Hispanic Health and Nutrition Examination Survey \(HHANES\)](#)
- [National Health and Nutrition Examination Survey \(public data only\)](#)
- [National Health Interview Survey](#)

Figure A-1: Institutional Review Board: Exempt from Review



Completion Date 05-Sep-2016
Expiration Date 05-Sep-2019
Record ID 20576363

This is to certify that:

Shade Adigun

Has completed the following CITI Program course:

Biomedical Research - Basic (Curriculum Group)
Biomedical Research - Basic/Refresher (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

University of Tennessee-Knoxville

CITI
Collaborative Institutional Training Initiative

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Figure A-2: Collaborative Institutional Training Initiative Program Certificate

Table A-1: 2013 to 2015 Data Dictionary (Source NHIS)

<i>Variable</i>	<i>Original Name</i>	<i>Renamed</i>	<i>Value</i>	<i>Recoded Value</i>
<i>Access Factors (Sample Adult Files)</i>	AHERNOY2	ER Visit	# times in ER/ED, past 12 m? 0= None; 1= 1; 2 = 2-3; 3 = 4-5; 4 = 6-7; 5= 8-9; 6 = 10-12; 7 = 13 -15; 8 =16+; 97 = Refused; 98 = Not ascertained; 99 = Don't know	1 = Yes (1 -8) 0 = No (0) separate category 3 = 7, 8 , & 9)
	AHCSYR9	MD Visit	Seen/talked to a general doctor, past 12 m; 1 = Yes, 2 = No, 7 = Refused, 8 = Not ascertained, and 9 = Don't know	0 = No; 1 = Yes
	AUSUALPL	Usual Source of Care	1 = Yes, 2 = There is no place, 3 = there is more than one place, 7 = Refused, 8 = Not ascertained, and 9 = Don't know	2 = 0 (No) 1 and 3 = 1 (Yes)
	PDMED12M	Delayed Care Cost	DURING THE PAST 12 MONTHS, has medical care been delayed for {person} because of worry about the cost? (Do not include dental care) 1 = Yes; 2 = No; 7 = Refused; 8 = Not ascertained; 9 = Don't know	0 = No; 1 = Yes
	PNMED12M	Unmet Needs	DURING THE PAST 12 MONTHS, was there any time when {person} needed medical care, but did not get it because {person} couldn't afford it? 1 = Yes; 2 = No; 7 = Refused; 8 = Not ascertained; 9 = Don't know	0 = No; 1 = Yes

Responses with “unknown,” “not ascertained,” “refused,” and “don’t know” values were not included in data analyses; HS (high school).

Table A-1: 2013 to 2015 Data Dictionary (Continued) (Source NHIS)

<i>Variable</i>	<i>Original Name</i>	<i>Renamed</i>	<i>Value</i>	<i>Recoded Value</i>
Enabling Factors (Person and Family [FPL] files)	YRSINUS	Duration of U.S. Residency	1 = Less than 1 year 2 = 1 yr., less than 5 yrs. 3 = 5 yrs., less than 10 yrs. 4 = 10 yrs., less than 15 yrs. 5 = 15 years or more 9 = Unknown	1 & 2 = 1 (≤ 5 yrs) 3 & 4 = 2 (5 - 15 yrs) 5 = 3 (≥ 15 yrs) Non-response/system missing = 4
	CITIZENP	Citizenship Status	1 = Yes, citizen of the United States, 2 = No, not a citizen of the United States, 7 = Refused, 8 = Not ascertained, 9 = Don't know	1 = Yes 0 = No Removed 7, 8, & 9
	ENGLANG	English Language Proficiency	1 = Very well; 2 = Well; 3 = Not well 4 = Not at all; 7 = Refused; 8 = Not ascertained; 9 = Don't know	1 = 1 (very high); 2 = 2 (high); 3 & 4 = 3 (Low)
	REGION	U.S. Region	1 - Northeast, 2 = Midwest, 3 - South, 4 = West	1 - Northeast; 2 = Midwest; 3 - South; 4 = West
	RAT_CAT3	Federal Poverty Line	Ratio of family income to the poverty threshold 01 Under 0.50 02 0.50 - 0.74 03 0.75 - 0.99 04 1.00 - 1.24 05 1.25 - 1.49 06 1.50 - 1.74 07 1.75 - 1.99 08 2.00 - 2.49 09 2.50 - 2.99 10 3.00 - 3.49 11 3.50 - 3.99 12 4.00 - 4.49 13 4.50 - 4.99 14 5.00 and over 15 Less than 1.00 (no further detail) 16 1.00 - 1.99 (no further detail) 17 2.00 - 3.99 (no further detail) 18 4.00 and over (no further detail) 96 Undefinable 99 Unknown	1-3, 15 = < 100% FPL 4-7, 16 = 100 - 200% 8-14, 17-18 = >200

Responses with “unknown,” “not ascertained,” “refused,” and “don’t know” values were not included in data analyses; HS (high school).

Table A-1: 2013 to 2015 Data Dictionary (Continued) (Source NHIS)

<i>Variable</i>	<i>Original Name</i>	<i>Renamed</i>	<i>Value</i>	<i>Recoded Value</i>
Enabling Factors (Person and Family files)	EDUC1	Education Completed	00 = Never/Kinder only; 1 = 1st grade; 2 = 2nd grade; 3 = 3rd grade; 4 = 4th grade; 5 = 5th grade; 6 = 6th grade; 7 = 7th grade; 8 = 8th grade; 9 = 9th grade; 10 = 10th grade; 11 = 11th grade; 12 = 12th grade, no diploma; 13 = GED or equivalent; 14 = High School Graduate; 15 = Some college, no degree; 16 = Associate degree: occupational, technical, or vocational program; 17 = Associate degree: academic program; 18 = Bachelor's degree (Example: BA, AB, BS, BBA); 19 = Master's degree (Example: MA, MS, MEng, MEd, MBA); 20 = Professional School degree (Example: MD, DDS, DVM, JD; 21 = Doctoral degree (Example: PhD, EdD); 96 = Child under 5 years old; 97 = Refused; 98 = Not ascertained; 99 = Don't know	Grade 0 – 12 = 1 (less than HS) Grade 13 – 14 (HS/GED) Grade 15 – 21 (College) Removed 96 - 99
	HIKINDNK	No Insurance	1 = Mentioned 2 = Not mentioned 7 = Refused 8 = Not ascertained 9 = Don't know	2 = 1 (Yes) 1 = 0 (No) Removed 7, 8 , & 9

Responses with “unknown,” “not ascertained,” “refused,” and “don’t know” values were not included in data analyses; HS (high school).

Table A-1: 2013 to 2015 Data Dictionary (Continued) (Source NHIS)

<i>Variable</i>	<i>Original Name</i>	<i>Renamed</i>	<i>Value</i>	<i>Recoded Value</i>
Predisposing Factors (Person File)	WRKLYR	Employment	1 = Yes; 2 = No; 7 = Refused; 8 = Not ascertained; 9 = Don't know	1 = Yes 0 = No
	AGE_P	Age Grouping	00 = Under 1 year; 01-84 = 1-84 years; 85 = 85+ years	00 - 34 = 1; 35 - 54 = 2; 55 - 64 = 3; ≥ 65 yrs = 4
	Sex	Gender	Male = 1; Female = 2	Male = 1; Female = 2
	R_MARITL	Marital Status	0 = Under 14 years; 1= Married - spouse in household; 2= Married - spouse not in household; 3= Married - spouse in household unknown; 4= Widowed; 5 = Divorced; 6= Separated; 7= Never married; 8= Living with partner; 9= Unknown	0 (under 14) not eligible for analysis (does not meet inclusion criteria). 1 , 2 & 3 = 1 Married/Partnered); 4, 5 , 6, 7 & 8 = 2 (not married/partnered (Removed 9 - unknown
	REGIONBR	Region of Origin	01= United States; 02 = Mexico, Central America, Caribbean Islands; 03 = South America; 04 = Europe; 05 = Russia (and former USSR areas); 06 = Africa; 07 = Middle East; 08 = Indian Subcontinent; 09 = Asia; 10 = SE Asia; 11 = Elsewhere; 99 = Unknown. Note: Recoded based on the WHO definitions	1, 2, & 3 = 1 (Americas) 4 - 5 = 2 (Europe) 6 = 3 (Africa) 7 = 4 (Eastern Mediterranean) 8, 9, & 10 = 5 (SE Asia) 11 = 6 (Elsewhere) LATER RECODED 5 = 4; 4 AND 6 = 5 for Logistic Regression modeling
	RACERPI2	Race	OMB groups w/multiple race 01 = White only; 02 = Black/African American only; 03 = AIAN only; 04 = Asian only; 05 = Race group not releasable* 06 = Multiple race Note: Recoded values based on the new U.S office of Management and Budget (OMB) standards (NHIS, 2017)	1 = White 2 = Black/African American 3 = American Indian or Alaska Native (AIAN) 4 = Asian 6 = 5 (Multiple); LATER RECODED INTO SAME VARIABLE 4 = 3 AND 3 & 5 = 4

Responses with “unknown,” “not ascertained,” “refused,” and “don’t know” values were not included in data analyses; HS (high school).

Table A-1: 2013 to 2015 Data Dictionary (Continued) (Source NHIS)

<i>Variable</i>	<i>Original Name</i>	<i>Renamed</i>	<i>Value</i>	<i>Recoded Value</i>
Nee Factors (Person File)	LA1AR	Functional Limitation	1 = Limited in any way; 2 = Not limited in any way; 3 = Unknown if limited	1 = Yes 0 = No
	Chronic Illness	Chronic Illness	HTN, Dyslipidemia, DM, Asthma, Stroke, Heart Disease: 1 = Yes; 2 = No; 7 = Refused; 8 = Not ascertained; 9 = Don't know	1 = Yes 0 = No
	PHSTAT	Self-Rated Perception of Health	1 = Excellent; 2 = Very good; 3 = Good 4 = Fair; 5 = Poor; 7 = Refused 8 = Not ascertained; 9 = Don't know	1 = Excellent; 2 = Very good; 3 = Good; 4 & 5 = 4 (Poor/Fair)

Responses with “unknown,” “not ascertained,” “refused,” and “don’t know” values were not included in data analyses; HS (high school).

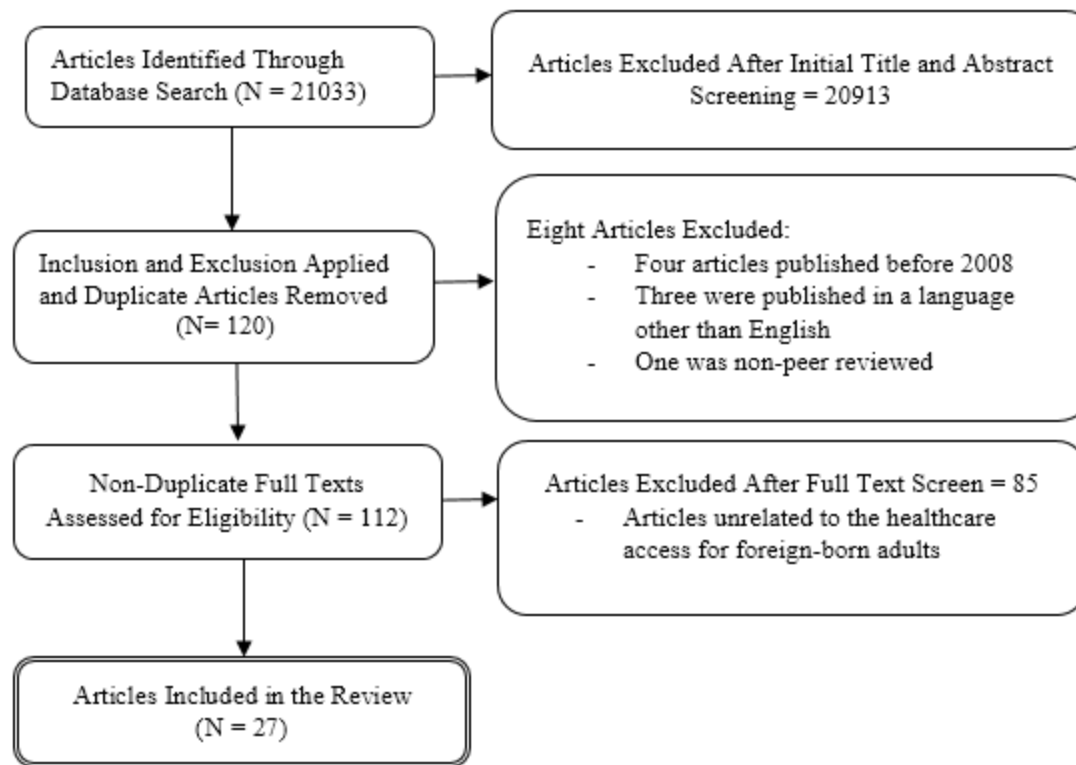


Figure A-3: Eligibility Criteria and Search Strategy

Table A-2: Summary of Articles Reviewed in Current Study

<i>Characteristics</i>	<i>Author/Date</i>	<i>Data Source</i>	<i>Sample</i>	<i>Dependent Variable</i>	<i>Pertinent Findings</i>
Predisposing Factors					
Age	Chung et al. (2017)	Qualitative analysis of focus groups and interviews	Seventeen community-dwelling older Korean-Americans ≥ 65 years in Seattle, WA.	Health-seeking behaviors	Multiple factors contribute to reasons older foreign-born persons experience disparities in access to and utilization of health care.
Insurance Gender	Gonzales, Dedania, & Driscoll (2018)	National Health Interview Survey (NHIS) 2013- 2016	Age 18-64; US-born heterosexuals; foreign-born heterosexuals and sexual minorities	Dimensions of immigration status and sexual orientation by the uninsured were compared.	No significant difference in possession of insurance, having a usual source of care, and a recent doctors' visit by sexual orientation for native-born and foreign-born adults.
Region of Origin Gender	Ye et al. (2012)	NHIS 2003- 2005	Adult 18 to 64; Self-identified as Asian	Access indicators: health insurance, routine & sick care access. Healthcare utilization indicators: ED and physician visits	Overall, foreign-born Asians have less adequate access to formal medical services compared to U.S.-born Asians. Immigration status as reflected by country of birth may affect the use of health care among Asian Americans.
Age Race/ Ethnicity	Du & Xu (2016)	California Health Interview Survey (CHIS) 2011-2012	Adults 65+	Delayed medical care and delayed prescription	Findings from the study confirmed the existence of health disparities, based on racial/ ethnic backgrounds and immigration.

Table A-2: Summary of Articles Reviewed in Current Study (Continued)

<i>Characteristics</i>	<i>Author/Date</i>	<i>Data Source</i>	<i>Sample</i>	<i>Dependent Variable</i>	<i>Pertinent Findings</i>
• Race/ Ethnicity	Massey et al. (2017)	Health Information National Trends Survey	Adults aged 18+	Health information seeking and the first source of health information	Foreign-born nativity and language preference are significant determinants of health information seeking.
• Region of Origin • Insurance	Reyes & Hardy (2015)	Survey of Income and Program Participation data (2004 and 2008 panels)	Foreign-born adults (aged 50–64) from Asia, Latin America, and Europe	Possession of health insurance coverage; monthly reports of health insurance coverage for each respondent	After controlling for income levels, education level, and job status; there were significant coverage discrepancies between the native-born and foreign- born adults, regardless of region of origin.
• Age	Holmes, Driscoll & Heron (2015)	NHIS (restricted- use data) 1997–2009	Foreign-born and U.S.-born Hispanics ages 25+.	Mortality	Age at immigration was a significant predictor of mortality than the duration of stay in the U.S.
Need Factors					
• Unmet Health Care Needs	Pandey, Cantor & Lloyd (2014)	New Jersey Family Health Survey 2009	7,336 individuals from 2,100 families in New Jersey	Perceived unmet health care needs and whether the individual had seen a physician during the last year	Before main provisions of ACA coverage expansions were implemented; Foreign-born in New Jersey reported lower levels of unmet health care needs compared with native-born residents.
• Health Services Utilization by Citizenship Status	Tarraf, Vega, & González (2014)	Medical Expenditures Panel Survey 2004 - 2008	Noninstitutionalized U.S. adults 18+	Emergency department services utilization in the previous year	Foreign-born non- citizen adults were less likely to utilize the emergency department services compared with their native-born and naturalized citizen counterparts.

Table A-2: Summary of Articles Reviewed in Current Study (Continued)

<i>Characteristics</i>	<i>Author/Date</i>	<i>Data Source</i>	<i>Sample</i>	<i>Dependent Variable</i>	<i>Pertinent Findings</i>
• Perception of Health • Chronic Conditions	Mehrotra, Gaur, & Petrova (2012)	Survey/questionnaire	foreign-born Asian Indians adults aged 18+	Self-reported health perception, routine health exams, and measures of satisfaction with care	Most participants reported the presence of chronic conditions, yet underutilized preventive screenings; poorer self-rated health perception among Asian-Indians with chronic health conditions.
• Perception of Health	Howe et al. (2016)	Survey of Income and Program Participation (2004 and 2008 panels)	Foreign-born adults (19 and older) of Hispanic and Asian origin	Perceived health needs and regular visit to the doctor	Hispanic adults had lower perceptions of medical needs being met and were less likely to see a doctor regularly. Compared with Asian-Americans, Hispanic-Americans were less likely to be insured.
• Perception of health	Lee & Choi (2009)	CHIS 2005	Adult native-born citizens, naturalized citizens, and non-citizens (ages 18-64)	Usual source of care	No difference was found between the perception of health status and having a usual source of care among native-born and naturalized adult citizens.
• Unmet health care needs	Siddiqi, Zuberi, & Nguyen. (2009).	Joint Canada/U.S. Survey of Health 2002/2003	American and Canadian household residents aged 18+	Self-rated unmet medical needs and lacking a regular doctor	Foreign-born adults in the U.S. were more likely to lack a regular doctor than their native-born counterparts.
Enabling Resources					
• Duration of U.S. Residency	Choi, 2012	Second Longitudinal Survey of Aging	Older adults aged 70+	Convergence of health status by the duration of U.S. residency	Mortality was lower among foreign-born with less than 15 years residence in the U.S; the results partially supported the ‘healthy immigrant effects’ among older adults.
• Health Literacy • English Language Proficiency	Sentell & Braun (2012)	CHIS 2007	Adults aged 18+	Health literacy	Adults with low health literacy and language barrier are at higher risk for poor health compared with those with higher health literacy and English language proficiency.

Table A-2: Summary of Articles Reviewed in Current Study (Continued)

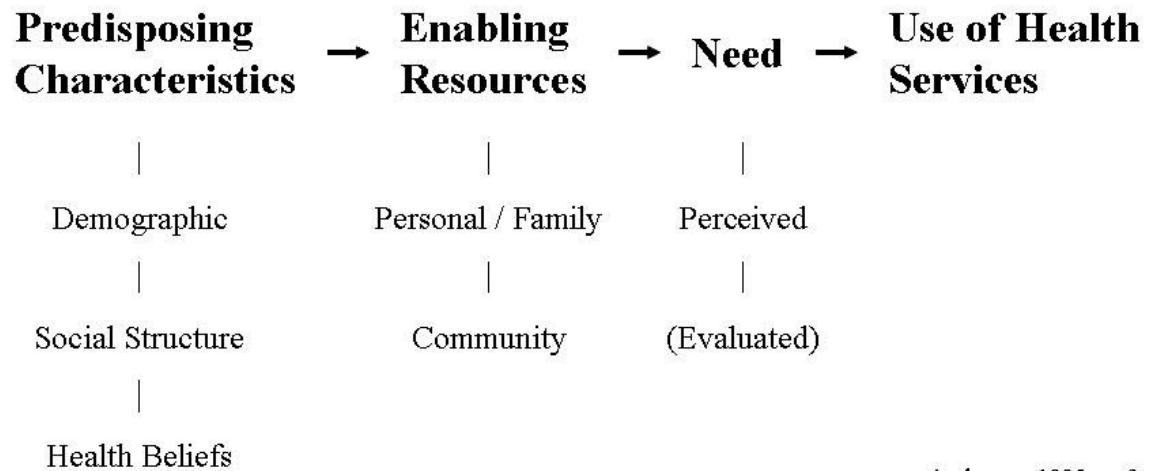
<i>Characteristics</i>	<i>Author/Date</i>	<i>Data Source</i>	<i>Sample</i>	<i>Dependent Variable</i>	<i>Pertinent Findings</i>
Insurance	Alcala et al. (2016)	CHIS 2009	Adults aged 18+	Having a usual source of care and insurance coverage status	Uninsured and foreign-born individuals were differentially affected by lack of access to and utilization of health care
Health Literacy	Khuu, Lee & Zhou (2017)	Interviews and Survey	Hmong - American adults	Health literacy	Foreign-born Hmong adults with limited health literacy had relatively worse health status, underutilize preventative services, and had less ability to manage their health.
Insurance	Wilper et al. (2009)	3rd National Health & Nutrition Examination Survey	Adults 17 to 64 years old	Mortality	Uninsured adults had higher mortality rates and are more likely to forgo needed care than adults with private insurance.
Insurance English Language Proficiency Perception of Health	Rodriguez, Bustamante, & Ang (2009)	Pew Hispanic Center/Robert Wood Johnson Foundation, 2007	Telephone survey of 4,013 Latino adults	Usual source of care, insurance coverage, and patient-provider language concordance	Usual source of healthcare is a significant predictor in determining whether adults receive recommended screening and preventive services
Region of Origin Gender	Lebrun & Dubay (2010)	Joint Canada-United States Survey of Health 2002 to 2003	330 foreign-born sexual minorities	Potential Access: having a regular medical doctor; Realized access (healthcare utilization)	Foreign-born in the U.S. were less likely to have a regular doctor and an annual consultation with a doctor, compared with native-born

Table A-2: Summary of Articles Reviewed in Current Study (Continued)

<i>Characteristics</i>	<i>Author/Date</i>	<i>Data Source</i>	<i>Sample</i>	<i>Dependent Variable</i>	<i>Pertinent Findings</i>
• Duration of U.S. Residency • English language Proficiency	Chi & Handcock (2014)	CHIS 2009	Foreign-born adults	Usual source of healthcare; delay in prescription, delay in healthcare, the doctor visit during the previous year	Foreign-born adults with longer duration of residence in the U.S but with limited English language proficiency may be less likely to have a usual source of care; more likely to report delays in obtaining medical care, than even newly arrived foreign-born adults with limited language proficiency.
• Insurance • English Language Proficiency • Immigration Status	Liebert & Ameringer (2013)	Interviews (content analysis)	Uninsured Hispanics in the Greater Richmond area	Purpose of study: where uninsured foreign-born individuals turn for care & why; type of medical care received, and healthcare access barriers	Example of factors influencing health care access barriers for foreign-born Hispanic persons: language barriers, financial difficulties, immigration status challenges, lack of information about the health system navigation and transportation issues.
• Citizenship Status • Insurance • Region of Birth	Derosé et al. (2009)	A systematic review of the literature	67 out of 1,559 articles reviewed	Not applicable	Review: noncitizens were more likely to be uninsured, lack a regular source of care and underutilize health services, compared to their native-born counterparts.

Table A-2: Summary of Articles Reviewed in Current Study (Continued)

<i>Characteristics</i>	<i>Author/Date</i>	<i>Data Source</i>	<i>Sample</i>	<i>Dependent Variable</i>	<i>Pertinent Findings</i>
• U.S Region	Carreon & Baumeister (2015)	National Longitudinal Study of Adolescent Health	Seven subgroups of Asia: Indians, Chinese, Filipinos, Japanese, Koreans, Vietnamese, and other Asians.	Routine Annual follow-up care Neighborhood segregation	Significant disparities among foreign-born subpopulation in routine preventative follow-up based on neighborhood segregation.
• Health Services Utilization by Immigration Status	Bustamante et al. (2012)	CHIS 2007	Documented and undocumented foreign-born adult Hispanics/Latino	Usual source of care, delay in healthcare and prescription drug	Undocumented Hispanic adults were less likely to have a usual source of care/doctor visit in the previous year compared to lawfully-present Hispanic-Americans.
• Immigration Status • Region of Birth	Bustamante et al. (2014)	CHIS 2009	Adult non-institutionalized Californians	Likelihood of health insurance coverage and the key reasons for being uninsured	Immigration status is the primary driver of the ability to obtain and afford health insurance.
• Insurance • Duration of U.S. Residency	Lee et al. (2012)	National Immigrant Survey	Adults with legal permanent residency May-Nov. 2003	Length of U.S. residency and health status	Foreign-born adults with insurance were twice as likely than their uninsured counterparts to utilize preventative health screening services



Andersen, 1995, p. 2

Figure A-4: Original Andersen's Model



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VITA

Shade Adigun earned her first nursing credential with distinction, from ECWA School of Nursing in Nigeria. She became certified as a Nurse Midwife after graduating from Bowen University Teaching Hospital School of Nursing and Midwifery. She received her Bachelor of Science from Bryan College, Dayton TN. She then attended Liberty University, Lynchburg VA for her Master of Science in Nursing degree with certification in Critical-Care Clinical Nurse Specialist in 2012. In 2013, she completed a Post-Master's program from Tennessee State University, Nashville TN with certification as a Family Nurse Practitioner. She is currently nationally certified as an Advanced Practice Registered Nurse with the American Nurses Credentialing Center and the American Association of Critical Care Nurses. After certification as a nurse practitioner, Shade specialized in inpatient and outpatient acute and chronic illness management in cardiology, electrophysiology, and internal medicine specialty practices. With 18 years of professional nursing practice, her multiple roles as a clinician, researcher, consultant, and program coordinator have placed her in strategic positions to witness firsthand the contemporary health care access challenges faced by various patient groups. The experience informed her interest in examining health care access for the underserved population, specifically, among foreign-born adults in the U.S. On the national level, she served as Liaison for The University of Tennessee College of Nursing with the Graduate Nursing Student Academy and American Association of Colleges of Nursing from 2016 to 2019. Shade has mentored multiple undergraduate and graduate nursing students as well as new graduate nursing students on local, national, and international levels. She graduated from The University of Tennessee, Knoxville in May 2019 with her doctorate.