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Disparities in Cervical Cancer Screening Among Latinas in California:

Does Birthplace Matter as a Barrier to Care?

by

Geri L. Schmotzer

DISSERTATION

Submitted in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

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Nursing

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GRADUATE DIVISION

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By  
Geri L. Schmotzer

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## ABSTRACT

The purpose of the descriptive cross-sectional study is to examine the factors that enable or impede cervical cancer screening among Latinas in California. This study applied a well-known theoretical framework for health service usage, the Behavioral Model for Vulnerable Populations, to examine correlates of Pap testing practices among Latinas who were native-born, recently immigrated or established immigrants.

Data from the combined 2001, 2003, and 2005 California Health Interview Survey (CHIS) for self-identified Latinas was explored to determine Pap testing practices and rates. Weighted data for 13,889 Latinas were analyzed using multivariate logistic regression models to assess factors that facilitated or presented barriers to Pap testing.

This study determined there was an overall decline of 3% by Latinas reporting a Pap test in their lifetime. Latinas who had health insurance, food insecurity, and/or quit smoking were more likely to have received a Pap test in their lifetime. Time since immigration, age, education, marital status, family type, and time since the last physician visit were variables that contributed the least to ever having a Pap test for Latinas in California.

The theoretical model used for this study, with its emphasis on economic as well as social and psychological factors, appears to fit the data well and addresses the relevant explanatory factors. This study found that among the three groups: U.S.-born, recent immigrants, and established immigrants, lifetime use of Pap testing was lowest among the recently immigrated Latinas, controlling for other known factors associated with screening. This finding demonstrates the importance of targeting recent Latina immigrants to increase the use of cervical cancer screening. However, the declining trend

for both native Latinas and established immigrants in Pap testing rates suggests a need for health professionals to target all Latinas, regardless of immigration status, to increase the rate of Pap testing among this vulnerable group.

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## CHAPTER ONE: THE STUDY PROBLEM

### Introduction to Problem

The United States (U.S.) is a land of opportunity that has grown and prospered through the toil and determination of its immigrant populations. Its founders were immigrants; and their descendants make up its population today. In recent times Hispanic migrants cross the U.S. southern border from Mexico, Latin America, South America, and the Caribbean looking for a better life (Zuckerman, 2005, p. 417).

Latinos are the nation's largest immigrant population. In 2005, they constituted 14% of the nation's population and are expected to grow from births and immigration to 29% by 2050 (Pew Hispanic Center, 2008). In 2006 of the foreign-born people in the United States, 47.8% reported Hispanic or Latino origins (Migration Policy Institute, 2008). Of the 30.1 million Hispanic adults in the United States, 48% or 14.4 million are women (Gonzales, 2008). Of these women, 52% are foreign-born<sup>1</sup> and the remainder are native Hispanics (Migration Policy Institute, 2008).

#### *Cervical Cancer in Latin American*

A recent report by the Pan American Health Organization (2008) estimates that over 30,000 women in Latin America die each year from cervical cancer. Women living in Mexico, Latin America, and South America have approximately three times the incidence and mortality rates of cervical cancer than women who reside in the U.S. In Mexico, because of the late diagnosis, cervical cancer is the leading cause of cancer

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<sup>1</sup> The Migration Policy Institute (2008) defines foreign-born as those people residing in the U.S. who were not U.S. citizens at birth. The foreign-born population includes naturalized citizens, lawful permanent immigrants, legal nonimmigrants (those on work, student or temporary visas), and persons residing in the U.S. without authorization. The term *native* refers to people born in one of the 50 United States or the District of Columbia, one of the U.S. territories, or those born aboard to at least one U.S. citizen parent.

deaths (Wall, Nunez-Rocha, Salinas-Martinez, & Sanchez-Pena, 2008). While Mexico, Latin America, and the Caribbean have had screening programs for more than 20 years, there has been little impact on cervical cancer either on incidence or mortality rates (PAHO-2004). If this trend continues, the number of estimated deaths from cervical cancer will double by 2030 (PAHO- press release- 2008).

When screening of asymptomatic women is available, cervical cancer is fully preventable and curable at low cost and low risk with appropriate diagnosis, treatment, and follow-up. However, prevention, screening and early detection programs in Latin America and the Caribbean have met with limited or no success (Kamangar, Dores, & Anderson, 2006; Parkin, Bray, Ferlay, & Pisani, 2005). While the annual rates of cervical cancer remain high, most countries of Latin America and the Caribbean experience rates greater than 20 cases per 100,000 females.

#### *Cervical Cancer in the US*

Cancer is leading cause of death in the United States, second only to cardiovascular disease. Yet, over the last several decades, declines in cervical cancer incidence have resulted in significantly lowered rates to less than 10 cases per 100,000 females in the U.S. and other established market economies (PAHO, 2004). According to the Center for Disease Control (2006) cervical cancer incidence and mortality rates have decreased significantly over the last forty years in the U.S. Among Hispanic women there was a 4.2% yearly decrease between 1996 and 2005. The mortality rates experienced a 3.1% yearly decline during the same period. Yet, the 2006 estimate for the leading site of new cancer cases and deaths among the nations Hispanic women was cervical cancer (Centers for Disease Control and Prevention, 2008b). Among Hispanic women the

incidence rate of cervical cancer is 1.8 times higher than for non-Hispanic whites (Carozza & Howe, 2006; Howe et al., 2006). For Hispanic women the death rate from cervical cancer is 50% higher than for non-Hispanic white women (American Cancer Society, 2008b).

Hispanic women are less likely than non-Hispanic white women to participate in cervical cancer prevention screenings. In a study conducted by Goel et al. (2003) it was reported that foreign-born Latinas have lower cervical cancer screening rates than non-Hispanic whites. Little is known if differences exist in the cancer screening practices of Hispanic subgroups (Scarinci, Beech, Kovach, & Bailey, 2003). However in one study, Rodriguez, Ward, & Perez-Stable (2005) reported foreign-born Latinas had lower screening rates than both native Hispanics and non-Hispanic whites. Since cancer screening facilitates early detection, early treatment can be started. Treatment started early is more effective and can greatly improve the chances of cure. It has been estimated that approximately 80% of deaths from cervical cancer could be prevented through early detection and subsequent treatment (American Cancer Society, 2008b). However, there are many reasons for low screening rates in both Latin American and the United States among Latinas. These include: lack of health insurance and access to care, low socioeconomic status, lack of knowledge and types of health beliefs, and cultural barriers (Ackerson & Gretebeck, 2007; Austin, Ahmad, McNally, & Stewart, 2002; Mayo, Erwin, & Spitler, 2003; Rodriguez et al., 2005).

## Statement of the Problem

Latinas who migrate to the U.S. bring with them their own knowledge and experiences about cancer and cancer screening. They fall between two worlds, the one they have recently joined, and the one they left behind. Although overall cervical cancer screening rates are increasing in the U.S., under utilization among Latinas is still a major concern. Immigrant Latinas still face multiple barriers that discourage or prohibit them from obtaining screening tests (M. A. Fernandez, Tortolero-Luna, & Gold, 1998). Characteristics of barriers to cancer screening are multifaceted and are influenced by economic, social, and cultural factors. Immigrant Latinas are often poorer, have less education, and lower English language proficiency than non-Hispanic, whites or even U.S.-born Hispanics (Gonzales, 2008). They face multiple financial, structural, and personal barriers to receiving health care. They are less likely to have health insurance or a usual source of health care, they lack transportation to and from providers, and often need assistance with childcare in order to obtain health care (Goel et al., 2003). In addition, cultural behaviors and beliefs present additional barriers to screening. Beliefs about the causes of cancer and its treatment; knowledge and misconceptions about cancer, the signs and symptoms and screening guidelines; and concerns over diagnosis and testing all influence Latinas' cancer screening practices (Buki, Borrayo, Feigal, & Carrillo, 2004). Thus, when compared to native-born Latinas who are second generation or more, immigrant Latinas in the U.S. may experience an unequal burden of cervical cancer and face a multitude of barriers to early screening (Rodriguez et al., 2005). Additionally, recent immigrants may be more at risk due to the knowledge, beliefs, and



behaviors regarding the use of health services they bring with them from their home countries.

#### Purpose of the Study

The purpose of this study is to examine the trend in cervical cancer screening and the relationship between the receipt of cervical cancer screening and the financial, structural, and personal factors that create barriers to screening among native and foreign-born Latinas who reside in California.

#### *Significance*

As the fastest growing segment of the United States population, Latinas may experience multiple barriers to cervical cancer screening. Having a better understanding of immigrant Latinas and whether they are less likely to be screened as compared to native Latinas is a first step to providing insight into ways to increase screening among immigrant Latinas. This work can lead to further research in determining factors that create barriers to cancer screening among immigrant women in this country, especially those who have newly arrived and who are not acculturated to this society's practices. Moreover, in order to provide culturally sensitive and relevant health care, a better understanding of barriers faced by immigrant Latinas can provide insight into ways to promote cancer prevention among these women.

## CHAPTER TWO

### Literature Review and Conceptual Framework

#### *Theoretical framework: The Behavioral Model for Vulnerable Populations*

##### *Theory Overview.*

The Behavioral Model for Vulnerable Populations (2000) is an adaptation of the Behavioral Model (BM) developed by Andersen (1995) to explain the use of health services among families. Andersen (1995, p. 1) states the model “suggests that people’s use of health services is a function of their predisposition to use services, factors which enable or impede use, and their need for care”. The original model was revised to include domains applicable to understanding the health and health behaviors of vulnerable populations and is now called The Behavioral Model for Vulnerable Populations (BMVP) (Gelberg et al., 2000). This model conceptualizes health care utilization as the end result of a complex pattern of interplay among predisposing, enabling, and need-for-care characteristics. It is based on the assumptions that 1) vulnerable populations face additional barriers to health services, therefore, group-specific relevant variables must be included in each domain to tailor the model to the particular conditions of the group and 2) health status is both an outcome, as well as a determinant, of use which includes patient satisfaction and compliance (Gelberg et al., 2000, p. 1276). Since Aday (1994) defines a vulnerable population as one at risk of having poor physical, psychological, or social health and includes such groups as low-income people, women, minorities, and immigrants, Latina immigrants are identified as a vulnerable population. To better understand what factors influence Latina immigrants to participation in cervical cancer screening, the BMVP model is being used as a guide for this research.

### *Constructs*

The main constructs of this model are predisposing, enabling, and need factors. Each construct has two components: traditional domains and vulnerable domains. *Predisposing factors* predict the propensity of an individual to use health services, *enabling factors* enable or impede use of health care services, and *need characteristics* include objective and subjective assessment of health status (Owusu et al., 2005). The vulnerable domain was added to the model to expand its use in studying vulnerable populations, and focuses on social structure and enabling resources (Gelberg et al., 2000). Each construct is further defined below and incorporates both traditional and vulnerable domains. Figure 2 shows the Behavioral Model for Vulnerable Populations adapted for this research.

#### *Predisposing*

Predisposing characteristics exist prior to the onset of illness and include those characteristics that describe the propensity of individuals to use health services. Predisposing factors provide the motivation or rationale for health behaviors and are antecedents to screening behaviors. This includes the individual's personal knowledge, beliefs, and attitudes that impede or enable the use of health services (Glanz & Rimer, 2005, p. 417). The predisposing, vulnerable construct includes demographic characteristics, social structural characteristics, childhood characteristics, living conditions, psychological resources, and health beliefs. This construct includes such factors as age, gender, race and ethnicity, level of education, marital status, family composition, and language (Bazargan, Bazargan, Farooq, & Baker, 2004). Among Latinas, demographic differences, age and marital/cohabitation status in particular,

contributed significantly toward explaining the use of cancer screening services. Older women in particular were less likely to be screened. The level of education obtained also contributes to the use of health services with those having lower levels of education using services less (Coronado, Thompson, Koepsell, Schwartz, & McLerran, 2004). In addition, English language proficiency is associated with a lower likelihood of having a screening exam even after controlling for age and educational differences (L. E. Fernandez & Morales, 2007).

### *Enabling*

Enabling factors refers to the individual's ability to use health services. The enabling vulnerable construct includes individual characteristics such as having a regular source of care, income and health insurance coverage, as well as structural components, such as the affordability and availability of health services in their geographic area, competing needs, and use of information sources (Bazargan et al., 2004; Owusu et al., 2005). Researchers report enabling factors explain a significant proportion of the variation in use of cancer screening services (L. E. Fernandez & Morales, 2007). In particular, having a regular health care provider, along with health insurance have the most influence (Coughlin, Leadbetter, Richards, & Sabatino, 2008; Gorin & Heck, 2005). Women who have a regular health care provider are more likely to access the health system and obtain screening services. Another factor, low income, is associated with a lower likelihood of having timely cancer screenings. Women who said that cost prevented them from accessing health care in the past year were significantly less likely to have timely Pap smears (L. E. Fernandez & Morales, 2007).

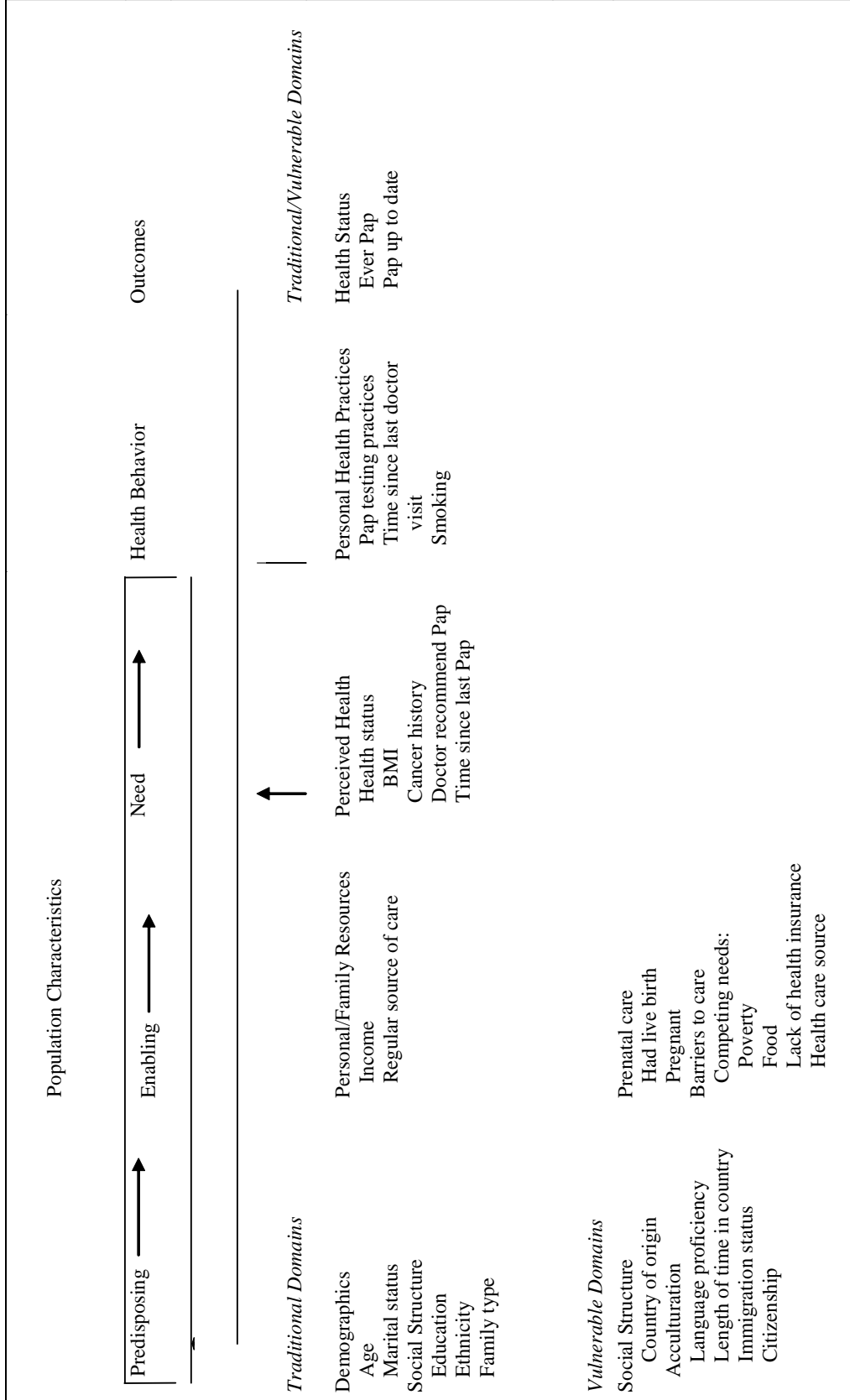
### *Need-For-Service*

Need-for-service characteristics include objective and subjective assessments of health status. To use health services the individual must perceive some need for preventive care (L. E. Fernandez & Morales, 2007). They are the immediate cause of the utilization of health services and involve both perceived and evaluated health status. Measures of perceived illness include symptoms an individual may experience, self-reported health status, or complications or side effects of medical conditions. The evaluated health measure is the actual health problem an individual experiences. (Bazargan et al., 2004). In a study conducted by Gorin & Heck (2005) need-related factors emerged as strong predictors of cancer screenings. Individuals who participated in one cancer screening were more likely to participate in multiple screenings. This may be due to these individuals being more health conscious or more knowledgeable about cancer and screening test. Conversely, it is suggested by a review by Hiatt, Klabunde, Breen, Swan, & Ballard-Barbash (2002) that this factor has received less attention than others and further study of the predictive importance of health status in Latinas is warranted.

### *Health Behaviors*

The health behaviors construct includes the personal health practices of the individual. Measures of this construct would include Pap testing practices, smoking status, and length of time since the last doctor visit.

Figure 1.1. The Behavioral Model for Vulnerable Populations



Adapted from Gelberg, Andersen, & Leake (2000)

This model's value for understanding the health service use for vulnerable populations suggest it would be feasible in a wide variety of contexts for understanding health service utilization in vulnerable populations. The theoretical model, with explicit attention to economic as well as social and psychological factors, appears to address the relevant explanatory factors. Applying models of health service utilization to vulnerable groups appears to be especially helpful in identifying the challenges these groups face in obtaining needed services and may provide insight into maintaining or improving their health status. The BMVP is a good model to predict health service utilization. It is multifactorial which integrates a range of individual, environmental, and provider-related variables associated with decisions to seek health care. There are many factors other than health beliefs that present barriers to cancer screening immigrant Latinas. The BMVP evaluates the social and psychological components of health behavior and it also takes into consideration external factors such as provider recommendation and referral to screening, personal, and family resources, and current health status. Since seeking preventive health measures such as cervical cancer screening is a complex interaction of internal and external parameters, the interaction of components of the BMVP helps to explain barriers to the utilization of the health care system. It is a valuable model to understand health behavior and health service usage and to comprehend improvement in the health status of vulnerable groups. It provides a good framework for the study of the personal and structural barriers that prohibit Latinas from obtaining cancer screenings.

### Definition of Terms

The terms “Hispanic” and “Latina” are used interchangeably in this paper and reflect both the popular use of the terms and the Office of Management and Budget’s (OMB) terminology standards in effect for Census 2000. Hispanic is the term used by the U.S. government in national reporting to designate persons of Spanish, Mexican, Central American, South American, Cuban, or Puerto Rican descent (U. S. Census Bureau, 2000). The term ‘Latina’ is a self-designated term of ethnicity considered by some social scientists as more ethnically and culturally appropriate and is used to refer to females from Mexico, Central America, and South America (Mayo et al., 2003).

*Acculturation:* Nativity status and length of time residing in the U.S. are used in the current literature as proxy measures of acculturation. In this report acculturation will also be defined by these same two measures (A. F. Abraido-Lanza, Chao, & Gates, 2005). Native-born Latinas are defined as those who were born in the U.S. Recent immigrants are defined those who lived < 5 years in the US, and established immigrants are defined as those who lived  $\geq 5$  years in the US.

### Guidelines for Cervical Cancer Screening

The American Cancer Society states women should begin cervical cancer screening about 3 years after they begin having vaginal intercourse, but no later than when they are 21 years old. Beginning at age 30 women who have had normal Pap test results three years in a row need only be screened every 2 to 3 years. Women 70 years of age, or older, who have had 3 or more normal Pap tests in a row and no abnormal Pap test results in the last 10 years may choose to stop having cervical cancer screening. Women who have had a total hysterectomy (removal of the uterus and cervix) may also choose to



stop having cervical cancer screening, unless the surgery was done as a treatment for cervical cancer or pre-cancer (American Cancer Society, 2008a)

The target for Healthy People 2010 is to increase the rate of cervical cancer screening to 97% for women aged 18 and older who have ever received a Pap test and to increase the rate to 90% for women aged 18 and older who received a Pap test in the preceding 3 years (California Department of Public Health, 2007).

#### Literature Review Examining Cervical Cancer Screening Practices of Latinas

The contribution of the predisposing, enabling, need, and health behavior factors of the cervical cancer screening practices of Latinas is the focus for this review. In order to ascertain the state of the current research, the remaining section of this chapter will explore the literature and research regarding the role of the predisposing, enabling, need, and health behavior factors that presents barriers to cervical cancer screening by Latinas.

#### *Predisposing Factors*

There were several studies that explored the impact of predisposing factors on the cancer screening practice of Latinas. A woman's age was significantly associated with Pap testing, with the youngest and the oldest having the most effect. Four studies investigated age in relation to Pap testing. Buki, Jamison, Anderson, & Cuadra (2007) conducted a study to determine the factors that influence screening behaviors of uninsured Latinas in four U.S. cities. Four hundred twenty-seven women completed a questionnaire. Logistic regression was used to model Latinas' adherence to screening recommendations for cervical cancer. The authors found younger Latinas more likely (OR=1.47, CI= 1.08-20.1) to have obtained a Pap test. Owusu, (2005) conducted a telephone survey with a random sample with 2034 low-income minority and immigrant

women to examine the use of Pap testing who were patients in a safety-net health care system. Pap test screening predictors were analyzed using binary logistic regression. Findings concluded that younger women were the most likely to have received a Pap test in the past year while older women were most likely to have ever been screened. In contrast, Bryd, Peterson, Chavez, & Heckert (2004) surveyed young Hispanic women 18 to 25 years old in El Paso, TX to examine the beliefs, attitudes, and personal characteristics that correlated with self-reported cervical cancer screening. One hundred eighty-nine Latinas participated in a face-to-face survey. Bivariate relationships between Pap testing history, sociodemographic, and health belief covariates were examined. These researchers found suboptimal rates (69%) of screening for cervical cancer among the young Latinas. Coughlin, Uhler, Richards, & Wilson (2003) analyzed data from the Behavioral Risk Factor Surveillance System survey of adults  $\geq 18$  conducted in 1999 and 2000. The study examined the cervical cancer screening practices of Hispanic and non-Hispanic women in counties that approximate the U.S. southern border region. A multivariate analysis determined women over 65 years of age were the least likely to have had a Pap test. Thus, there is conflicting information regarding the youngest and the oldest ages in cancer screening and none that have included nativity as a factor. Therefore more research is needed that address these factors in Pap testing practices.

The effect of the level of education obtainment on Pap testing rates was discussed in five studies. Higher education was associated with an increased odds of Pap testing . Lazcano-Ponce et al. (1997) conducted a cross-sectional study in two regions of Mexico, Oaxaca, a rural area and Mexico City, an urban area. The authors looked to determine the main factors for predicting participation in cervical cancer screening programs. Four

thousand two hundred and eight women aged 15 to 49 were surveyed in 1994. In both regions as education increased, the probability of Pap testing increased (Mexico City: OR=3.6, CI=1.5-8.8; Oaxaca: OR=5.3, CI=2.8-10.0). In addition, an analysis using data from the 1991 National Health Interview Survey, researchers found after adjusting for sociodemographic factors that higher education was associated with greater odds of having received a recent Pap test (OR=1.18) (A. F. Abraido-Lanza et al., 2005). In the study conducted by Buki et al. (2007) additional findings concluded young women with higher levels of education were more likely to have received a Pap test (OR=1.94, CI=1.69-8.40). One hundred forty-eight Hispanic and African American women with newly diagnosed invasive cervical cancer residing in Chicago participated in a questionnaire to investigate potential barriers to cervical cancer screening (Behbakht, Lynch, Teal, Degeest, & Massad, 2004). A comparison between those women who never had a Pap test (never Pap) and those women who had received a Pap test before (ever Pap) their diagnoses was made. A significantly higher proportion of women in the “never Pap” group had not completed a high school education. A qualitative study conducted using focus groups with 225 low-income Latina immigrants and non-Latinas of reproductive age who attended a Women, Infants, and Children (WIC) clinic was performed to determine examine the sociocultural factors associated with cervical cancer screening among low-income Latina immigrants (Scarinci et al., 2003). When immigrant Latinas were compared to non-Latinas it was found that all of the non-Latinas had ever had a Pap test while only 81% of the immigrant Latinas had done the same ( $\chi^2=22.98$ ,  $p<0.001$ ) and the immigrant Latinas had significantly lower levels of education than the non-Latinas ( $p<0.05$ ).

A third predisposing factor that influences the receipt of Pap testing is the ability to communicate in English. Language barriers precipitate health disparities in that patients who do not speak English often receive suboptimal health care. Four studies explored the contribution language made to the receipt of Pap testing. Jacobs, Karavolos, Rathouz, Ferris, & Powell (2005) examined the relationship between the ability to speak English and the receipt of a cervical and breast cancer screenings in a multiethnic group of women in the U.S. Longitudinal data from 1247 respondents from the study of Women Across the Nation was analyzed. The authors found reading and speaking only a language other than English or reading and speaking a language more fluently than English, were significantly and negatively associated with receipt of cervical cancer screenings in unadjusted models. After adjusting for sociodemographic variables, the inability to speak English well, or at all, remained negatively associated with receipt of cancer screenings (OR=0.55, CI= 0.40-0.77). Behbakht et al. (2004) found women who did not speak English well were even less likely to know signs and symptoms of and risk factors and screening guidelines for cervical cancer. In a study conducted by Wallace, Hunter, Papenfuss, DeZapian, Denman, & Giuliano (2007) the public use files of the 2000 NHIS were examine how the use of preventive services among Mexican Americans, recent Mexican immigrants, and long-stay Mexican immigrants are affected by nativity, language, & access to care. After controlling for sociodemographic characteristics Mexican immigrants were the least likely to use preventive services including Pap testing. In the full logistic regression model, being monolingual Spanish significantly increased the odd of not receiving a Pap test. Fernandez & Morales (2007) analyzed data from the 2000, 2002, and 2004 Texas Behavioral Risk Factor Surveillance surveys to

examine the factors associated with disparities in cancer screening between border and non-border residents by language of the interview (Spanish or English) among Texas Hispanic women. After controlling for socioeconomic and demographic characteristics, women who selected to be interviewed in Spanish were less likely to report cancer screenings than women who selected to be interviewed in English.

Research has indicated a Latinas marital and family status are associated with Pap testing. Four studies found a positive association between marriage, children, and the receipt of a Pap test in one's lifetime. Koval, Riganti, & Foley (2006) interviewed 70 uninsured Latinas who immigrated to the U.S. within the last ten years using structured surveys. The purpose of the study was to evaluate the knowledge and attitudes that affect cervical cancer screenings. The principle findings included being married and having the same health care provider predicted better cervical cancer screening in multivariate analyses. The authors concluded married women were more likely to receive an initial Pap test to obtain birth control. Pap tests are often performed in conjunction with prenatal care. Several researchers found women who had deliver children were the most likely to have received a Pap test apparently in the course of their prenatal examinations (Buki et al., 2007; Owusu et al., 2005; Watkins, Gabali, Winkleby, Gaona, & Lebaron, 2002).

A number of studies used nativity status/ length of time residing in the U.S. as a proxy measure of acculturation. Researchers theorized that as time in the U.S. increases, health practices of immigrant Latinas converged with native-born Latinas. Three studies assessed if length of residence was associated with Pap testing practices. In the study conducted by Abraido-Lanza et al. (2005) length of residences among foreign-born Latinas as a measure for acculturation. After adjusting for sociodemographic factors

multiple logistic regression analysis showed no effect of this measure of acculturation on Pap testing. Behbakht et al. (2004) study of one hundred forty-eight Hispanic and African American women with newly diagnosed invasive cervical cancer found a significantly higher proportion of women in the “never Pap” group had lived in the U.S. less than 5 years. Tsui, Saraiya, Thompson, Dey & Richardson (2007) analyzed four years of the National Health Interview Surveys (NHIS) (1998, 1999, 2000, 2003) data to determine the screening rates among foreign-born women by birthplace and duration in the U.S. After adjusting for demographic characteristics and health indicators the authors found recent immigrants (those with < 25% of their lifetime in the U.S.) were significantly less likely ( $p < .001$ ) of ever receiving a Pap test than U.S.-born women or established immigrants (those with  $\geq 25\%$  of their lifetime in the U.S.). Using data from the 1998 NHIS, Goel et al. (2003) conducted a cross-sectional study to determine whether race/ethnicity or foreign birthplace explains ethnic disparities in cancer screenings. After adjusting for sociodemographic characteristics and illness burden, U.S.-born Hispanic respondents were significantly less likely than U.S.-born white women to report cancer screenings. When race/ethnicity and birthplace were considered, U.S.-born Hispanic respondents were as likely as U.S.-born white women to report cancer screenings. However, foreign-born Hispanic women were less likely (AOR=0.65, CI=0.53-0.79) than U.S.-born white women to report Pap testing. The authors conclude foreign birthplace explained some disparities previously attributed to race or ethnicity and is an important barrier to cancer screening. There have been no studies that have made comparisons between Pap testing practices within Latina subgroups and nativity and length of time in the U.S.

In summary, research indicates while minority women have encountered substantial barriers to cervical cancer screening, the support of a relationship between predisposing factors and the receipt of a Pap test is inconsistent. This is likely due, in part, to methodological differences in study designs, populations sampled, and other unforeseen factors which influence this population. Studies focusing on nativity and time in the US have not included other predisposing factors and, thus, the current study will add new knowledge to the understanding of predisposing factors.

#### *Enabling Factors*

Access to health care is determined by a person's ability to receive health services and their ability to pay for those services. Latina immigrants are more likely to be uninsured and face barriers to accessing medical care. Five studies found, when compared to U.S.-born Hispanics, immigrant Hispanics were significantly less likely to have health insurance. Goel et al. (2003) found in their study, foreign-born Hispanics who lacked health insurance also experienced poor access to the health care system. Scarinci, Beech, Kovach, & Bailey found lack of health insurance a barrier to cervical cancer screening. Additionally, in a telephone survey of 803 Latinas, of which 160 were undocumented Latina immigrants residing in Orange County, CA, Chavez (1997) reported that undocumented Latinas often do not have job related benefits that include health insurance. Also, to compare health care access, utilization indicators, insurance status and participation in chronic disease screenings in women 40 and over, Hunter et al. (2003) conducted a cross-sectional, population based survey with 456 women in a pair of contiguous U.S.-Mexico border communities. Findings from this study, which included Hispanic women residing in Mexico as well as those residing in Arizona, reported a lack

of insurance was a major barrier in obtaining cancer-screening tests. Furthermore, in an analysis of the 1998 California Women's Health Survey, Rodriguez, Ward, & Perez-Stable (2005) investigated cervical cancer screening rates, socioeconomic factors and health insurance status among 3340 women who were foreign-born Latina, U.S.-born Latina or non-Hispanic whites. Findings concluded that a lack of health insurance was the strongest independent predictor of low utilization rates for Pap tests and remains one of the strongest predictors for cancer screening underutilization.

To determine if not having a usual or regular source of care presented a barrier to cancer prevention, researchers in five studies evaluated this aspect. An analysis of Hispanic subgroups from the 1990 and 1992 pooled data from the NHIS, Zambrana, Breen, Fox, & Gutierrez-Mohamed (1999) examined factors that predicted cervical cancer screening among Hispanic subgroups and reported having a usual source of care predicted being current with cervical cancer screenings for both foreign and U.S.-born Hispanics. Owusu et al. (2005) found that women who had a usual health care provider were more likely to have had a Pap test than women without a usual source of care, whereas Koval, Riganti, & Foley (2006) found women who regularly saw the same provider were 5.5 times more likely to have repeat Pap tests. In contrast the study conducted by Chavez et al. (1997) found undocumented Hispanics who reported no usual source of care reported fewer health professional interventions or preventive services. Furthermore, foreign-born Hispanics who reported having no usual source of care were less likely to report Pap testing (Goel et al., 2003).

Six studies indicated cost as a barrier to cancer screening. Fernandez, Tortolero-Luna, & Gold (1998) interviewed 148 low-income, low literate, foreign-born Hispanic



women to ascertain what factors influenced their cervical cancer screening practices. The authors reported barriers related to the cost of prevention and treatment of cervical cancer included poverty, lack of transportation, and lack of childcare. Owusu et al. (2005, p. 292) states, “data supports the conclusion that income is a significant barrier for some women who report that they had to choose between health care and basic needs”. Moreover, Agurto et al. (2004) found financial dependence on one’s spouse acted as preexisting barrier and was related to the perceived costs of treatment and medicines and thus, deterred screening.

Citizenship status is also a reported barrier to cancer screening. Undocumented immigrants may fear deportation and are less likely to use medical services. Since they have no regular source of health care, this makes preventive health measures a low priority and difficult to obtain (Borrayo & Guarnaccia, 2000; Chavez et al., 1997) In summary, research indicates while minority women have encountered substantial barriers to cervical cancer screening, the relationship between access to health care and the receipt of a Pap test is reasonably consistent. However, there is a lack of research including other enabling factors that influence Latinas receiving Pap testing.

#### *Need-For-Service*

There is limited research to support that need-for-service precipitates cervical cancer screenings. Agurto et al. (2004) reported the women did not perceive cervical cancer as a disease that could be prevented and that prior knowledge about the risk factors, that cervical cancer results from a sexually transmitted disease, was usually not known among the women. In contrast, a cross-sectional study of 4208 women conducted at two sites, Mexico City and Oaxaca in Mexico, Lazcano-Ponce et al. (1997) looked at

factors to predict participation with Pap test utilization and found that the main predictor for use of the Pap test was knowledge that the Pap test detected cervical cancer.

Additionally, Wallace et al. (2007) found most Latinas agreed with statements that “*Most cancers are preventable*” and “*A Pap smear can detect cervical cancer*”. In addition, there is some indication of the importance of participating in more than one cancer screening. If a woman participates in one cancer screening; she is more likely to participate in other cancer screenings (Buki et al., 2007). There is limited research on the relationship between need-for-service factors and the receipt of a Pap test. Exploring this factor relationship with the other constructs merits further evaluation in this study.

#### *Health Behaviors*

Three studies indicated Hispanic women failed to consider their own health a priority. Lack of signs or symptoms resulted in women waiting until the manifestation of the disease or the appearance of symptoms before obtaining an exam (Agurto et al., 2004). In the Hunter et al. (2003) study conducted on the U.S. and Mexican border, it was reported that the majority of respondents in both countries reported only seeing a doctor when they felt sick. In addition, Wallace et al. (2007) reported women stated that they only go to the doctor when they are sick. Another study found immigrant Latinas have a stoic attitude toward health and illness and only seek health care for their symptoms when they become severe or unbearable (Scarinci et al., 2003). There is limited research on the relationship between the health behavior factors and the receipt of a Pap test. Exploring this factor relationship with the other constructs merits further evaluation in this study

#### *Implications for Practice*

Women who migrate to the United States bring with them their own knowledge,

beliefs and experiences regarding their health and health care usage. Knowing and understanding these beliefs provides the underpinnings for programs that help to increase cancer screening among Latinas. Nurses who become culturally aware of the inaccurate knowledge and traditional health beliefs of immigrant Latinas can address these issues during an office visit or community contact using culturally sensitive language and appropriate material. Nurses and other health care providers must not only discuss the risks and benefits of screening tests so that each woman can make an informed decision, but must also advocate for the use of screening in this population. Development of strategies that aid in making Pap testing a social norm and assists in preserving a women's ability to care for their families, may emerge as a way to offset longstanding health beliefs or stoical attitudes about self care. Exerting an influence on the incidence and mortality rates of cervical cancer experienced by immigrant Hispanic women can only be achieved by improving the screening practice for these women.

#### *Summary*

As part of the fastest growing segment of the United States population, Hispanic women face multiple barriers to cervical cancer screening. This literature review summarizes some of the barriers faced by this population. Research to date is limited on how the theoretical constructs work in synergy to influence screening practices of Latinas and there is no research identified among Latina subgroups. Exploring the relationship between nativity and length of time in the U.S. and how the theoretical constructs influence screening practices is necessary before appropriate and acceptable interventions can be created. This study will describe and analyze the influence of predisposing, enabling, need-for-service, and health behavior factors on cervical cancer screening in a

sample of Latinas residing in California. .

#### Research questions

1. Have the percentages of cervical cancer screening rate changed for Latinas who reside in California by nativity and length of time in the U.S. between 2001 and 2005?

#### *Specific Aims:*

- To describe percentages of cancer screening for native and foreign-born Latinas from 2001 to 2005.
  - To compare the rates between native and foreign-born Latinas from 2001 to 2005.
2. What factors are associated with the receipt of cervical cancer screening among native and foreign-born Latinas who reside in California?

#### *Specific Aims:*

- To describe factors associated with cervical cancer screening for native and foreign-born Latinas who reside in California.
- To examine the relationship between time since immigration and the receipt of cervical cancer among foreign-born Latinas who reside in California.
- To compare the relationships among demographics, socioeconomic status, acculturation, health insurance status and access to the health care system between foreign-born Latinas and native Latinas who reside in California.

## CHAPTER THREE

### Description of the California Health Interview Survey Original Study

The data used for analysis for this study was collected by The California Health Interview Survey (CHIS) team. The CHIS is the nation's largest state health survey. The survey is conducted by the University of California, Los Angeles (UCLA) Center for Health Policy Research in collaboration with the California Department of Health Services (CDHS), and the Public Health Institute (PHI). The CHIS is a population-based, cross-sectional, biennial health interview first administered in 2001. It is a random-digit-dial (RDD) telephone survey that uses a multi-stage sampling design drawn from selected households in every county in California and is designed to provide health-related estimates for the overall population, the largest ethnic/racial groups, and several smaller ethnic/racial groups. This sampling frame yields a sample that is representative of the state's civilian, non-institutionalized population (Ponce et al., 2004). The CHIS collects information on key health indicators for all age groups including information on health status, health insurance coverage, access to health care, health behaviors, disease prevention, and other health issues (Brown, Holtby, Zahnd, & Abbott, 2005). Information was collected from more than 56,000 adult individuals in 2001, 42,000 in 2003, and 45,000 in 2005 (California Health Interview Survey, n.d.).

#### *Sample Design*

Adult individuals age 18 and older, were eligible if they resided in a house, apartment, or mobile home with their families, extended or multiple families, or unrelated persons provided the dwelling had less than nine residents. Those living away from their home temporarily (e.g., college students, hospitalized patients) were eligible and

enumerated at their usual place of residents. Individuals in units occupied by nine or more unrelated persons, institutionalized persons, the homeless, transient persons, as well as those who resided in military barracks were excluded. In addition, individuals without a landline telephone did not have a chance for sample selection (California Health Interview Survey, 2007a). To generate the sampling frame, the CHIS team used a geographically stratified, two-stage list assisted RDD sample design. The sample was selected using an RDD approach combined with surname list samples which increased the number of interviews with the select minorities. Specific minority groups were targeted for oversampling depending on the survey year (California Health Interview Survey, 2007a).

#### *Data Collection Methods*

The original questionnaire was developed for the CHIS 2001 cycle. The design was driven by the research needs of UCLA and sponsoring agencies, as well as a variety of other governmental, academic, and other partners. In addition, respondent burden, response rates and costs were taken into consideration. The CHIS 2003 and 2005 questionnaire included many of the items from both previous cycles as well as new items. (California Health Interview Survey, 2007c). The questionnaires were translated into Spanish, Chinese, Korean, and Vietnamese. The CHIS team decided unchanged items from prior translated questionnaires would not require a new translation (California Health Interview Survey, 2007c). The original 2001 questionnaire was culturally and linguistically adapted by the Multi-Cultural Issues Technical Advisory Committee (MCTAC). Prior to translation the instrument was tested for cultural appropriateness using focus groups with English-speaking minorities. Once the group participants found

the items to be understandable and not culturally offensive, the questionnaire was translated. (Ponce et al., 2004).

The CHIS used a list-assisted RDD method to gain access to individuals to be included in the sample. Prior to the implementation of the interviewing process, the CHIS Principal Investigator sent an advance letter about the survey to all sampled telephone numbers for which an address was available. Included in this mailing was a refusal response where the individual could return a form and refuse to participate in the interview. If a refusal response was received, in hopes of converting a refusal into a cooperator, an additional letter was then sent to again request permission for a screening interview (California Health Interview Survey, 2007c).

Once a household was identified and selected the CHIS interview could include up to three substantive questionnaire sections: the adult, adolescent, and child extended questionnaires. The interview consisted of a two-step process. First a screening interview was conducted to determine eligibility, then, if the individual was determined to be eligible, an extended interview was conducted. The extended interview was the full questionnaire for the adult, adolescent, or child. An initial screening interview was first conducted to request survey participation, identify an adult 18 years or older who resided in the household, determination if the residence was associated with the dialed telephone number, and how many adults 18 or older resided in the household. If more than one adult lived in the household, one adult was randomly selected by the CATI system to participate in the interview. If an initial attempt resulted in a 'no answer' multiple attempts, up to 14, were made to establish contact with a household. Additional calls were placed over several days at varying times of the day and evening to find a time

when someone would be available. If no contact was made after 14 attempts, the telephone number was retired. Once a contact was made and the individual's participation was established, the extended interview was conducted in the participant's language of choice (given the availability of the translated interviews). Interviews were counted as complete if the respondent finished 80 % of the questionnaire (through section J) (California Health Interview Survey, 2007c). The number of completed adult extended interviews along with the response rates are listed in table 3.1. While survey response rates have declined over the past several decades, the CHIS rates are comparable to other national surveys (Kempf & Remington, 2007).

Table 3.1. Completed adult extended interview with response rates

	2001	2003	2005
Completed adult interviews	55,428	42,044	43,020
Response rate (%)	63.7	60.0	54.0

The interviews were conducted using a Computer-Assisted Telephone Interview Testing (CATI) system. CATI is a method whereby an interviewer uses a computer to conduct the interview by reading the questions from the computer screen and then keying the responses into the computer. The advantages of using this method include increased speed, accuracy, and ability to monitor quality. (California Health Interview Survey, 2007c).

#### *Sample Weighting*

To compensate for the probability of selection and other factors which may have directly resulted from the design and administration of the survey, weights were applied



to the sample data. To produce population estimates from the CHIS data the sample was weighted to represent the non-institutionalized population for each sampling stratum and statewide.

#### *Imputation Methods*

To enhance the analytic utility of the CHIS data files, missing values were replaced through imputation for nearly every variable. Two imputation procedures were used. The first technique was a completely random selection from the observed distribution of the responses. This method was only used for a few variables if the percentage of items missing was very small. The second technique used the hot deck imputation without replacement. This method uses data from other observations in the sample to replace missing values (California Health Interview Survey, 2007b).

#### Current Study Research Design

##### *Data Source*

This study is a secondary data analysis using data collected by the adult sample component of the CHIS. Data available from the Public Use Files (PUF) were accessed for analysis. Data from the 2001, 2003, and 2005 CHIS sample adult questionnaires were combined to increase the sample size and reliability of data based on women categorized by Hispanic ethnicity and birthplace (native-born or not).

##### *Study Population*

This study sample includes 16,707 female respondents age 18 and older, who self identify as Hispanic. Only data from those who responded to the question “Have you ever had a Pap smear test to check for cervical cancer?” was used in the analysis. Table 3.2 shows the total sample and the number of Latinas who completed the CHIS for each

survey year. The country of origin for the participants who self identified as Hispanic was collected. Latinas reported their countries of origin as: Mexico, Central America, Other Latin America, and Other.

Table 3.2. Total interviews, Hispanic respondents, and female Hispanic respondents per survey year

	2001	2003	2005	Total
Total Adults	55,428	42,044	43,020	141,343
Hispanic*	11,840	8,770	8,036	28,646
Female Hispanics (%)	6907 (58.3)	5013 (57.2)	4787 (59.6)	16,707 (58.3)

\*Self Identified as Hispanic or Latino

### *Procedure*

Initially, key factors known to be predictive of cancer screening in the general population were identified from the literature (Hiatt et al., 2002). Next, the variables of interest were examined to ensure concurrence among the three survey years. Variables were assessed to determine if the questions asked and the responses were similar. Once the variable outcomes were found to be in agreement, the final variables were applied to the BMVP theoretical framework to build a general model for predisposing, enabling, need, and health behavior categories. The CHIS interviews included questions relating to demographics, socioeconomic status, acculturation, cancer history, general health status, women's health, access to health care, and health insurance status. The BMVP framework groups the use of health services as a function of predisposing, enabling, need, and health behavior factors. Appendix A shows the final variables grouped by theoretical construct, the response measurement, and the variable type.

Differences were found in labels and values for several of the selected variables over the three survey years. Variables with differences in responses were further

evaluated to ensure any conversions would maintain the data integrity. The following variable changes were made and are described using the theoretical characteristics as a guide.

### *Variables recoded*

#### Predisposing

- Education: no formal education was added to Grade 1-8 and relabeled “less than 8<sup>th</sup> grade”
- Hispanic subtypes: Nine Hispanic subtypes were recoded for the 2003 and 2005 surveys to replicate the 2001 survey categories.
- Language spoken at home: the 2001 categories were recoded to match the 2003 and 2005 categories.
- English proficiency: the 2003 and 2005 categories were recoded to match the 2001 categories

#### Enabling

- Annual household income: the 2003 and 2005 continuous data were collapsed to match the 2001 categories.
- Reason for no usual source of health care: the 2001 categories were recoded to match the 2003 and 2005 categories.
- Reason for no health insurance: the 2001 categories were recoded to match the 2003 and 2005 categories.

New variables created from the existing variables for the following:

- Birthplace from country born in (born in US) for the 2001 survey year

- Ever diagnosed with cancer from “ever diagnosed with breast cancer” and “ever diagnosed with cancer, other than breast cancer” for all survey years.
- A categorical variable was created from the continuous age variable.
- A new variable was created to indicate survey year

Crosstabs were then computed with old variables and new recoded variables to ensure no data were miscoded or lost.

The data sets from the three survey years were then merged to create one dataset. A new dataset was created of only those respondents who met the inclusion criteria of female, self identified as Hispanic. The ACS guidelines state women who have had a total hysterectomy may stop having Pap tests unless the surgery was done as a treatment for cervical cancer. Since it is unknown if hysterectomized women in this sample were having Pap tests or not, women who had a hysterectomy were excluded. In addition, women who had a prior diagnosis of cervical cancer were excluded.

The final dataset was made up of those respondents who were self-identified Latinas who had never had a hysterectomy or been diagnosed with cervical cancer, and had responses to all variables used in the analysis. Respondents (n=2918) were eliminated from the sample who either “refused to answer or responded “don’t know” to any of the questions used to create the variables selected for analysis in this study. The final sample size used for analysis was 13,789 respondents. Of the total sample of Latina respondents, 6130 (40.1%) were native-born and 7659 (59.9%) were foreign-born.

Table 3.3 shows the sample per survey year.

Table 3.3. Total Sample per survey year

	<b>2001</b>	<b>2003</b>	<b>2005</b>	<b>Total</b>
Native-born	2314	1969	1847	6130
Foreign-born	2868	2584	2207	7659
Total Female Hispanics (%)	5182 (27.5)	4553 (36.7)	4054 (35.8)	13,789 (100)

Frequencies and descriptive statistics were computed to begin to describe the characteristics of the sample and to ensure there was no violation of the assumptions underlying the statistical techniques used in further analysis. The outputs were assessed and a set of final variables that combined categories due to no or low responses was developed. Appendix B shows the initial set of variable categories along with the final set of variable categories.

#### Study Variables

##### *Dependent Variables*

For the first study aim, the primary outcome measure was receipt of a Pap test in your lifetime (referred to as “Ever Pap”). This is a dichotomous variable indicated by a yes or no response and the response is self-reported. The question and prompts for 2001 and 2005 surveys were as follows:

Have you ever had a Pap smear test to check for cervical cancer?

[IF NEEDED, SAY: "A Pap smear is a routine cancer test for women in which the doctor examines the cervix during a gynecological exam, and takes a cell sample from the cervix with a small stick or brush and sends it to the lab. This is not a test for detecting sexually transmitted diseases."]

In 2003 the question was slightly modified to:

Have you ever had a Pap smear?

[IF NEEDED, SAY: “A Pap smear is a routine cancer test in which the doctor takes a cell sample from the cervix with a small stick or brush and sends it to the lab. This is not a test for sexually transmitted diseases.”]

For the second study aim, the outcome variable is the rate of cervical cancer screening, and is measured in each year of the CHIS.

#### *Independent Variables*

For the main independent variable, a variable for birthplace was created to indicate if the respondent was “native-born” (reference group), “lived in the U.S. for less than five years”, or “lived in the U.S. greater than or equal to five years”. The five year cutoff point was deemed reasonable since research indicates after ten years the health of immigrants who live in the U.S. converges with the health status of native-born persons. This measurement is consistent with the current literature (Kagawa-Singer & Pourat, 2000; Zambrana et al., 1999).

#### *Predisposing variables*

- Age was collapsed into a categorical variable with the “50-59” year old group assigned as the reference group for comparative analyses. This was done since this group is the most likely to have had access to Pap testing during their entire adult lifetime (Agurto et al., 2004; American Cancer Society, 2008c). Age was also available as continuous data.
- Marital status was re-categorized as “married” (reference group), “not married”, and “never married”.

- Education attainment categories were combined to create a new variable of “less than 12 years of education”, “12<sup>th</sup> grade education or high school diploma”, and “education beyond 12<sup>th</sup> grade” (reference group).
- The nine Latina subtypes were combined to create a new variable to include “Mexican” (reference group), “Central American”, “Puerto Rican”, “South American”, “Other”, and “2+ Latino Types”.
- Family type remained categorized as “Single, 18 Years Old”, “Single Young Adult, 19-20”, “Single Adult, 21+”, “Single with Kids”, “Married, No Kids”, and “Married with Kids” (reference group).
- The country the respondent was born was consolidated to “United States” (reference group), “Mexico”, “Central America”, “Other Latin America”, and “Other”.
- Language spoken at home was re-categorized to “English” (reference group), “Spanish”, “English & Spanish”, and “Other”.
- How well you speak English was remained categorized as “Very Well” (reference group), “Well”, and “Not Well / Not At All”.
- Citizenship status stayed “U.S. born Citizen” (reference group), “Naturalized Citizen”, and “Non-Citizen”.

*Enabling variables*

- Total annual household income categories were grouped into the five categories of “\$ 0-10,000 (reference group)”, “\$ 10,001-20,000”, “\$ 20,001-30,000”, “\$ 30,001-40,000”, “\$ 40,001-50,000” (reference group), or “\$ 50,001+”.
- Currently insured remained “Yes” (reference group) or “No”.

- Have usual source of health care remained “Yes” (reference group) or “No”.
- Source of usual source of health care were collapsed to “Doc office/HMO/Community/ government clinic or hospital” (reference group), “Emergency room/urgent care/ one place”, or “No usual source of care”.
- Family poverty threshold level (FPL) was coded as “0-99% FPL, 100-199% FPL, 200-299% FPL, or 300% FPL and above (reference group),”
- Food security level remained “Food Security (reference group)”, “Food Insecurity W/O Hunger”, or “Food Insecurity W/ Hunger”.

#### *Need Variables*

- The initial categories for General health condition were combined to create a variable with three categories, “Excellent/ Very Good (reference group)”, “Good”, or Fair/Poor”.
- Overweight remained “Yes” (reference group) or “No”.
- Ever diagnosed with any cancer remained “Yes” (reference group) or “No”.
- Doctor recommended Pap smear stayed “Yes (reference group), / No”
- How long since most recent Pap smear was kept as “Within the past 3 years (reference group), 3-5 Years ago, More than 5 Years ago, or Never”

#### *Health Behaviors*

- How long since last saw doctor about own health was kept as “Within The Last Year (reference group), 1 to 2 Years Ago, 2 to 5 Years Ago, More Than 5 Years Ago, or Never”
- Current smoking habits stayed “Currently Smokes, Quit Smoking, or Never Smoked Regularly (reference group),”



- A variable for alcohol use was considered, however the sample size (n= 5800) did not contain data from all the respondents used in the analysis.

### Data Analysis Plan

All data analyses were conducted using Stata 10.1 to accommodate for the CHIS' complex study design that requires proper weighting to obtain the proper variance calculations of the estimates. An  $\alpha=.05$  was used for determination of statistical significance in final regression models. The data analysis was done in five phases: the first two represent descriptive analyses of the data from this survey over time and the characterization of the Latinas in the sample; the last three represent the analytic process to answer the primary question about the association between nativity and time since immigration and cervical cancer screening.

First, to explore the cervical cancer screening rates for native Latinas, recent immigrant, and established immigrants from 2001 to 2005, percentages of those who reported ever having a Pap were calculated. Then to test the statistical significance when taking into account other covariates, a logistic regression model was built with an interaction between nativity and survey year at an  $\alpha = 0.05$ .

Second, descriptive statistics were computed to characterize Latinas by birthplace prior to the analysis of the study specific aims. Descriptive statistics, including means and standard deviations was calculated for all quantitative variables. Frequencies were conducted and percentages were calculated for categorical variables.

Third, regression models construction began by examining the main independent variable of native or time since immigration against the dependent variable of Ever Pap using Chi-square testing. Then, within each theoretical construct, predisposing, enabling,

need-for-service, and health behavior, each of the other independent variables were examined in a bivariate analysis with an  $\alpha = 0.05$  using Chi-square tests with Ever Pap. This was done to determine which variables to include in the regression model. In addition, to assess if variables were interrelated and represented the same concept, correlations were computed for the following variables: income, poverty level, and food security; insurance status, usual source of care, and source of health care; and marital state and family type.

Fourth, a multivariate logistic regression model was built using those variables significantly associated at  $\alpha=.05$  with the dependent variable in the bivariate analyses, in order to assess their contribution on screening, while controlling for other covariates. Logistic regression models were built for each of the four theoretical constructs by both traditional and vulnerable domains so that a total of six models were built.

Fifth, a multivariate logistic regression model was built using all covariates found to be statistically significant in the prior models. This model included nativity, the main variable of interest, and survey year to control for changes over time.

#### Human Subjects Protection

Prior to the initiation of this research, all necessary approvals were received from the dissertation committee and the University of California at San Francisco's Committee on Human Research. In addition, the researcher signed a confidentiality agreement prior to downloading and use of the CHIS Public Use Files.

## CHAPTER FOUR

## Phase One: Estimation of change

An investigation was conducted to determine if a change in Pap testing occurred over time. The analysis indicated a 3% ( $p=.005$ ) decrease in Pap test between 2001 and 2005. In the analysis that included nativity there was no significant difference between time and acculturation. The results are presented in Table 4.1. To confirm there was no significant difference in Pap testing over time, an interaction between time and

Table 4.1. Changes in Pap testing for Latinas between 2001 and 2005 by Nativity.

Characteristic	$\beta$	p-value	95% CI	
	coefficient		Lower bound	Upper bound
All	-0.03	0.005	-0.045	-0.008
Native-born	-0.02	0.154	-0.058	0.009
Recent Immigrants	0.01	0.886	-0.039	0.100
Established Immigrants	-0.03	0.051	-0.051	0.0001

acculturation on Pap testing was explored. The interaction term was not statistically significant. However, it is more instructive to visually examine each group separately. See Figure 4.1. There was a change in Pap testing for established immigrants ( $p= 0.05$ ). The rate of Pap testing decreased steadily (by approximately 2%) between the 2001 and 2005 surveys. The trend for recent immigrants decreased from 2001 to 2003 then increased from 2003 to 2005 ( $p=.88$ ) for an average increase of approximately 1% since the survey began. Native-born Latinas increased from 2001 to 2003, but decreased from 2003 to 2005 ( $p=0.15$ ) for an average decrease of 3% since the survey's inception. Established immigrants progressively decreased their rate of Pap testing since the commencement of the survey. The total rate of decline for established immigrants was 3%.

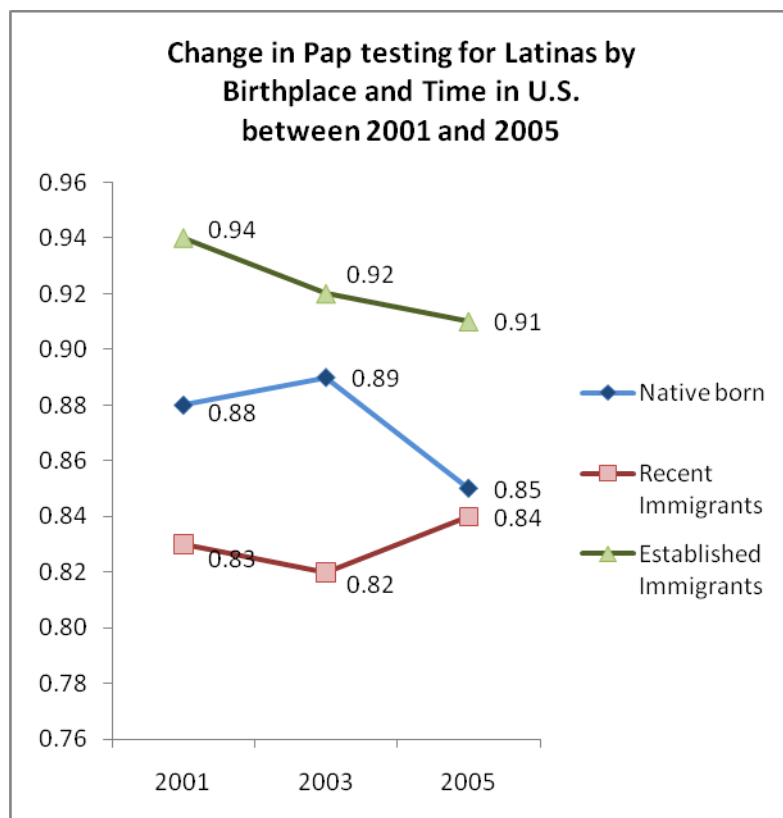


Figure 4.2. Change in Pap testing rates for Latinas between 2001 and 2005

#### Phase Two: Sample Characteristics of Latinas by Nativity

There were 13,789 Latinas aged 18 to 85 in the analysis from the CHIS survey years 2001, 2003, and 2005. The breakdown of native-born, recent immigrants (those who lived < 5 years in the US), and established immigrants (those who lived  $\geq$  5 years in the US) by survey year is illustrated in Table 4.2. The percentage of Latinas within each subgroup was fairly consistent by survey year, however the per group percentages were somewhat skewed. Over half of the sample were established immigrants, followed by native-born Latinas. Recent immigrants made up the smallest percentage with approximately seven percent of all Latinas having lived in the U.S. less than five years.

Table 4.2. Latinas aged 18 to 85 in the analysis from the CHIS survey years 2001, 2003, and 2005 by birthplace and acculturation

Table 4.2. Latinas aged 18 to 85 in the analysis from the CHIS survey years 2001, 2003, and 2005 by birthplace and acculturation

Survey Year	Native-born		Recent Immigrants		Established Immigrants		Total
	N	%	N	%	N	%	N
2001	2314	38.0	236	5.6	2632	56.4	5182
2003	1969	38.8	281	7.7	2303	53.5	4553
2005	1847	43.0	223	6.9	1984	50.0	4054
Total	6130	40.1	740	6.9	6919	53.0	13789

The predisposing variables by nativity are reported in Table 4.3. The majority of Latinas were young; 84% of native-born, 95% of recent immigrants, and 82% of established immigrants were under the age of 50. However, 60% of the recent immigrants were between the years of 18-29, while 68% of native-born and just under 60% of established immigrants were between the ages of 18-39. Of the foreign-born women, 11.4% lived in the US less than 5 years and 88.6% lived in the US equal to or greater than 5 years. Over 60% of both recent immigrants (64%) and established immigrants (60%) had less than a high school education while more established immigrants than recent immigrants (20% vs. 15%) had more than a high school education. Native-born Latinas were better educated with almost half (49%) having more than a high school education. More established immigrants than recent immigrants or native-born were married (57%, 50%, 42% respectively), however, more native-born were never married (34%) compared to recent immigrants (20%) or established immigrants (16%). The majority of Latinas reported having children; 47% of native-born, 60% of recent immigrants, and 68% of established immigrants reported having children. The predisposing variables of those vulnerable finds approximately three quarters (76%) of

recent immigrants and almost half (44%) of the established immigrants reported speaking Spanish only, while less than 3% of native-born Latinas do the same. However, more native-born than established immigrants or recent immigrants (54%, 51%, 20%) spoke both English and Spanish. Ninety-one percent of recent immigrants responded

Table 4.3. Characteristics of Latinas in California by Birthplace and Predisposing Domain

Predisposing Domain	Native-born N=6130		Recent Immigrants N=740		Established Immigrants N=6919		Total N=13789	
	N	%	N	%	N	%	N	%
<i>Traditional domain</i>								
Age								
18-29	2072	47.0	408	60.3	1423	24.4	3903	35.9
30-39	1515	21.1	217	27.0	2517	34.4	4249	28.5
40-49	1262	15.9	76	7.4	1683	23.6	3021	19.4
50-59	653	7.4	28	4.4	742	10.2	1423	8.6
60-69	353	4.3	7	0.6	347	4.4	707	4.1
70 +	275	4.3	4	0.4	207	3.1	486	3.4
Age								
Age in Years: Mean (SE)	34.9 (0.23)		29.4 (0.47)		38.9 (0.18)			
Marital status								
Married	2756	41.8	392	50.0	3936	57.2	7084	50.6
Wid/Sep/Div/ Lv w/ Partner	1788	24.1	211	29.7	2028	27.0	4027	26.0
Never Married	1586	34.0	137	20.3	955	15.8	2678	23.4
Education attainment								
Less than High School (HS)	769	16.9	433	64.2	3577	59.8	4779	42.9
12 <sup>th</sup> Grade or HS Diploma	2073	34.6	168	20.4	1563	20.1	3804	26.0
More than HS	3288	48.5	139	15.4	1779	20.1	5206	31.2
Latin/Hispanic subtypes								
Mexican	4182	71.1	607	82.3	5220	76.9	10009	74.9
Central American	137	2.6	77	11.6	1041	16.0	1255	10.3
Puerto Rican	197	2.9	1	0.00	7	0.07	205	1.2
South American	89	1.4	41	4.6	284	3.3	414	2.6
Other	606	7.7	10	1.0	179	1.8	795	4.1
2+ Latino Types	919	14.5	4	0.5	188	1.8	1111	6.8
Family type								
Single Young Adult, 18-20	448	12.6	51	9.3	131	3.2	630	7.4
Single Adult, 21+	1642	26.5	126	18.2	1121	16.4	2889	20.6
Single with Kids	1111	15.0	87	10.8	1329	15.7	2527	15.1
Married, No Kids	885	13.6	92	12.3	853	12.2	1830	12.7
Married with Kids	2044	32.3	384	49.4	3485	52.5	5913	44.2
<i>Vulnerable domain</i>								
Country respondent born in								
United States	6130	100	0	0	0	0	6130	40.1
Mexico			614	83.2	5324	77.8	5938	47.0
Central America			78	11.6	1108	16.8	1186	9.7
Other Latin America			44	4.4	381	4.4	425	2.6
Other			4	0.8	106	1.0	110	0.6

Predisposing Domain	Native-born N=6130		Recent Immigrants N=740		Established Immigrants N=6919		Total N=13789	
	N	%	N	%	N	%	N	%
Language spoken at home								
English	2759	40.4	9	1.1	236	2.4	3004	17.5
Spanish	107	2.5	543	75.6	2777	43.5	3427	29.2
English & Spanish	3087	54.3	172	20.3	3735	52.4	6994	51.0
Other	177	2.7	16	3.0	171	1.7	364	2.2
How well you speak English								
Very Well	5156	81.8	21	2.1	1180	14.7	6357	40.7
Well	831	15.5	48	6.6	1497	20.2	2376	17.4
Not Well / Not At All	143	2.6	671	91.3	4242	65.1	5056	41.8
Citizenship status								
U.S. born Citizen	6130	100	0	0	0	0	6130	40.1
Naturalized Citizen			24	2.4	2632	34.0	2656	18.2
Non-Citizen			716	97.6	4287	66.0	5003	41.7

they spoke English “not well or not at all” while almost 35% of established immigrants and 97% of native-born women reported they spoke English “Very well” or “Well”.

Table 4.4 defines the enabling variables. Compared to native-born Latinas (64%) nearly 90% of recent immigrants reported an annual household income less than \$30,000 with over 75% reporting annual household income under \$20,000. Fairing only slightly better, 71% of established immigrants reported an annual household less than \$30,000 and 51% reported making under \$20,000. Native-born Latinas were the most likely to have health insurance (84%) and more established immigrants than recent immigrants reported having health insurance (65% vs. 45%). Almost 90% of native-born Latinas, 82% of established immigrant and 66% of recent immigrants reported having a usual source of health care, with most receiving their care at a doctor’s office/HMO or at a community or government clinic (86%, 80%, 64%). The enabling vulnerable variables implied when compared to recent immigrants (11%), more than twice the number of established immigrants (24%) and 57% of native-born Latinas reported income greater than the 200% federal poverty level. However, this meant almost 90% of recent

Table 4.4. Characteristics of Latinas in California by Birthplace and Enabling Domain

Enabling Domain	Native-born N=6130		Recent Immigrants N=740		Established Immigrants N=6919		Total N=13789	
	N	%	N	%	N	%	N	%
<b><i>Traditional domain</i></b>								
Total annual household income								
\$ 0-10000	617	10.2	237	35.4	1204	18.1	2058	16.1
\$ 10001-20000	982	17.0	307	41.1	2220	33.3	3509	27.3
\$20001-30000	932	15.5	99	10.9	1350	19.6	2372	17.4
\$ 30001-40000	723	10.9	45	6.0	803	11.6	1571	10.9
\$ 40001-50000	600	9.9	26	3.7	406	5.5	1032	7.1
\$ 50001 +	2285	36.4	26	2.9	936	12.0	3247	21.2
Currently insured								
Yes	5347	84.4	344	44.5	4690	64.6	10381	71.1
No	783	15.6	396	55.5	2229	35.4	3408	28.9
Have usual source of health care								
Yes	5568	88.7	506	66.2	5866	82.2	11940	83.7
No	562	11.3	234	33.8	1053	17.8	1849	16.3
Source of usual source of health care								
Doc office/HMO/Com or Gov Clinic	5448	86.3	490	63.7	5749	80.8	11687	81.9
ER /urgent care /No one place	120	2.3	16	2.5	117	1.4	253	1.9
No usual source of care	562	11.3	234	33.8	1053	17.8	1849	16.3
<b><i>Vulnerable domain</i></b>								
Family poverty threshold level								
0-99% FPL	1001	18.7	435	60.7	2614	40.4	4050	33.1
100-199% FPL	1372	24.3	217	28.4	2415	36.0	4004	30.7
200-299%FPL	1037	16.5	53	7.5	826	10.8	1916	12.9
300% FPL and Above	2720	40.5	35	3.5	1064	12.8	3819	23.3
Food security level								
Food Security	5426	88.8	448	60.1	4963	71.0	10837	77.4
Food Insecurity w/o Hunger	446	7.5	205	29.0	1451	21.7	2102	16.5
Food Insecurity w/ Hunger	258	3.7	87	10.9	505	7.3	850	6.1

immigrants reported incomes less than the 200% federal poverty level and 40% suffered from food insecurity. In addition, 40% of recent immigrants, 28% of established immigrants, and 11% of native-born Latinas experienced food insecurity.

Traditional need measures in table 4.5 reflect that half of native-born Latinas reported their health as excellent, while most recent immigrants (79%) and established immigrants (75%) reported their health as either “good” or “fair/poor” vs. excellent. Over half of native-born Latinas (54%) and almost half of the recent immigrants (48%) were



overweight or obese while established immigrants were less so (38%) whereas few of native-born Latinas (3%), recent immigrants (2 %) or established immigrants (3%) had “ever been diagnosed with cancer”.

Table 4.5. Characteristics of Latinas in California by Birthplace and Need Domain

Need Domain	Native-born N=6130		Recent Immigrants N=740		Established Immigrants N=6919		Total N=13789	
	N	%	N	%	N	%	N	%
<b><i>Traditional domain</i></b>								
General health condition								
Excellent/Very Good	3202	50.4	163	21.1	1920	24.6	5285	34.7
Good	1885	32.3	347	47.7	2527	37.7	4759	36.2
Fair/Poor	1043	17.4	230	31.3	2472	37.7	3745	29.1
Overweight								
Yes	2719	53.7	351	47.5	2625	38.3	5695	42.1
No	3411	46.3	389	52.5	4294	61.7	8094	57.9
Ever diagnosed with any cancer								
Yes	179	2.9	20	1.7	197	2.7	396	2.7
No	5951	97.1	720	98.3	6722	97.3	13393	97.3

Table 4.6 reports the traditional health behavior variables. The majority of native-born Latinas (95%), recent immigrants (92%) and established immigrants (93%) Latinas had visited a physician in the last 2 years. In general, Latinas are not smokers,

Table 4.6. Characteristics of Latinas in California by Birthplace and Health Behavior Domain

Health Behavior Domain	Native-born N=6130		Recent Immigrants N=740		Established Immigrants N=6919		Total N=13789	
	N	%	N	%	N	%	N	%
<b><i>Traditional domain</i></b>								
How long since last saw doctor about own health								
Within The Last Year	5505	89.3	604	81.2	5959	85.3	12068	86.7
1 To 2 Years Ago	345	5.9	81	10.4	531	7.9	957	7.3
2 to 5 Years Ago	196	3.4	33	5.1	283	4.5	512	4.1
More Than 5 Years Ago	74	1.1	10	0.9	100	1.4	184	1.2
Never	10	0.3	12	2.5	46	0.9	68	0.7
Current smoking habits								
Currently Smokes	778	12.2	42	6.0	415	5.6	1235	8.3
Quit Smoking	1023	14.2	41	4.3	663	8.4	1727	10.5
Never Smoked Regularly	4329	73.6	657	89.6	5841	86.0	10827	81.3

90% of recent immigrants, 86% of established immigrants, and 74% of native-born Latinas responded they ‘never smoked regularly’.

### *Pap Testing Practices*

Pap testing percentages and practices are shown in Tables 4.7 and 4.8. Table 4.7 shows the percentage breakdown by survey year. This table indicates, while the majority of women had a Pap test in their lifetime, the rate of testing has declined over the survey years. Overall, of the total sample 89% of Latinas in the study sample reported ever having a Pap test in their lifetime.

Table 4.7. Latinas who reported a Pap test in their lifetime by survey year

Survey Year	Ever have a Pap Test?				Total
	Yes		No		
	N	%	N	%	N
2001	4859	90.7	323	9.3	5182
2003	4201	90.3	352	9.7	4553
2005	3711	87.9	343	12.1	4054
Total	12771	89.6	1018	10.5	13789

In the analysis of Pap testing by nativity, established immigrants (92.1%) were the most likely to report having a Pap test in their lifetime and that Pap test was received within the prior three years (Table 4.8). Among all Latinas, recent immigrants were the least likely to report Pap testing ( 82% reporting a Pap test in their lifetime and 81% reporting a Pap test with the prior three years) although high rates were present in this group as well. Native-born Latinas had intermediate rates with 87.3% reporting to have ever had a Pap test and 82.9% reporting a Pap test within the past two years. Of those who responded when asked if a doctor had recommended a Pap test in the past 12 months, the majority of all Latinas responded “no”. Least likely to have been asked were recent

immigrants (85.6%), followed by established immigrants (83.5%) and native-born Latinas (75.9%).

Table 4.8 Nativity and Pap testing

Pap Testing	Native-born N=6130		Recent Immigrants N=740		Established Immigrants N=6919		Total N=13789	
	N	%	N	%	N	%	N	%
Ever had a Pap smear								
Yes	5641	87.3	632	82.9	6498	92.1	12771	89.6
No	489	12.7	108	17.1	421	7.9	1018	10.4
How long since most recent Pap smear								
≤ 3 Years	5334	82.9	618	81.1	6198	88.1	12150	85.5
3-5 Years ago	151	2.4	10	1.5	147	2.2	308	2.2
> 5 Years ago	156	2.1	4	0.3	153	1.9	313	1.8
Never	489	12.7	108	17.1	421	7.9	1018	10.5
Doctor recommended Pap smear (n=5727)								
Yes	606	24.1	39	14.4	500	16.5	1145	19.4
No	1986	75.9	231	85.6	2365	83.5	4582	80.6
Total	2592	100	270	100	2865	100	5727	100

### Phase Three: Bivariate analysis

Table 4.9 presents the bivariate logistic regression results for associations between variables and receipt of a Pap test in one's lifetime. In reviewing the predisposing, traditional construct, as expected, the Latinas who were least likely to have received a Pap test in their lifetime were the youngest and the oldest Latinas, were single, had never married, and had less than a 12<sup>th</sup> grade or high school diploma. The greatest effect was for respondents who were never married (OR = 0.07,  $p < .001$ , CI = 0.06-0.09) versus those who were married. Looking at the age category, the effect was greater for respondents who were young adults, aged 18-29 (OR = 0.12,  $p < .001$ , CI = 0.08-0.18) than for Latinas who were between the ages of 50-59. Only half of Latinas aged 70 and older were as likely to have ever had a Pap test (OR = 0.46,  $p = .02$ , CI = 0.24-0.88). While among Latinas between the ages 30-49 and 60-69 there was no statistical significance in Pap testing when compared to Latinas aged 50-59. Single adults with children (OR =

0.01,  $p < .001$ , CI= 0.01-.02) and single adults without children (OR = 0.16,  $p < .001$ , CI= 0.13-0.21) were not as likely to have received a Pap test as compared to married Latinas with children.

Latinas with less than a 12<sup>th</sup> grade education were half as likely as those with more than a high school education to have ever received a Pap test (OR = 0.53,  $p < .001$ , CI= 0.43-.66). conversely, those with a 12<sup>th</sup> grade education or high school diploma were 1.5 times as likely as those with more than a high school education to have ever received a Pap test ( $p = .001$ , CI= 1.18-1.78).

Language spoken in the home and English proficiency had comparable associations with the outcome. Language was associated with receipt of a Pap test in that those Latinas who spoke both English and Spanish in the home were approximately two-thirds (OR = 0.66,  $p = .001$ , CI= 0.52-.85) as likely to have ever had a Pap test as those who spoke only English. English proficiency had a similar effect where Latinas who reported they spoke English “well” were also approximately two-thirds (OR = 0.64,  $p < .001$ , CI= 0.52-.80) as likely to have ever had a Pap test as those who spoke English “very well”. Interestingly, Latinas who spoke English “not well/at all” were 1.7 times as likely ( $p < .001$ , CI= 1.43-2.14) to have ever had a Pap test as those who spoke English “very well”.

An evaluation of the predisposing, vulnerable construct indicates increased time in the U.S. increased the likelihood of receiving a Pap test. Latinas who lived in the U.S. between 5 & 9 years were 1.4 times as likely ( $p = .02$ , CI= 1.05-1.97) to have had a Pap test as those born in the U.S. This value increase to 1.5 times as likely ( $p = .02$ , CI= 1.05-1.97) for those who had resided in the U.S. between 10-14 years and further increased to

1.9 times as likely ( $p < .001$ , CI= 1.51-2.47) for those residing in the U.S. 15 or more years. Looking at nativity and compared to US-born Latinas, there was no statistical significance for those immigrant Latinas with less than 5 years of residence in the U.S., however for those Latina immigrant with 5 or more years of residence, there was statistical significance (OR = 1.7,  $p < .001$ , CI= 1.40-2.06). In addition, immigrant Latinas who were naturalized citizens were 1.7 times as likely ( $p < .001$ , CI= 1.30-2.22) as Latinas born in the U.S. to have had a Pap test as well as those immigrant Latinas who non-citizens (OR = 1.4,  $p = .001$ , CI= 1.15-1.70).

An examination of the enabling, traditional construct indicates having a usual source of health care has the greatest impact on whether a Latina will have a Pap test. Those respondents who had a usual source of health care were 2.6 times as likely ( $p < .001$ , CI= 2.10-3.11) to have ever had a Pap test as those respondents did not have a usual source of health care. Latinas who were most likely to have a Pap test had health insurance, higher incomes, and lived in the U.S, longer. Those Latinas who had health insurance were twice as likely (OR = 2.1,  $p < .001$ , CI= 2.10-3.11) to have had a Pap test as those who did not.

Income had a modest effect on Pap testing. Those Latinas with an annual household income (AHI) of \$10,001 -\$20,000 were 1.4 times as likely to have ever had a Pap test ( $p = .004$ , CI= 1.12-1.86) as those with an AHI of less than or equal to \$10,000. The effect of income leveled off with Latinas with an AHI of \$20,001-\$30,000 ( $p = .001$ , CI= 1.22-2.05), \$40,001-\$50,000 ( $p = .03$ , CI= 1.05-2.39), and those with an AHI of \$50,001 or more ( $p = .002$ , CI= 1.19-2.18) were 1.6 times as likely to have receipt of a Pap test as those with an AHI of less than or equal to 10,000.

When looking at the enabling, vulnerable construct, poverty had an interesting effect on Pap testing. Those Latinas with a Federal Poverty Level (FPL) of 0-99% (OR = 0.67,  $p = .003$ , CI= 0.52-0.87) as was those in the 200-299% of the FPL (OR, .67,  $p = .005$ , CI= 0.50-.89) were about two-thirds as likely to have ever had a Pap test as those Latinas with a FPL of 300% or more. While Latinas in the 100-199% of the FPL were approximately three-quarters as likely (OR = 0.74,  $p = .02$ , CI= 0.58-.95) to have ever had a Pap test as those Latinas with a FPL of 300% or more.

Conversely, Latinas with food insecurity were more likely to have received a Pap test. Those with food insecurity without hunger were 1.7 times as likely ( $p < .001$ , CI= 1.27-2.18) to have had a Pap test and those with food insecurity with hunger ( $p = .002$ , CI= 0 1.22-2.62) were 1.8 times as likely to have had a Pap test as those Latinas with food security.

On inspection of the need-for-service, traditional construct, health status was associated with reporting Pap testing. Latinas who indicated their health was “fair/poor” were 1.6 times as likely ( $p < .001$ , CI= 1.30-20.5) to have had a Pap test as those who rated their health as “excellent”. Conversely, those Latinas who were considered overweight were half as likely to have ever had a Pap test (OR = 0.50,  $p < .001$ , CI= 0.43-.59).

The last construct examined was the health behavior, traditional construct. Time since the last doctor visit was a notable variable associated with the likelihood of receiving a Pap test. Not surprisingly, respondents who never had a doctor visit were significantly less likely (OR = 0.21,  $p < .001$ , CI= 0.11-.41) to have received a Pap test as those Latinas who had visited a doctor in the previous two years. Latinas in the interim group (last visit more than five years ago) had rates of testing (OR = 0.46,  $p = .001$ , CI=

0.29-.72) between the lowest and the highest groups. Interestingly, smoking status was an indicator of Pap testing. Latinas who had quit smoking were 3.4 times as likely to have received a Pap test as those who had never smoked while those who currently smoked were 1.5 times as likely ( $p=.04$ , CI= 1.02-2.15) to have received a Pap test in their lifetime.

Table 4.9 Bivariate logistic regressions\* estimating Pap testing among all Latinas age 18-85

Variable	Odds Ratio	p-value	CI Lower	CI Upper
<i>Predisposing Traditional</i>				
Age				
18-29	0.12	<0.001	0.08	0.18
30-39	0.79	0.328	0.49	1.27
40-49	0.84	0.502	0.50	1.40
50-59	R			
60-69	0.67	0.262	0.33	1.36
70 +	0.46	0.019	0.24	0.88
Marital Status				
Married	R			
Wid/Sep/Div / Living w/ Partner	0.75	0.075	0.55	1.03
Never Married	0.07	<0.001	0.06	0.09
Education Obtainment				
Less than 12 <sup>th</sup> Grade or HS Diploma	0.53	<0.001	0.43	0.66
12 <sup>th</sup> Grade or HS Diploma	1.45	0.001	1.18	1.78
More than HS	R			
Ethnicity				
Mexican	R			
Central American	1.2	0.157	0.92	1.66
Puerto Rican	0.89	0.712	0.48	1.65
South American	1.1	0.749	0.59	2.08
Other	1.3	0.279	0.82	1.96
2+ Latino Types	0.75	0.089	0.54	1.04
Family Type				
Single Adult, No Kids	0.16	<0.001	0.13	0.21
Single with Kids	0.09	0.003	0.07	0.12
Married, No Kids	0.54	0.003	0.36	0.80
Married with Kids	R			
Language Spoken at Home				
English	R			
Spanish	0.97	0.81	0.73	1.28
English & Spanish	0.66	0.001	0.51	0.85
Other	0.87	0.58	0.52	1.45
English Proficiency				
Very Well	R			
Well	0.64	<0.001	0.52	0.80
Not Well / Not At All	1.7	<0.001	1.43	2.14

Variable	Odds Ratio	p-value	CI Lower	CI Upper
<i>Predisposing, Vulnerable</i>				
Nativity				
Born in US	R			
< 5 yrs in US	0.71	0.019	0.53	0.94
>= 5 Yrs in US	1.7	<0.001	1.40	2.06
Years in the U.S.				
Born in US	R			
< 2 Year	0.36	<0.001	0.23	0.60
2-4 Years	0.92	0.672	0.64	1.33
5-9 Years	1.4	0.022	1.05	1.97
10-14 Years	1.5	0.006	1.12	1.92
15+ Years	1.9	<0.001	1.51	2.47
Citizenship				
U.S. born Citizen	R			
Naturalized Citizen	1.7	<0.001	1.30	2.22
Non-Citizen	1.4	0.001	1.15	1.70
<i>Enabling, Traditional</i>				
Annual Household Income				
\$ 0-10000	R			
\$ 10001-20000	1.4	0.004	1.12	1.86
\$ 20001-30000	1.6	0.001	1.22	2.05
\$ 30001-40000	1.3	0.075	0.97	1.86
\$ 40001-50000	1.6	0.027	1.05	2.39
\$ 50001 +	1.6	0.002	1.19	2.18
Have Health Insurance				
No	R			
Yes	2.0	<0.001	1.61	2.36
Have a Usual Source of Health Care				
No	R			
Yes	2.6	<0.001	2.10	3.11
<i>Enabling, Vulnerable</i>				
% of Federal Poverty Level				
0-99% FPL	0.67	0.003	0.52	0.87
100-199% FPL	0.74	0.019	0.58	0.95
200-299%FPL	0.67	0.005	0.50	0.89
300% FPL and Above	R			
Have Food Security				
Food Security	R			
Food Insecurity W/O Hunger	1.7	<0.001	1.27	2.18
Food Insecurity W/ Hunger	1.8	0.002	1.22	2.62
<i>Need, Traditional</i>				
Health Status				
Excellent/Very Good	R			
Good	1.1	0.265	0.91	1.39
Fair/Poor	1.6	<0.001	1.30	2.05
Ever Diagnosed with Cancer				
No	R			
Yes	1.1	0.688	0.71	1.66
Overweight				
No	R			
Yes	0.50	<0.001	0.43	0.59



Variable	Odds Ratio	p-value	CI Lower	CI Upper
<i>Health Behavior, Traditional</i>				
Last Doctor Visit				
Within The Last Year	R			
1 To 2 Years Ago	0.42	<0.001	0.33	0.54
2 to 5 Years Ago	0.33	<0.001	0.23	0.47
More Than 5 Years Ago	0.46	0.001	0.29	0.72
Never	0.21	<0.001	0.11	0.41
Smoking Status				
Currently Smokes	1.5	0.039	1.02	2.154
Quit Smoking	3.4	<0.001	2.30	5.04
Never Smoked Regularly	R			

\*Each variable in the theoretical model was measured individually in a logistic regression against the outcome, and results of these multiple analyses are combined in this table. R indicates reference group.

#### Phase Four: Multivariate Logistic Regression

The multivariate logistic regression model was built using the statistically significant variables from the bivariate analysis. The results of testing the model for receipt of a Pap test in one's lifetime are shown by theoretical construct in Tables 4.10-4.15. Table 4.10 illustrates the predisposing, traditional construct. The F statistic for this model is significant ( $F=49.69$ ,  $df= 17, 223$ ,  $p<.0001$ ) indicating at least one or more of the factors associated with Pap testing included in the model has a statistically significant effect on ever having had a Pap test. The model contained five factors (age, marital status, education achievement, ethnicity, and family type). Four of the independent variables (age, marital status, education achievement, and family type) had a statistically significant association with ever having a Pap test while controlling for the influence of the other variables.

In this multivariate analyses, the strongest factor associated with a Latina reporting a Pap test in her lifetime was having a 12<sup>th</sup> grade education or high school diploma. The odds that Latinas with a 12<sup>th</sup> grade education or high school diploma were 70% as likely ( $p=0.02$ ,  $CI= 0.55-.97$ ) to have ever had a Pap test in her lifetime as those

who had more than a high school education. In addition, the odds of ever having a Pap test are 22% ( $p < .001$ , CI= 0.14-.35) lower for 18-29 year olds than for women aged 50-59. Furthermore, the odds for those never married Latinas are even lower. Fifteen percent ( $p < .001$ , CI= 0.09-.25) of the Latinas who never married were as likely as married Latinas to have ever had a Pap test. While those married Latinas without children were less than half (OR, .41,  $p < .001$ , CI= 0.27-.63) as likely when compared to married Latinas with children.

Table 4.10 Model 1. Multivariate logistic regression estimating Pap testing with significant Predisposing, Traditional variables

Variable	Odds Ratio	p-value	CI Lower	CI Upper
Age				
18-29	0.22	<0.001	0.14	0.35
30-39	0.67	0.118	0.40	1.11
40-49	0.70	0.192	0.41	1.19
50-59	R			
60-69	0.63	0.223	0.30	1.32
70 +	0.58	0.094	0.29	1.10
Marital Status				
Married	R			
Wid/Sep/Div / Living w/ Partner	0.91	0.716	0.55	1.51
Never Married	0.15	<0.001	0.09	0.25
Education Obtainment				
Less than 12 <sup>th</sup> Grade or HS Diploma	0.61	<0.001	0.47	0.79
12 <sup>th</sup> Grade or HS Diploma	0.72	0.016	0.55	0.94
More than HS	R			
Ethnicity				
Mexican	R			
Central American	1.2	0.236	0.88	1.69
Puerto Rican	1.1	0.737	0.55	2.31
South American	0.92	0.782	0.50	1.70
Other	1.2	0.443	0.77	1.79
2+ Latino Types	1.3	0.181	0.89	1.82
Family Type				
Single, no kids	0.63	0.095	0.36	1.08
Single with Kids	0.53	0.017	0.32	0.89
Married, No Kids	0.41	<0.001	0.27	0.63
Married with Kids	R			

The predisposing, vulnerable construct model contained four factors associated with Pap testing (nativity, language spoken at home, English proficiency, and

citizenship) and is shown in Table 4.11. Three of the four independent variables had a statistically significant association ( $F=11.41$ ,  $df= 9$ ,  $231$ ,  $p<.0001$ ). There was a greater effect in the English proficiency category than in the language spoken at home category. Latinas who reported they spoke English “not well or not at all” was the strongest factor for a reporting a Pap test in her lifetime (OR, 2.5.,  $p<.001$ , CI= 1.80-3.65) when compared to those who spoke English very well. Yet in a contradictory result, Latinas who reported to speak English “well” were 74% ( $p=.04$ , CI= 0.57-.98) as likely

Table 4.11 Model 2. Multivariate logistic regression estimating Pap testing with significant Predisposing, Vulnerable variables

Variable	Odds Ratio	p-value	CI Lower	CI Upper
Nativity				
Born in US	R			
< 5 yrs in US	0.43	<0.001	0.29	0.64
>= 5 Yrs in US	1.4	0.017	1.06	1.84
Language Spoken at Home				
English	R			
Spanish	0.43	<0.001	0.28	0.65
Bilingual: English & Spanish	0.53	<0.001	0.40	0.71
Other	0.82	0.454	0.48	1.39
English Proficiency				
Very Well	R			
Well	0.74	0.035	0.57	0.98
Not Well / Not At All	2.5	<0.001	1.80	3.65
Citizenship Status*				
U.S. born Citizen	R			
Naturalized Citizen				
Non-Citizen				

\* This estimate was not reliable statistically, because there were too few observations

to have ever had a Pap test as those who speak English very well. Both bilingual Latinas and Spanish only speakers were approximately half as likely (OR=0.53,  $p<.001$ , CI= 0.40-.71 and OR=0.43,  $p<.001$ , CI .28-.65 respectively) to have had a Pap test in her lifetime as English only speaking Latinas.

Nativity was associated with Pap testing in that length of time in the U.S. increased the likelihood of Pap testing. Recent immigrants were less than half as likely (OR=0.43,  $p<.001$ , CI= 0.29-.64) as native-born Latinas to have ever had a Pap test. While established immigrants were 1.4 times as likely ( $p=.02$ , CI= 1.06-1.84) as native-born Latinas to have ever had a Pap test.

Table 4.12 represents the enabling, traditional construct. The F statistic for this model is significant ( $F=48.34$ ,  $df 2, 238=$ ,  $p<.0001$ ) and contained two factors associated with screening (insured and usual source of health care). Both independent variables had a statistically significant association with ever having a Pap test while controlling for the influence of the other variables. The strongest factor in this model was having a usual

Table 4.12 Model 3. Multivariate logistic regression estimating Pap testing with significant Enabling, Traditional variables

Variable	Odds Ratio	p-value	CI Lower	CI Upper
Health Insurance				
No	R			
Yes	1.5	<0.001	1.26	1.88
Usual Source of Health Care				
No	R			
Yes	2.1	<0.001	1.75	2.63

source of health care. Latinas with a usual source of health care were more than twice as likely to have had a Pap test in her lifetime as those who did not have a usual source of health care (OR=2.1,  $p<.001$ , CI= 1.75-2.63). What's more, Latinas who had health insurance were 1.5 times as likely (OR= 1.5,  $p<.001$ , CI= 1.26-1.88) to have ever had a Pap test as those who did not have health insurance.

The enabling, vulnerable construct is illustrated in Table 4.13. The model contained two factors associated with screening (federal poverty level and food security).

The F statistic for this model is significant ( $F= 10.01$ ,  $df = 5$ ,  $235$ ,  $p<.0001$ ), each independent variable had a statistically significant association with ever having a Pap test while controlling for the influence of the other variable.

The strongest factor for Latinas reporting a Pap test in their lifetime was reporting food insecurity. Those Latinas who reported food insecurity with hunger were 2.2 times as likely ( $p<.001$ ,  $CI= 1.46-3.27$ ) to have ever had a Pap test while those Latinas who reported food insecurity without hunger were 2 times as likely ( $p<.001$ ,  $CI= 1.54-2.65$ ) to have ever had a Pap test as those Latinas who reported food security. There was a poverty gradient associated with the rates of Pap test among Latinas. Those women in the

Table 4.13 Model 4. Multivariate logistic regression estimating Pap testing with significant Enabling, Vulnerable variables

Variable	Odds Ratio	p-value	CI Lower	CI Upper
FPL: ratio of family income to poverty level				
0-99% FPL	0.52	<0.001	0.40	0.68
100-199% FPL	0.63	<0.001	0.48	0.81
200-299%FPL	0.67	0.005	0.50	0.89
300% FPL and Above	R			
Food Security				
Food Security	R			
Food Insecurity W/O Hunger	2.0	<0.001	1.54	2.65
Food Insecurity W/ Hunger	2.2	<0.001	1.46	3.27

lowest FPL's were less likely ( $OR=0.52$ ,  $p<.001$ ,  $CI= 0.40-.68$ ) to have received a Pap test than those Latinas in the higher FPLs ( $OR=0.67$ ,  $p=.005$ ,  $CI= 0.50-.89$ ).

The next model examined the need-for-service, traditional construct (Table 4.14). This model contained three factors associated with screening (health status, overweight, and ever diagnosed with cancer). Two independent variables (health status and overweight) had a statistically significant association ( $F=18.65$ ,  $df=4$ ,  $236$ ,  $p<.0001$ ) with

ever having a Pap test while controlling for the influence of the other variables. Health status proved to have the greatest effect in this model. Individuals who reported a fair/poor health status were 1.4 times as likely ( $p=.005$ ,  $CI= 1.10-1.75$ ) to have ever had a Pap test in her lifetime as those who reported an excellent health status. Further, overweight Latinas were about half as likely ( $OR=0.52$ ,  $p<.001$ ,  $CI=0.45-.62$ ) to have had a Pap test as those who were not overweight.

Table 4.14 Model 5. Multivariate logistic regression estimating Pap testing with significant Need, Traditional variables

Variable	Odds Ratio	p-value	CI Lower	CI Upper
Health Status				
Excellent/Very Good	R			
Good	1.0	0.831	0.823	1.27
Fair/Poor	1.4	0.005	1.10	1.75
Overweight				
No	R			
Yes	0.53	<0.001	0.45	0.62
Ever Diagnosed with Cancer				
No	R			
Yes	1.1	0.644	0.71	1.72

The health behavior, traditional model contained two factors associated with screening (last doctor visit and smoking status) and the results of the data are shown in Table 4.15. The F statistic for this model is significant ( $F=20.41$ ,  $df= 6, 234$ ,  $p<.0001$ ). In the analysis the strongest factor for having a Pap test in their lifetime was Latinas who quit smoking ( $OR= 3.2$ ,  $p<.001$ ,  $CI= 2.19-4.80$ ) when compared to those who never smoked. Yet, when compared to Latinas who never smoked, those who currently smoked were associated with having a Pap test in their lifetime ( $OR= 1.5$ ,  $p=.03$ ,  $CI= 1.03-2.16$ ). Time since the last doctor visit had an interesting effect. Latinas who reported to have never seen a

doctor were the least likely to receive a Pap test (OR=0.21,  $p<.001$ , CI=0.11-.42) as those who visited the doctor within the last year. Whereas Latinas who visited a doctor more than 5 years ago and those who visited a doctor between 1 and 2 years ago were almost half as likely (OR=0.46,  $p=.002$ , CI=0.28-.75 and OR=0.43,  $p<.001$ , CI=0.34-.56 respectively) to have ever received a Pap test. In contrast, Latinas reporting a doctor visit between 2 to 5 years ago were about a third as likely to have had a Pap test (OR=0.34,  $p<.001$ , CI=0.23-.48).

Table 4.15 Model 6. Multivariate logistic regression estimating Pap testing with significant Health Behavior, Traditional variables

Variable	Odds Ratio	p-value	CI Lower	CI Upper
Last Doctor Visit				
Within The Last Year	R			
1 To 2 Years Ago	0.43	<0.001	0.34	0.56
2 to 5 Years Ago	0.34	<0.001	0.23	0.48
More Than 5 Years Ago	0.46	0.002	0.28	0.75
Never	0.21	<0.001	0.11	0.42
Smoking Status				
Currently Smokes	1.5	0.034	1.03	2.16
Quit Smoking	3.2	<0.001	2.19	4.80
Never Smoked Regularly	R			

#### Phase Five: Final Logistic Regression Model

The final logistic regression model was built using variables that were statistically significant in the construct logistic regression analyses. The results are shown in Table 4.16. The model contained 16 factors associated with screening (age, marital status, education achievement, family type, language spoken at home, English proficiency, nativity, insurance status, usual source of health care, poverty level, food security, health status, overweight, last doctor visit, smoking status, and survey year). The model was

statistically significant ( $F=23.11$ ,  $df=37$ ,  $203$ ,  $p<.0001$ ) with nine independent factors proving to have a statistically significant association with ever having a Pap test while controlling for the influence of the other variables. The strongest factor for a Latina reporting a Pap test in her lifetime was Latinas who quit smoking. Latinas who quit smoking were 2.1 times as likely ( $p<.001$ ,  $CI= 1.38-3.43$ ) to have ever had a Pap test in her lifetime as those who never smoked. And yet, Latinas who currently smoked were 1.8 times as likely ( $p=.003$ ,  $CI= 1.22-2.66$ ) to have ever had a Pap test in her lifetime as those who never smoked. While Latinas who had health insurance were 1.6 times as likely ( $p<.001$ ,  $CI=1.28-2.01$ ) to have ever had a Pap test in her lifetime as those who did not have health insurance. Having a usual source of health care had no effect on Pap test rates. Latinas who reported food insecurity without hunger were 1.6 times as likely ( $p=.005$ ,  $CI= 1.14-2.12$ ) to have ever had a Pap test in her lifetime as those who reported food security. Whereas, when compared to those who reported food security, there was no statistical significance among those who reported food insecurity with hunger. As expected time since immigration, age, education, marital status, family type, and time since the last physician visit were the variables that contributed the least to ever having a Pap test for Latinas in California. Recent immigrant Latinas were almost two thirds as likely ( $OR=0.60$ ,  $p=.02$ ,  $CI=0.39-.91$ ) as U.S.-born Latinas to have ever had a Pap test while there was no statistical significance associated with established immigrant Latinas. Latinas at each end of the age spectrum were less likely to receive a Pap test in their lifetime. Women between the ages 18-29 ( $OR=0.28$ ,  $p<.001$ ,  $CI=0.17-.46$ ) and those 70 or older ( $OR=0.32$ ,  $p=.002$ ,  $CI=0.16-.65$ ) were less likely to have a Pap test as those Latinas in the 50-59 age range. Latinas with less than a high school education were two-



thirds as likely (OR=0.66,  $p<.001$ , CI=0.55-.81) as those with more than a high school education to have received a Pap test in their lifetime. Single Latinas with children and married Latinas without children were about half as likely (OR=0.45,  $p=.003$ , CI=0.27-.76 and OR=0.41,  $p<.001$ , CI=0.27-.63 respectively) as married Latinas with children to have ever had a Pap test. Additionally, Latinas who never married were less than a quarter as likely (OR=0.15,  $p<.001$ , CI=0.09-.26) to be in receipt of a Pap test as those married Latinas. Latinas who responded they spoke English “well” were approximately two-thirds as likely (OR=0.63,  $p=.002$ , CI=0.47-.85) to have ever had a Pap test as those Latinas who responded they spoke English “very well”. Time since the last doctor visit progressively lessens the odds of having a Pap test. Latinas who reported to have never visited a doctor were just over a quarter as likely (OR=0.28,  $p=.002$ , CI=0.12-.63) to have received a Pap test. Whereas those who reported a doctor visit 1 to 2 years ago were nearly half as likely (OR=0.48,  $p<.001$ , CI=0.35-.65) as Latinas who had a doctor visit within the last year.

Table 4.16 Model 7. Multivariate logistic regression estimating Pap testing ,Final Model

Variable	Odds Ratio	p-value	CI Lower	CI Upper
Nativity				
Born in US	R			
< 5 yrs in US	.60	0.018	0.39	0.91
≥ 5 Yrs in US	1.0	0.918	0.76	1.35
Age				
18-29	0.28	<0.001	0.17	0.46
30-39	0.76	0.310	0.45	1.29
40-49	0.73	0.285	0.42	1.29
50-59	R			
60-69	0.59	0.182	0.27	1.28
70 +	.032	0.002	0.16	0.65
Marital Status				
Married	R			
Wid/Sep/Div / Living w/ Partner	0.90	0.686	0.54	1.50
Never Married	0.15	<0.001	0.09	0.26
Educational Obtainment				
Less than 12 <sup>th</sup> Grade or HS Diploma	0.66	<0.001	0.55	0.81

Variable	Odds Ratio	p-value	CI Lower	CI Upper
12 <sup>th</sup> Grade or HS Diploma	0.82	0.094	0.64	1.04
More than HS	R			
Family Type				
Single, no kids	0.63	0.90	0.36	1.08
Single with Kids	0.45	0.003	0.27	0.76
Married, No Kids	0.41	<0.001	0.27	0.63
Married with Kids	R			
Language Spoken at Home				
English	R			
Spanish	0.78	0.229	0.51	1.17
English & Spanish	0.86	0.342	0.64	1.17
Other	0.98	0.950	0.53	1.83
English Proficiency				
Very Well	R			
Well	0.63	0.002	0.47	0.85
Not Well / Not At All	1.0	0.999	0.68	1.46
Health Insurance				
No	R			
Yes	1.6	<0.001	1.28	2.01
Usual Source of Health care				
No	R			
Yes	1.2	0.204	0.91	1.53
FPL				
0-99% FP	0.85	0.373	0.60	1.21
100-199% FPL	0.89	0.425	0.66	1.19
200-299% FPL	0.83	0.244	0.61	1.13
300% FPL and Above	R			
Food Security				
Food Security	R			
Food Insecurity W/O Hunger	1.6	0.005	1.14	2.12
Food Insecurity W/ Hunger	1.6	0.084	0.94	2.55
Health Status				
Excellent/Very Good	R			
Good	1.2	0.183	0.93	1.48
Fair/Poor	1.2	0.303	0.87	1.57
Overweight				
No	R			
Yes	0.85	0.114	0.70	1.03
Last Doctor Visit				
Within The Last Year	R			
1 To 2 Years Ago	0.48	<0.001	0.35	0.65
2 to 5 Years Ago	0.38	<0.001	0.25	0.58
More Than 5 Years Ago	0.36	0.001	0.20	0.66
Never	0.28	0.002	0.12	0.63
Smoking Status				
Currently Smokes	1.8	0.003	1.22	2.66
Quit Smoking	2.1	0.001	1.38	3.43
Never Smoked Regularly	R			
Survey Year				

Variable	Odds Ratio	p-value	CI Lower	CI Upper
2001	R			
2003	0.99	0.924	0.79	1.24
2005	0.72	0.004	0.57	0.90

\* This estimate was not reliable statistically, because there were too few observations

## CHAPTER FIVE

### Discussion

This study applied the Behavioral Model for Vulnerable Populations, a leading theoretical model to help explain health care access and utilization of vulnerable populations, to examine the Pap testing trends and practices of Hispanic women in California. This research presents a gap in cancer prevention, specifically, cervical cancer screening, among both immigrant and U.S. - born Latinas living in California. This study determined there was an overall decline of 3% by Latinas reporting a Pap test in their lifetime. While the overall trend for cervical cancer screening in the U.S. has also declined, a report by the Center for Disease Control indicates the decline for Latinas between 2003 and 2005 is less than 1% (Centers for Disease Control and Prevention, 2008a). Thus, the rate of decline in screening for California's Latinas is 3 times the national average. This would indicate a need for targeted interventions to encourage Pap testing among Latinas in California.

Several of the predisposing variables were significant factors associated with screening of the receipt of a Pap test among Latinas. Overall, this study confirmed that Latinas in California, especially recent immigrants have low rates of Pap testing. The data documented that approximately 87% of U.S.-born, 83% of recent immigrant, and 92% of established immigrant Latinas in California had ever had a Pap test in their lifetime. This analysis is consistent with earlier studies showing disparities in screening rates between U.S.-born and immigrant Latinas. Similar to these findings, results from a study that assessed cervical cancer screening among foreign-born women in the U.S. established foreign-born women were more than three times as likely to have never had a

Pap test as U.S.-born women (Rodriguez et al., 2005; Tsui et al., 2007). With respect to women who received a Pap test within the previous three year, 83% of U.S.-born, 81% of recent immigrants, and 88% of established immigrant had done so. This averages to 85.5% and is far below the Health People 2010 goal of 97% of eligible women to ever have a Pap test and 90% for a Pap test within the past 3 years (California Department of Public Health, 2007).

Another significant finding that requires attention is the length of time a Latina has spent in the U.S. Latinas with less than five years in the U.S. were less likely to have received a Pap test than either U.S.-born Latinas or those with five or more years in the U.S. This may be explained in part by documentation status. Undocumented Latinas may be less likely to access the health care system. Prior research has shown the rates of undocumented Hispanics use of the health care system was much lower than all other Hispanics or the nation overall (Berk, Schur, Chavez, & Frankel, 2000). Additionally, this may be due to a lack of knowledge concerning Pap testing and health beliefs retained from their country of origin. Watkins et al. (2002) interviewed 97 women in rural Mexico. Of the group, 66% of the women had never had a Pap test. One of the most frequent reasons reported was the lack of knowledge and beliefs about Pap testing. It is possible new immigrants retain the health beliefs from their home countries and as they are in the U.S. longer they become more self-empowered in caring for themselves.

Of greater concern, the youngest, and the oldest women were the least likely to have ever had a Pap test when compared to women in their 50's. Specifically, younger Latinas between the ages of 18-29 were about a quarter as likely to have received a Pap in their lifetime, while women 70 and older were two-thirds as likely. Lower rates of Pap

testing among younger women is well documented (Byrd et al., 2004). Since the ACS guidelines state cervical cancer screening starts three years after a woman becomes sexual or at age 21, these findings emphasize the need for interventions among this group of women.

Examination of the data indicates a statistically lower rate of Pap testing among women 70 years and older. Approximately two-thirds of the oldest women were as likely to have had a Pap test as those women aged 50-59. Yet, a low screening rate in this age group is documented in prior studies. This finding is consistent with a study of 452 Mexican-American women from three southeast Texas counties. Randolph et al. (2002) found only 54% of Hispanic women aged 66-74 had a Pap test within the past three years. The exponential age-related incidence of cervical cancer in women 50 and older advocates for increased screening in older women. In a study analyzing thirteen U.S. cancer registries from 1992-2003 the rates of both cervical cancer and squamous cell cancer peaked for Hispanics in the 60-69 age group (McDougall, Madeleine, Daling, & Li, 2007). These findings point to a significant disparity in cancer control among older Latinas who are in double jeopardy.

Findings also indicated that women's marital and offspring status influenced screening. Women who never married, those who married but did not have children, and those who were single with children were not as likely to have ever received a Pap test. Some of these findings are inconsistent with previous research. While a statistical brief put out by the Agency for Healthcare Research and Quality indicates women who never married were nearly twice as likely to have never had a Pap test (Soni, 2007), other research suggests women with children were more likely to have been screened. A study

conducted in rural Mexico found women who delivered children were significantly more likely to have received a Pap test (Watkins et al., 2002). Perhaps women with children have more exposure to Pap testing as a result of having prenatal care during their pregnancies. They may have more experience with health care professionals, and may feel more comfortable using the health care system in the course of their prenatal care.

Previous studies have documented patients who are not proficient in English are less likely to receive preventive health services. However, findings from this study suggested Latinas who reported they spoke English “not well/at all” were as likely to receive a Pap test as a women who spoke English “very well”. This study found those who reported they spoke English “well” were significantly less likely to have ever received a Pap test in their lifetime. Perhaps women in this study over reported their ability to speak English. Prior research has found physicians are less likely to recommend a Pap test to women with low English proficiency. In addition, prior research has shown women who may rely on a friend or family member to interpret may be reluctant to place themselves in a vulnerable position and participate in an examination to obtain a Pap test (De Alba & Sweningson, 2006; Jacobs et al., 2005).

Another aspect of the results that deserve further discussion is the effect of the enabling characteristics on the outcome. Latinas most likely to have ever had a Pap test were those who reported a usual source of health care and health insurance. The findings support prior research indicating the availability and affordability of health services remains the core factors significantly associated with obtaining a Pap test among Latinas. The relationship of the enabling characteristics (availibility and affordability) with having a Pap test is an especially crucial finding, given that Latinas are more likely than their

white counterparts to be poor, lack health insurance, and report no usual source of health care. In two prior studies, researchers found a strong association between having health insurance and a usual source of care and cervical cancer screening (Ana F. Abraido-Lanza, Chao, & Gammon, 2004; Selvin & Brett, 2003). Moreover findings from this study indicated Latinas who reported food insecurity were more likely to have received a Pap test in their lifetime. This may reflect a unique pattern among Latinas. Individuals with lower incomes may qualify for programs that offer free or low-fee screenings. Whereas those with higher incomes may not qualify for these programs and might possibly forgo cancer screenings due to the cost.

This study found Latinas who reported “fair/poor” health were more likely than those reporting “excellent” health to have received a Pap test during their lifetime. Moreover, findings from this study indicated overweight Latinas were less likely to have ever had a Pap test. However, once the need factors were introduced in the final logistic regression model, the significance of health and weight status no longer contributed toward the prediction of Pap testing practices. This finding for health status is consistent with other studies (L. E. Fernandez & Morales, 2007; Gorin & Heck, 2005). Although health status has a long history in health service research, this factor has received minimal attention (Hiatt et al., 2002). Furthermore, although overweight and obese women are at great risk of developing cervical cancer, (McCullough et al., 2008) there is little available literature on the effect of a women’s weight and the receipt of a Pap test. One study analyzed 11,435 women who responded to the “Year 2000 Supplement” of the 1994 National Health Interview Survey. The researchers found overweight and obese women were less likely to report Pap testing even after adjusting for known barriers to



care (Wee, McCarthy, Davis, & Phillips, 2000). Another study analyzed 78,533 respondents from the 1998 Behavioral Risk Factor Surveillance Survey reported a direct association between Body Mass Index and delays in cancer screening after controlling for age, smoking, and health insurance status (Fontaine, Heo, & Allison, 2001) . Consequently, further research is warranted on the predictive importance of the health and weight status and Pap testing in Latinas.

The practice of the health behavior factors, the importance of recent contact with a physician, emerged as a strong and consistent finding. Findings from this study suggest a progressive decline in receipt of a Pap test the greater the length of time since the last physician's visit. This may be due to one of several reasons. In a study of low-income, minority, and immigrant women in a safety net system, Owusu et al. (2005) found women with competing needs (food, housing, clothing) were significantly less likely to participate in preventive screenings. In this study, 60% of Latinas had at least one child in the household with an annual household income of less than \$40,000. In California, the medium annual income is \$55,864 ((The Kaiser Family Foundation, 2007)). This makes Latinas poorer as a group. Latinas may have to work more than one job to provide for their family. Hence, they may put off seeing a physician on a regular basis. Another study documented lack of satisfaction with the health care system. Borders et al. (2003) sampled 675 women in Texas to determine if satisfaction with medical care influenced patient behavior. Women who rated the overall quality of their health care as excellent had greater odds of receiving cancer screenings, including Pap testing. Thus, women in this sample may have a lower feeling of satisfaction with their health care system and forgo seeing a physician unless it is necessary. Finally, many Latinas who do not perceive

themselves as sick do not feel it necessary to visit a doctor. Researchers found Latinas defined illness in terms of pain or dysfunction. Women reported they endured symptoms until they could no longer tolerate them before they sought health care (Boyer, Williams, Callister, & Marshall, 2001). This belief suggests the need for prevention education programs sensitive to the needs of both the less acculturated Latina.

This study found the smoking status of Latinas had a significant effect on the receipt of a Pap test. The association between smoking and Pap testing suggests that, independent of all other factors, smoking is an important indicator of cervical cancer screening. While Latinas who currently smoked were 1.8 times as likely to have ever received a Pap test, women who quit smoking were 2.1 times as likely. This finding is consistent with other studies (Clark, Rakowski, & Ehrich, 2000; Rakowski, Clark, & Ehrich, 1999). This could indicate those who quit smoking are committed to practice a healthier lifestyle, which includes cancer screening. However, smoking status may provide an indication for health care practitioners to identify those individuals who may be less likely to participate in cancer screenings.

Finally, while not statistically significant in the final logistic regression model, this study found Latinas who were overweight were less likely to have received a Pap test in their lifetime. This study found overweight women were half as likely to have ever received a Pap test. Overweight Latinas may be more reluctant to request a Pap test due to an increase in physical discomfort. Health care providers may delay Pap testing due to difficulties performing pelvic exams in obese women (Ferrante, Chen, & Jacobs, 2006). Further research is needed which investigate barriers to Pap testing of obese women is needed in order to develop appropriate interventions.

## Conclusion

Overall this study found that among the three groups, U.S.-born, recent immigrants, and established immigrants, lifetime use of Pap testing was lowest among the recently immigrated Latinas, controlling for other known factors associated with screening. This finding demonstrates the importance of targeting recent Latina immigrants to increase the use of cervical cancer screening. However, the trend for both native Latinas and established immigrants indicates a decline in Pap testing rates which suggests a need for health professionals to target all Latinas, regardless of immigration status to increase the rate of Pap testing among this vulnerable group. Further research is needed in this area to create a better understanding and to devise appropriate intervention methodologies.

The theoretical model used for this study, with its emphasis on economic as well as social and psychological factors, appears to fit the data well and address the relevant explanatory factors. Given the significance of recent contact with a health care provider to participation in cancer screenings among Latinas, inclusion of factors that measure physician supply may increase the predictive power of future models.

This study found a strong association between health insurance and screening. This suggests that efforts to provide the underserved with health insurance that includes prevention care may help increase cancer screening among the underserved. However, a more effective approach may be the direct delivery of preventive health services. Yet, in a small subset of the sample, it was found the majority of Latinas had not received a recommendation for a Pap test from a physician. Therefore, providing interventions to health care providers who work in Latina communities that includes recommendations

for cancer screenings is necessary. Finally, identifying the smoking status of Latinas is important due to the significant relationship between smoking status and Pap testing. Therefore, targeting interventions to health care providers to identify the smoking status may help to increase Pap testing practices among this population.

A strength of this study is that it relies on a large sample of California's Latinas and the interviews were conducted in both English and Spanish. However, this study has several limitations. First, the CHIS survey data is cross sectional and not longitudinal. This does not allow for cause and effect conclusions to be drawn. Therefore, only the effect of immigration on Pap testing can be studied and not the process of acculturation to this society's norms. Although a comparison between cohorts provides some insight into the Pap testing practices of Latinas, the conditions related to each group are unique to each cohort. A longitudinal study would address this issue, but this type of study does not yet exist. Next, the CHIS sample is drawn from the households of related persons with access to a landline telephone in the civilian, non-institutionalized population of California. Those individuals who live in group quarters of unrelated adults or are without residential telephones, common conditions among recent immigrants and the poor, are excluded. The data is based on self-report and is subject to self-reporting bias. Women reporting on cancer screening may have provided answers they deemed more socially acceptable which may lead to over-reporting. In addition, women with limited language proficiency or knowledge on cancer screening may be less likely to remember a discussion regarding Pap testing with their health care provider. Finally, this study examined the practices of Latinas residing in California using data collected by the CHIS. This does not allow generalizations to be made to other states or populations.

### Future Research

This study is a first attempt to better understand the correlates of Pap testing among California's Latinas. The shortcomings are recognized and a recommendation would be that future research includes more subjective measures of cervical cancer screening practices. However, this study leads the way for future studies examining cervical cancer screening behaviors in an underserved population and may assist in identifying vulnerable populations who are at risk of not receiving appropriate cervical cancer screenings.

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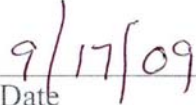
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