Health Care Access and Utilization among Hispanics Living in New vs. Established Destinations: Examining the Moderating Role of Rurality

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Abstract

We used six years of individual-level data from Hispanic respondents from the Behavioral Risk Factor Surveillance System merged with county-level data from the Area Resource Files to examine differences in health care access and utilization among Hispanics living in new vs. established Hispanic destinations with a particular focus on the role of rurality (county size and adjacency to metropolitan areas) in moderating those differences. We found that Hispanics in the newest new destinations (those that did not achieve new destination status until 2000) are the most likely to have health insurance and a personal doctor and most likely to have obtained a physical health checkup in the past two years but that the advantage of living in a recent new destination is significantly diminished if it is a small non-metropolitan county. The nonmetropolitan disadvantage among Hispanics was explained not by contextual and resource characteristics of nonmetropolitan counties themselves, but by the individual-level resource characteristics of Hispanics living in those counties.

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Introduction

The unprecedented Hispanic population growth and geographic dispersion of Hispanics from traditional settlement areas in the US southwest to new destinations in the Midwest, southeast and Pacific northwest over the past 20 years is now well-established in the demographic and sociological literatures (Goeveia and Saenz 2000; Kandel and Cormartie 2004; Lichter and Johnson 2006; Murillo and Villenas 1997; Singer 2008; Suro and Singer 2002). Hispanic immigrants arriving to the US in the late 1990s as well as previous generations of Hispanics who had initially settled in urban areas of the southwest have been drawn to a soaring economy bolstered by growth in "new economy" jobs in construction, manufacturing, meat packing, and the service sector, leading to massive Hispanic population growth in small towns and rural areas (Singer 2008). Although established destinations still report the largest populations of Hispanics in terms of absolute numbers, new destinations with small bases in the 1970s and 1980s have experienced the fastest Hispanic growth rates (Suro and Singer 2002), and many nonmetropolitan areas of the US with historically non-existent or very low Hispanic populations have experienced massive influxes of Hispanics. As of 2010, over 3.8 million Hispanics lived in nonmetropolitan counties, representing an increase of 138% since 1990 (US Census Bureau 1990, 2010).

Researchers are increasingly examining the effects of this major demographic shift on various individual level outcomes among Hispanics (Stamps and Bohon 2006), as well as the macro-level economic and social outcomes on the new destination communities themselves (Singer 2004; Johnson and Lichter 2008; Crowley and Lichter 2009; Adelman et al. 2010). It is clear from existing research and a basic descriptive comparison of new vs. established Hispanic

destinations that new destinations are quite different from established gateways in a number of important ways, including the availability of familial, social, and advocacy networks (Portes and Stepick 2003), the quality and affordability of housing (Atiles and Bohon 2002; Atiles and Bohon 2003), the response of the local receiving area to the new demographic makeup (Singer 2004), the socioeconomic well-being of residents, and the availability of infrastructure and resources necessary to successfully absorb a growing Hispanic population, many of whom have limited English proficiency (Singer 2004; Stamps and Bohon 2006).

One of the surprisingly understudied areas in which destination type may impact Hispanics is health care access and utilization. Access to health care is an important material determinant of social positioning in a stratified society. Hispanics living in the US face key challenges when it comes to accessing health care services, including obtaining health insurance, locating quality services, and communicating with medical providers (Derose et al. 2009; Escarce 2007; Kapur and Escarce 2006; Lees et al. 2005). The extent to which Hispanics can successfully access and utilize health care services in the US is particularly important to US population health due to increasing Hispanic population size and their geographic dispersion across the US. About one-third of Hispanics in the US are currently uninsured, the highest rate among all major racial/ethnic groups. While individual-level resource characteristics, such as socioeconomic status and English proficiency, clearly contribute to these disparities, research demonstrates that *where* Hispanics live plays a key role in explaining lack of access to and underutilization of health care services (Gresenz et al. 2009; Gresenz et al. 2012; Kirby et al. 2006).

To date, the existing research on differences in health care access and utilization among Hispanics living in new vs. established destinations, though important, has been predominantly qualitative in nature (Blewett et al 2003; Casey 2004) or has focused on one particular subgroup of Hispanics (Gresenz et al. 2012) or one specific geographic area of the US. Further, this research has not differentiated between recent new vs. mature new destinations and has not examined the ways in which health care access and use may differ within and across metropolitan and nonmetropolitan areas. Accordingly, the present research seeks to answer the following research questions using nationally representative data collected from Hispanic adults: 1) Are there differences in health care access (health insurance coverage and access to a personal doctor) and utilization (routine physical health checkup in the past two years and obtaining a flu shot in the past year) between Hispanics living in established vs. new destinations, and do these differences vary by the timing and speed of the new destination development? 2) To what extent does rurality (county population size and adjacency to metropolitan areas) moderate differences in health care access and utilization among Hispanics living in new vs. established destinations? and 3) Are these variations explained by differences in individual-level resource characteristics of Hispanics living in different destination types or by the socioeconomic and health care resource characteristics of the different destinations themselves?

This study makes a substantial contribution to our understanding of the factors that influence differences in health care access and utilization among Hispanics living in new and established destinations and provides insight into the role of rurality in moderating those differences. It is the first study to use a large nationally representative sample of Hispanics in both urban and rural areas to assess multiple measures of health care access and utilization, to differentiate new destinations by metropolitan status *and* the timing and speed of their Hispanic

population growth, and to explore the extent to which any observed differences in health care access and use across destinations can be explained by differences in individual-level Hispanic resource characteristics, differences in the health care market, and/or differences in the sociodemographic characteristics of the destinations themselves.

Conceptual Framework

We draw on the Behavioral Model of Health Care Access and Utilization (Andersen 1968; Andersen and Newman 1973; Andersen 1995; Davidson et al. 2004) to frame our analysis. The Andersen model considers the importance of individual-level health need factors (e.g., self-rated health, diseases, functional limitations), predisposing factors that are associated with individuals' preferences for health care or attitudes toward seeking care (e.g., age, gender, family status, race/ethnicity), and both individual-level and contextual-level enabling factors that facilitate or inhibit an individual's use of care. Such factors include socioeconomic status characteristics, health insurance coverage, English language proficiency, health care supply, and socioeconomic, demographic, and public policy environments where an individual lives.

Hispanic Health Care Access and Utilization

Disparities in access to and utilization of health care among Hispanics are well-established. Hispanics are less likely than whites to have health insurance and a usual source of care, make fewer ambulatory visits to physicians, and are less likely to obtain screenings for various cancers, cholesterol, and blood pressure. Hispanics face a number of individual-level financial and non-financial impediments to obtaining timely and quality health care, including lower socioeconomic status, lack of health insurance, language barriers, and limited knowledge

of when, why, and where to obtain services (Cristancho et al. 2008). However, the Hispanic disadvantage in health care access and utilization often remains even after controlling for these individual characteristics (Derose and Baker 2000; Escarce 2007; Kirby et al. 2006; Weinick et al. 2004; Zuvekas and Taliaferro 2003).

Medical sociologists, demographers, and public health scholars are increasingly focusing on the ways in which the social, economic, and physical environments in which we live and work play important roles in explaining disparities in health care access and use of health care services and how access and health care use are related to health outcomes. A number of researchers have examined a wide range of contextual correlates of Hispanic health disparities. For example, Kirby et al. (2006) found that a large proportion of Hispanic-white disparities in health care use are attributable to neighborhood racial/ethnic composition, and Haas et al. (2004) found that Hispanics living in neighborhoods with a greater prevalence of Hispanics experienced fewer barriers to receiving medical care compared with those living in neighborhoods with fewer Hispanics. Gresenz et al. (2009) similarly found that living in an area with a relatively high concentration of Spanish speakers or Hispanic immigrants was positively associated with access to health care among Mexican immigrants but inversely associated with access to care among U.S.-born Mexicans.

New vs. Established Hispanic Destinations

The importance of contextual factors and individual-level resource characteristics in influencing access to and use of health care services suggests that health care experiences of Hispanics in new destinations may be substantially different from those in established/traditional destinations. To date, only a handful of studies have examined differences in health care access

and utilization among Hispanics in new vs. established destinations, finding considerable barriers to health care access and unmet health care needs among Hispanics in new destinations compared to those in established destinations (Blewett et al. 2003; Casey 2004). Cunningham et al. (2006) found that Hispanics in new destinations are significantly less likely than those in established destinations to have health insurance, have a usual source of care, live near a community health center or safety net hospital, or to have had a physician visit in the past year (Cunningham et al. 2006). Similarly, Gresenz et al. (2012) found that compared with living in destinations with well-established Hispanic populations, US born Mexicans living in new destinations were more likely to experience an unmet health care need and reduced satisfaction with health care services. In in-depth interviews with new Hispanic settlers in southeast Michigan, Harari et al. (2008) found that these new residents were often unaware of local public health programs and experienced a wide range of barriers to health care utilization, including lack of health insurance, language barriers, feelings of not being welcome, perceived inferiority of health care for the uninsured, and isolation in their new neighborhoods.

Issues in Rural Health Care Access and Utilization

The disadvantage that Hispanics face in accessing and utilizing health care in new destinations relative to established gateways may be exacerbated for Hispanics living in rural areas. Many rural communities with previously non-existent or very small Hispanic populations have experienced unprecedented Hispanic population growth over the past 10-20 years. Rural health care systems, already under-resourced before this population growth, are being challenged to provide health care for these new population with traditionally low rates of insurance coverage, limited financial resources, language barriers, and special health care needs. Hispanics

are the fastest growing population in rural areas of the US (Kandel 2005) with growth rates of between 120% and 416% between 1990 and 2000 (Kandel and Cromartie 2004). Many disparities in health care access and utilization among Hispanics can be explained by lack of health insurance, low income, and language and cultural barriers – difficulties faced by urban and rural Hispanics alike. However, access problems among rural Hispanics are also the result of larger systemic problems in the rural health care infrastructure, including physician shortages, lack of bilingual health professionals, and reluctance of physicians to participate in Medicaid programs (Strickland and Strickland 1996; Woodridge et al. 2003). Physician shortages also put pressure on doctors to spend less time with patients and to avoid patients who need interpreters because those visits take longer (Casey et al. 2004). In addition, Hispanics in rural areas often face transportation barriers that are less likely among metropolitan Hispanics (Coronado et al. 2004). For all these reasons, we would expect that residences in a non-metropolitan county, particularly a county that is not adjacent to a metropolitan area would exacerbate health care access and utilization disadvantages among Hispanics in new destinations who are already at increased risk of experiencing barriers to health care.

Data and Methods

We use data from the 2006-2011 Behavioral Risk Factor Surveillance System (BRFSS), an annual cross-sectional telephone survey conducted by the Centers for Disease Control (CDC) and all U.S. states to collect information on health outcomes and behaviors, health care utilization, and demographic characteristics among the civilian, non-institutionalized household population. The BRFSS is the largest telephone-based health survey in the world, interviewing approximately 400,000 adults annually. One adult (aged 18 and older) per household is randomly

selected for the interview. The comparability of survey questions across the six years allows pooling the data to ensure large enough sample sizes for Hispanics in the most remote rural counties. We selected data from 2006 onward because several of the variables were not available prior to 2006. The sample is restricted to Hispanics only. We ran supplemental analyses (provided in a supplement for reviewers only that will be removed if the manuscript is accepted for publication) that indicated different results for non-Hispanic whites for all of our dependent variables. Destination type, rurality, and particularly the interactions between the two did not have the same associations with health care access and utilization for non-Hispanic whites as for Hispanics. Accordingly, we are confident that our results demonstrate specific relationships between destination type, rurality, and health care access and utilization for Hispanics that do not exist for non-Hispanic whites.

We merged the individual level Hispanic data with county-level data from the 2011-2012 release of the Area Resource File by county FIPs code (HRSA 2012). The Area Resource File contains an array of demographic, economic, and health care supply variables for all 3,141 counties in the U.S. compiled from various sources, including the decennial US Censuses, the American Community Survey 5-year estimates, the Bureau of Economic Analysis, the American Medical Association Physician Masterfile, the American Academy of Physician Assistants, and the American Hospital Association's Annual Survey of Hospitals.

Measures

Health Care Access and Utilization

We examine two measures of health care access and two measures of health care utilization. Health care access is measured with *health insurance status* and *access to a personal*

doctor. The BRFSS asks respondents to indicate whether they have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare. Unfortunately, respondents are not asked to identify their specific form of health care coverage. Accordingly, health insurance coverage is a binary variable coded '1' if the respondent has coverage and '0' if s/he does not. Access to a personal doctor is measured with a binary variable that indicates whether the respondent has at least one person who s/he thinks of as his/her personal doctor or health care provider. Health care utilization is measured with a binary variable indicating whether the respondent *received a routine physical health check up within the past two* years and a binary variable indicating whether the respondent *obtained a flu shot in the past year*. While a routine physical health checkup is a relatively standard measure of health care utilization, the flu shot is not typically considered in literature on disparities in health care access. Flu shot utilization is important to examine in research on Hispanics and new destinations given the prevalence of employer-provided vaccinations in workplaces with high percentages of Hispanic workers. Although a routine physical health checkup is something for which most people must take time away from work and must travel to obtain, many employers with large percentages of Hispanic workers now bring the flu shot directly to the employee and even mandate vaccination as a way to prevent lost productivity due to widespread illness. Although the data do not allow us to isolate cases where this happened, we suspected that flu shots would be more likely among Hispanics living in new destinations where meat processing plants and large farms are more prevalent.

Destination Type

Previous studies have categorized Hispanic destinations at several levels of geography, including regions (Saenz 2004; Crowley et al. 2006), states (Massey and Capoferro 2008), metropolitan statistical areas (Galvan 2013; Stamps and Bohon 2006), suburbs (Singer 2004), counties (Kandel and Cromartie 2004; Donato et al. 2007), consolidated public use microdata areas (Lichter and Johnson 2009), and place (Parisi and Lichter 2007). We chose to use counties as our contextual unit of analysis for two important reasons. First, the county is a unit small enough to reflect local social, economic, and political conditions, but also large enough to be meaningful for social policy (McLaughlin et al. 2001) and health care intervention efforts given that state-level funding for public health programs tends to be distributed at the county level through second order devolution processes. Second, county governments provide political and economic structure, and for many remote rural counties, the county represents the context within which most social and health services, including health care, are delivered (McLaughlin et al. 2001; McLaughlin and Stokes 2002).

We created three Hispanic destination categories: *established destinations*, *mature new destinations*, and *recent new destinations*. Based upon previous research (Lichter and Johnson 2009) established destinations are those that had a Hispanic population of at least 10% in 1990. Mature new destinations are defined as those experiencing Hispanic population growth of at least 150% and at least 1,000 Hispanics between 1990 and 2000 with one caveat. Because nonmetropolitan counties, by definition, have small populations, a requirement of an absolute increase of 1,000 Hispanics might be unreasonable in the smallest rural counties, and in using that criterion, many rural counties with substantial Hispanic population growth would not be captured in the new destination category, potentially biasing the results. For example, Hamilton

County, KS had a population of only 2,388 in 1990 with only 139 Hispanics who represented just 5.8% of its population. By 2000, the overall population had increased to 2,670 with 550 Hispanics representing over 20% of the county's population. In fact, without Hispanic population growth, the county would have experienced overall population decline, a common theme in small nonmetropolitan counties. Accordingly, we have modified the typical definition of new destinations to include counties that did not have an absolute increase of 1,000 Hispanics between 1990 and 2000 but that did meet the percent Hispanic growth measure of 150% *and* had a Hispanic population of at least 10% in 2000. The cutoff of 10% was chosen based upon the definition for established destinations, but we tested models at cutoffs of 15% and 20%, and the results were not markedly different. Recent new destinations are those that experienced slower or later Hispanic population growth. These are counties that did not yet meet the definition of a new destination in year 2000, but by 2010, they had experienced Hispanic population growth of at least 150% and 1,000 Hispanics or Hispanic population growth of 150% with an overall Hispanic population of at least 10% as described above. We present sample sizes of individual Hispanics and number of counties for each county type (i.e., destination type and rurality type) in Appendix A.

Rurality

County rurality was measured with county size and adjacency to a metropolitan area using the USDA's Economic Research Service rural-urban continuum codes (USDA ERS 2003). Each county in the US is assigned one of nine codes that reflect population density and urban influence. For the purposes of this research, we combined the three metropolitan categories into one group that we defined as *metropolitan counties*. Non-metropolitan counties were split into

large nonmetropolitan (those with an urban population of 20,000 or more) and *small/medium nonmetropolitan* (those with an urban population of 20,000 or less). Although the ERS breaks nonmetropolitan counties down further into those with an urban population of 2,500 to 19,999 vs. those with an urban population less than 2,500, we had to combine the medium and small nonmetropolitan counties to ensure large enough county sample sizes in each of our Hispanic destination categories. Finally, we identified whether the county was adjacent to a metropolitan area. Accordingly, we had five rurality categories: 1) metropolitan, 2) large non-metropolitan adjacent to metropolitan area, 3) large non-metropolitan not adjacent to metropolitan area, 4) small/medium nonmetropolitan adjacent to metropolitan area, and 5) small/medium nonmetropolitan not adjacent to metropolitan area (i.e., remote rural). For ease of interpretation, we will refer to the counties that are not adjacent to metropolitan areas as 'remote' throughout the paper.

Individual and Contextual Mediators

Individual level resource characteristics included *household income* (less than $25,000 per year, $25,000-49,999, and $50,000 or more), *educational attainment* (less than high school, high school graduate or come college, and four year college graduate), *employment status* (employed vs. unemployed), and *English language proficiency* (completed the survey in Spanish or English). Unfortunately, the BRFSS does not include measures of citizenship, immigrant generation, or length of time spent in the country, making it difficult to assess the role of acculturation on health care access and use. Accordingly, we use English language proficiency as a proxy for these measures. Preferred language is a commonly used measure of acculturation because it is strongly correlated with citizenship status, time spent in the US, and immigrant

generation (Cunningham et al. 2006; Deyo et al. 1985; Marin 1992). For our models examining health care utilization, we also control for health insurance status and access to a personal doctor.

We examine several county-level economic and demographic characteristics and health care supply characteristics from the Area Resource File (ARF) as potential mediators. County-level economic characteristics include: *median household income* (2005-2009 ACS estimates), *percent high school graduates* (2005-2009 ACS estimates), a binary variable indicating whether the county is a *persistent poverty county* (defined by the ARF as 20% or more of residents were poor in 1970, 1980, 1990, and 2000), a binary variable indicating whether the county is *farming dependent* (defined by the ARF as either 15% or more of average annual labor and proprietors' earnings were derived from farming during 1998-2000 or 15% or more of employed residents worked in farm occupations in 2000), a binary variable indicating whether the county is *services dependent* (defined by ARF as 45% or more of average annual labor and proprietors' earnings derived from services during 1998-2000), *percent of Hispanic high school graduates* (2005-2009 ACS estimates), *ratio of Hispanic-to-white poverty* (2005-2009 ACS estimates), and *ratio of Hispanic-to-white median household income* (2005-2009 ACS estimates). County-level demographic characteristics include: *percent black* (2010 decennial Census), *percent foreign born* (2005-2009 ACS estimates), and *percent Spanish speakers* (2005-2009 ACS estimates). Health care supply variables included: *number of hospitals with indigent care clinics per 1,000 population in 2008* (the latest year for which this number was available), *number of hospitals with urgent care clinics per 1,000 population in 2008, number of primary care physicians per 1,000 population in 2010, number of physician assistants per 1,000 population in 2010,* and *percentage of physicians who were foreign born* (not including Canada) in 2010. Although the latest year of data varies among these variables, the values are consistent across years for the

counties overall. Therefore, results would not be significantly different if we were to use earlier years (e.g. 2006 or 2007) for each of these variables. These particular county-level characteristics were selected based upon their significant correlations with Hispanic health care access and utilization as well as their significant variation across the different types of Hispanic destinations. While we also considered including percent poverty, percent Hispanic poverty, percent unemployment, and percent of residents without health insurance, those particular variables had significant and strong correlations with other county-level variables that we examined and would have led to problems with multicollinearity in our regression models. The variables that we retained for our regression models all had bivariate correlations of .500 or less.

Covariates

We controlled for a number of individual and county characteristics. Age, age-squared, number of children in the household, and number of adults in the household were continuous variables. Gender (male), marital status (married), self-rated health (poor/fair), presence of a physical or mental health limitation, diagnosis of diabetes, and diagnosis of asthma were all binary variables. We also controlled for US Census region and survey year.

Analysis

We begin by providing descriptive statistics for each of our four dependent variables and all individual- and contextual-level control variables across categories of county destination type and rurality, indicating when significant differences exist between established metropolitan destination counties and all other types of destination counties. We then used two-level binary logistic multilevel models with random intercepts to examine associations between destination

type and odds of having health insurance, access to a personal doctor, obtaining a routine physical health checkup in the past two years, and obtaining a flu shot in the past year. All dependent variables are measured at the binary level. We calculated intraclass correlation coefficients from null models for each of our four dependent variables to determine how much variation in each outcome is attributable to differences between counties vs. characteristics associated with Hispanics themselves. For each outcome variable, we then present a series of main effects models where Model 1 examines associations between destination type, rurality, and each outcome while controlling for individual-level health care need factors (self-rated health, functional limitation, diabetes, and asthma), age, gender, marital status, number of adults and children in the household, census region, and survey year. Model 2 integrates individual-level resource characteristics (household income, educational attainment, employment status, and Spanish vs. English survey completion). For the two health care utilization dependent variables, we include health insurance status and access to a personal doctor in Model 2. Model 3 integrates county-level socioeconomic and demographic characteristics and health care supply characteristics. We then present the results of interaction models that examine the extent to which rurality moderates associations between destination type and each of the health care access and utilization variables. The model building strategy proceeds identical to that used for the main effects models. All analyses, except county-level descriptive statistics, are weighted with a BRFSS-calculated weight assigned to each respondent in the data set based upon gender, race/ethnicity, age, and geography. After deletion of cases with missing information on the variables of interest, we were left with a total of 92,298 Hispanics across six years of data residing within 1030 established, mature new, and recent new destination counties. A map

displaying the geographic distribution of destination types and non-metropolitan vs. metropolitan status is presented in Figure 1.

<Figure 1 here>

Results

Describing Variation across Destination Type

Individual-level descriptive statistics are presented by destination type and rurality in Table 1. Health insurance status, access to a personal doctor, having a routine physical health checkup, and obtaining a flu shot all vary tremendously across destination and rurality type. Hispanics in metropolitan recent new destination counties are the most likely to report having health insurance and a personal doctor. They are also the most likely to report having a routine heath checkup in the past two years. Except for Hispanics living in metropolitan recent new or metro-adjacent large non-metropolitan recent new destinations, Hispanics living in metropolitan established destination counties are more likely than Hispanics living in any other destination type to have health insurance and access to a personal doctor. On average, Hispanics living in mature new destinations are the most disadvantaged when it comes to health care access, particularly those Hispanic who reside in small or medium non-metropolitan mature new destinations. For instance, while 67.1% of Hispanics in metropolitan established destinations reported having health insurance, only 40.1% of Hispanics residing in remote rural mature new destination counties reported having health insurance. As would be anticipated by the literature documenting employer steps to keep Hispanic workers healthy in rural counties with significant employment in meat packing and other factory work, Hispanics living in small or medium non-metropolitan recent new destinations are the most likely to report having a flu shot in the past year.

<Table 1 here>

In terms of individual-level resource characteristics, Hispanics in non-metropolitan counties are significantly disadvantaged relative to those in metropolitan counties, particularly in mature new destinations. For example, Hispanics who live in mature new small and median non-metropolitan destinations have the lowest household income and educational attainment and are the most likely to have completed the survey in Spanish, indicating lower levels of acculturation. On average, Hispanics residing in metropolitan new destinations (both mature and recent) are the most likely to be in the highest household income category ($50,000 or greater) and are the most likely to be college graduates.

<Table 2 here>

Descriptive statistics for county-level characteristics are presented by destination type and rurality in Table 2. Not surprisingly, non-metropolitan counties have lower SES than metropolitan counties. Median household income is the lowest in small and medium mature new destinations that are adjacent to metropolitan areas and highest in metropolitan recent new destinations. Established nonmetropolitan destinations that are adjacent to metropolitan areas are the most likely to be farming dependent while metropolitan counties across all three destination types are the most likely to be service dependent. On average, Hispanics do the best socioeconomically in metropolitan and metro-adjacent large non-metropolitan recent new destinations, where they have the highest percentage of Hispanics with a high school diploma, while small and medium non-metropolitan mature new destinations have the lowest percentages of Hispanics with a high school degree. Overall, the percentage of the population that are Spanish speakers is the highest in established destinations and lowest in recent new destinations. The health care supply varies tremendously across destination type and rurality with an overall

lower supply of hospitals with indigent care clinics and urgent care clinics in metropolitan counties than in non-metropolitan counties but a greater supply of primary care physicians and physician's assistants in metropolitan counties than in non-metropolitan counties. With the exception of the remote rural established destination category, established destinations had the greatest percentage of physicians who were foreign medical school graduates.

Health Care Access across New vs. Established Destinations

Results of the null model for health insurance status (not shown to conserve space but available upon request) indicated significant county-level variation (county-level variance = .534; $p<.001$) with an intraclass correlation coefficient (ICC) of .140, indicating that about 14% of the variation in health insurance status among Hispanics is attributable to differences between counties. Access to a personal doctor had similar county-level variation (county-level variance = .422; $p<.001$) with an ICC of .114, indicating that 11.4% of the variation in access to a personal doctor among Hispanics was explained by differences between counties. Results of the main effects models predicted health insurance status and access to a personal doctor are presented in Table 3.

<Table 3 here>

Results of Model 1 for health insurance status demonstrate that, net of controls for individual-level predisposing and health care need factors, Hispanics in mature new destinations have significantly lower odds of having any type of health insurance relative to Hispanics in established destinations (OR = 0.784; $p<.01$), but there are no significant differences between Hispanics in new recent vs. established destinations. In addition, with the exception of Hispanics in metro-adjacent large non-metropolitan counties, Hispanics in each subsequent category of

rurality have lower odds of having health insurance compared with Hispanics in metropolitan counties. This disadvantage is slightly attenuated with the addition of individual-level resource characteristics (household income, educational attainment, employment status, and English proficiency) in Model 2. The addition of individual-level resource characteristics explained about 23% of the disadvantage for Hispanics in mature new destinations relative to established destinations. The health insurance disadvantage for Hispanics in mature new destinations remains unchanged with the addition of county-level socioeconomic, demographic, and health care supply characteristics in Model 3, but the rurality disadvantage is further mediated by the introduction of these context variables.

Turning to the results for the models analyzing access to a personal doctor, once again, Hispanics residing in mature new destinations have significantly lower odds of reporting access to a personal health care provider compared with Hispanics in established destinations (OR = 0.803; $p<.01$). Interestingly, Hispanics residing in metro-adjacent non-metropolitan counties have significantly lower odds of having a personal doctor than do Hispanics residing in metropolitan counties, but there are no significant differences between Hispanics in remote nonmetropolitan counties and Hispanics in metropolitan counties in access to a personal doctor. The introduction of individual-level resource characteristics in Model 2 completely mediated the mature new destination disadvantage as well as the disadvantage for Hispanics living in metro-adjacent non-metropolitan counties. There was no additional change with the addition of contextual characteristics in Model 3.

Health Care Utilization across New vs. Established Destinations

Results of null models also demonstrated significant county-level variation in obtaining a routine physical health checkup in the past two years (county-level variance = .395; p<.001) and receiving the flu shot in the past year (county-level variance = .192; p<.001) with ICCs of .107 and .055, respectively.

<Table 4 here>

Table 4 presents the results from the main effects models examining health care utilization. Results of Model 1 for the outcome of having a routine physical health checkup in the past 2 years demonstrate no significant destination type differences. However, compared with Hispanics living in metropolitan counties, those in metro-adjacent small or medium non-metropolitan counties have significantly greater odds of reporting a health checkup in the past 2 years (OR = 1.23; p<.05). This advantage is completely mediated by individual-level resource characteristics introduced in Model 2, and there are no additional changes with the introduction of contextual characteristics in Model 3. Results from the first flu shot model (Model 1) demonstrate that Hispanics in mature new destinations are more likely than those in established destinations to have received a flu shot. The introduction of individual-level resource characteristics (Model 2) does not explain that advantage, but the introduction of contextual characteristics in Model 3 completely mediates that difference. In addition, compared with Hispanics residing in metropolitan counties, those living in metro-adjacent large non-metropolitan counties are less likely to report receiving a flu shot. That difference disappears with the introduction of individual level resource characteristics in Model 2 but reemerges with the addition of contextual characteristics in Model 3.

The Moderating Role of Rurality

Results of the first interaction model for health insurance (Table 5) show a significant interaction between recent new destinations and metro-adjacent small and medium non-metropolitan destinations; compared with Hispanics residing in metropolitan established destinations, the only group of Hispanics to have lower odds of health insurance are those residing in metro-adjacent small and medium non-metropolitan recent new destinations. However, the disadvantage for that specific residential group of Hispanics is completely explained by differences in individual-level resource characteristics (Model 2). After the introduction of contextual characteristics in Model 3, the only disadvantage that remains significant is for Hispanics residing in mature new destinations, regardless of rurality. In examining the models for access to a personal doctor, we see that there are three significant interactions. Compared with Hispanics in metropolitan established destinations, Hispanics living in small and medium remote non-metropolitan new destinations (both mature new and recent new) are at a particular disadvantage as are Hispanics living in recent new metro-adjacent small and medium nonmetropolitan destinations. The significance of those interactions disappears with the addition of individual-level resource characteristics in Model 2, and in the full model (Model 3), there are no significant differences between Hispanics across destination type or rurality.

<Table 5 about here>

Finally, the results of the interaction models for health care utilization are presented in Table 6. For the model assessing odds of obtaining a routine physical health checkup in the past 2 years, there are no significant interactions. However, the main effects for three out of the four rurality types are significant. Those significant differences do not disappear with the introduction of individual-level resource characteristics (Model 2) but are eliminated with the introduction of

contextual characteristics (Model 3). With the first model predicting flu shot (Model 1), we find that there are significant interactions for types of destinations. Compared with Hispanics in metropolitan established destinations, those in metro-adjacent small and medium non-metropolitan mature new destinations and those in metro-adjacent large non-metropolitan recent new destinations are less likely to have received a flu shot. These differences are not mitigated by individual-level need factors (Model 2), but the disadvantage for Hispanics in metro-adjacent small and medium non-metropolitan mature new destinations is explained by the introduction of contextual characteristics in Model 3.

<Table 6 here>

Discussion

This study makes a substantial contribution to our understanding of the factors that influence differences in health care access and utilization among Hispanics living in new and established destinations and provides insight into the role of rurality in moderating those differences. It is the first study to use a large nationally representative sample of Hispanics in both urban and rural areas to assess multiple measures of health care access and utilization, to differentiate new destinations by metropolitan status *and* the timing and speed of their Hispanic population growth, and to explore the extent to which any observed differences in health care access and use across destinations can be explained by differences in individual-level Hispanic resource characteristics, differences in the health care market, and/or differences in the sociodemographic characteristics of the destinations themselves.

We found significant variation in Hispanic health care access and utilization between established, mature new, and recent new destinations. Overall, Hispanics in metropolitan recent new destinations – those that did not achieve new destination status until 2000 – are the most

likely to have health insurance and a personal doctor and are the most likely to have obtained a routine physical health checkup in the past 2 years. This health care access and use advantage among this particular group of Hispanics can be explained by their overall advantage in individual-level enabling factors (Andersen 1995). This group of Hispanics has the highest income and educational attainment and is the least likely to have completed the survey in Spanish relative to most other groups of Hispanics, suggesting higher levels of acculturation, greater ease of communicating with health care professionals, and better access to medical information. Previous studies examining individual level outcomes between established and new destinations tend to treat all new destinations the same, often ignoring the larger processes of change happening in those areas over time as well as substantial differences in the composition and context of those areas.

In terms of rurality, Hispanics residing in non-metropolitan counties were less likely than those in metropolitan counties to have health insurance, access to a personal doctor, have obtained a physical exam in the past two years or have obtained a flu shot in the past year. However, this disadvantaged varied across type of nonmetropolitan county. While Hispanics residing in metro-adjacent large non-metropolitan counties had comparable access to health insurance as those in metropolitan counties, they were less likely to have access to a personal doctor or to have obtained a flu shot. Hispanics in small and medium non-metropolitan counties were the most disadvantaged when it came to health insurance, but this did not affect their access to a personal doctor or use of health care services.

References

Andersen, Ronald M. 1995. "Revisiting the Behavioral Model and Access to Medical Care: Does it Matter?" *Journal of Health and Social Behavior* 36:1-10.

Andersen, Ronald M., and John F. Newman. 1973. "Societal and Individual Health Determinants of Medical Care Utilization in the United States." *Milbank Memorial Fund Quarterly* 51:95-124.

Blewett, Lynn A., Sally A. Smaida, Claudia Fuentes, and Ellie U. Zuehlke. 2003. "Health Care Needs of the Growing Latino Population in Rural America: Focus Group Findings in One Midwestern State." *Journal of Rural Health* 19(1):33-41.

Blewett, Lynn A., Michael Davern, and Holly Rodin. 2005. "Employment and Health Insurance Coverage for Rural Latino Populations." *Journal of Community Health* 30(3):181-195.

Casey, Michelle M., Lynn A. Blewett, and Kathleen T. Call. 2004. "Providing Health Care to Latino Immigrants: Community-Based Efforts in the Rural Midwest." *American Journal of Public Health* 94:1709-1711.

Coronado, Cloria D., Beti Thompson, Thomas D. Koepsell, Stephen M. Schwartz, and Dale McLerran. 2004. "Use of Pap Test among Hispanics and non-Hispanic Whites in a Rural Setting." *Preventive Medicine* 38(6):713-722.

Cristancho, Sergio, D. Marcela Garces, Karen E. Peters, and Benjamin C. Mueller. 2008. "Listening to Rural Hispanic Immigrants in the Midwest: A Community-Based Participatory Assessment of Major Barriers to Health Care Access and Use." *Qualitative Health Research* 18(5):633-646.

Crowley, Martha and Daniel Lichter. 2009. "Social Disorganization in New Latino Destinations?" *Rural Sociology* 74(4): 573-604.

Cunningham, Peter, Michelle Banker, Samantha Artiga, and Jennifer Tolbert. 2006. *Health Coverage and Access to Care for Hispanics in "New Growth Communities" and "Major Hispanic Centers". Washington, CD: Kaiser Commission on Medicaid and the Uninsured*. Retrieved from http://www.kff.org/uninsured/7551.cfm.

Derose, Kathryn P, Benjamin W. Bahney, Nichole Lurie, and Jose J. Escarce. 2009. "Review: Immigrants and Health Care Access, Quality, and Cost." *Medical Care Research and Review* 66(4):355-408.

Deyo, Richard A., Andrew K. Diehl, Helen Hazuda, and Michael P. Stern. 1985. "A Simple Language-based Acculturation Scale for Mexican Americans: Validation and Application to Health Care Research." *American Journal of Public Health* 75(1):51-55.

Erwin, D.O. 2003. "An Ethnographic Description of Latino Immigration in Rural Arkansas: Intergroup Relations and Utilization of Healthcare Services." *Southern Rural Sociology* 19:46-72.

Escarce, Jose J. 2007. *Racial and Ethnic Disparities in Access to and Quality of Health Care*. Research Synthesis Report No. 12. Princeton, NJ: Robert Wood Johnson Foundation.

Gouveia, Lourdes and Rogelio Saenz. 2000. "Global Forces and Latino Population Growth in the Midwest: A Regional and Subregional Analysis." *Great Plains Research: A Journal of Natural and Social Sciences* 10:305-328.

Gresenz, Carole R., Kathryn P. Derose, Teague Ruder, and Jose J. Escarce. 2012. "Heath Care Experiences of Hispanics in New and Traditional U.S. Destinations." *Medical Care Research and Review* 69(6):663-678.

Gresenz, Carole R., Jeannette Rogowski, and Jose J. Escarce. 2009. "Community Demographics and Access to Health Care among US Hispanics." *Health Services Research* 44:1542-1562.

Haas, Jennifer S., Kathryn A. Phillips, Dean Sonneborn, Charles E. McCulloch, Laurence C. Baker, Celia P. Kaplan, Eliseo J. Perez-Stable, and Su-Ying Liang. 2004. "Variation in Access to Health Care for Different Racial/Ethnic Groups by the Racial/Ethnic Composition of an Individual's County of Residence." *Medical Care* 42(7):707-14.

Harari, Nurit, Matthew Davis, and Michele Heisler. 2008. "Strangers in a Strange Land: Health Care Experiences for Recent Latino Immigrants in Midwest Communities." *Journal of Health Care for the Poor and Underserved* 19(4):1350-1367.

Hubbell, Anne P. 2006. "Mexican American Women in a Rural Area and Barriers to their ability to Enact Protective Behaviors against Breast Cancer. *Health Communication* 20(1):35-44.

Johnson, Kenneth M. and Daniel T. Lichter. 2008. "Natural Increase: A New Source of Population Growth in Emerging Hispanic Destinations in the United States." *Population Development Review* 34:327-346.

Kandel, William and John Cromartie. 2004. *New Patterns of Hispanic Settlement in Rural America: A Report from the Economic Research Service.* U.S. Department of Agriculture.

Kandel, William and Emilio A. Parrado. 2005. "Restructuring of the U.S. Meat Processing Industry and New Hispanic Migrant Destinations." *Population and Development Review* 31:447-471.

Kapur, Kanika and Jose J. Escarce. 2006. "Access to and Quality of Health Care. Pp 410-446 in M. Tienda and F. Mitchell (Eds.), *Hispanics and the Future of America*. Chichester, England: National Academies Press.

Kirby, James B., Gregg S. Taliaferro, and Samuel H. Zuvekas. 2006. "Explaining Racial and Ethnic Disparities in Health Care." *Medical Care* 44(5):1-64.

Lees, Karen A., Pascale M. Wortley, and Steven S. Coughlin. 2005. "Comparison of Racial/Ethnic Disparities in Adult Immunization and Cancer Screening." *American Journal of Preventive Medicine* 29:404-411.

Lichter, Daniel T. and Kenneth M. Johnson. 2006. "Emerging Rural Settlement Patterns and the Geographic Redistribution of America's New Immigrants." *Rural Sociology* 71:109-131.

Lichter, Daniel T. and Kenneth M. Johnson. 2009. "Immigrant Gateways and Hispanic Migration to New Destinations." *International Migration Review* 43:496-518.

Marin, Geraldo. 1992. "Issues in the Measurement of Acculturation among Hispanics." In K.F. Geisinger, ed., *Psychological Testing of Hispanics*. Washington DC: American Psychological Association.

McConnell, Eileen Diaz and Felicia B. LeClere. 2002. "Selection, Context, or Both: The English Fluency of Mexican Immigrants in the American Midwest and Southwest." *Population Review and Policy Review* 21:179-204.

McLaughlin, Diane K., C. Shannon Stokes, and Atsuko Nonoyama. 2001. "Residence and Income Inequality: Effects on Mortality among U.S. Counties." *Rural Sociology* 66(4):579-598.

McLaughlin, Diane K. and C. Shannon Stokes. 2002. "Income Inequality and Mortality in US Counties: Does Minority Racial Concentration Matter?" *American Journal of Public Health* 92(1):99-104.

Orrenius, Pia M. and Madeline Zavodny. 2009. "Do Immigrants Work in Riskier Jobs?" *Demography* 46:535-551.

Parisi, Domenico and Daniel T. Lichter. 2007. *Hispanic Segregation in America's New Rural Boomtowns*. Washington, DC: Population Reference Bureau.

Singer, Audrey. 2004. *The Rise of New Immigrant Gateways*. Washington, DC: Brookings Institution.

Singer, Audrey. 2008. "Twenty-First Century Gateways." Pp 3-30 in *Twenty-First Century Gateways: Immigrant Incorporation in Suburban America*, edited by A. Singer, S.W. Hardwick, and C.B. Brettell. Washington, DC: Brookings Institution Press.

Stamps, Katherine and Stephanie A. Bohon. 2006. "Educational Attainment in New and Established Latino Metropolitan Destinations." *Social Science Quarterly* 87(5):1225-1240.

Suro, Roberto and Audrey Singer. 2002. *Latino Growth in Metropolitan America: Changing Patterns, New Locations*. Center on Urban & Metropolitan Policy and the Pew Hispanic Center. Washington, DC: The Brookings Institute.

USDA Economic Research Service. 2003. *Rural-Urban Continuum Codes*. Available at http://www.ers.usda.gov/data-products/rural-urban-continuum-codes.aspx#.UjdGI8ZON8E.

Weinick, Robin M., Elizabeth A. Jacobs, Lisa C. Stone, Alexander N. Ortega, and Helen Burstin. 2004. "Hispanic Healthcare Disparities: Challenging the Myth of a Monolithic Hispanic Population." *Medical Care* 42(4):313-20.

Wooldridge, Judith, Ian Hill, Mary Harrington, Genevieve Kenney, Corinna Hawkes, and Jennifer Haley. 2003. *Interim Evaluation Report: Congressionally Mandated Evaluation of the State Children's Health Insurance Program* (MPR Reference No: 8782-110). Report to the Department of Health and Human Services. Washington, DC.

Zuvekas, Samuel H. and Gregg S. Taliaferro. 2003. "Pathways to Access: Health Insurance, the Health Care Delivery System, and Racial/Ethnic Disparities, 1996-1999." *Health Affairs* 22(2):139-153.

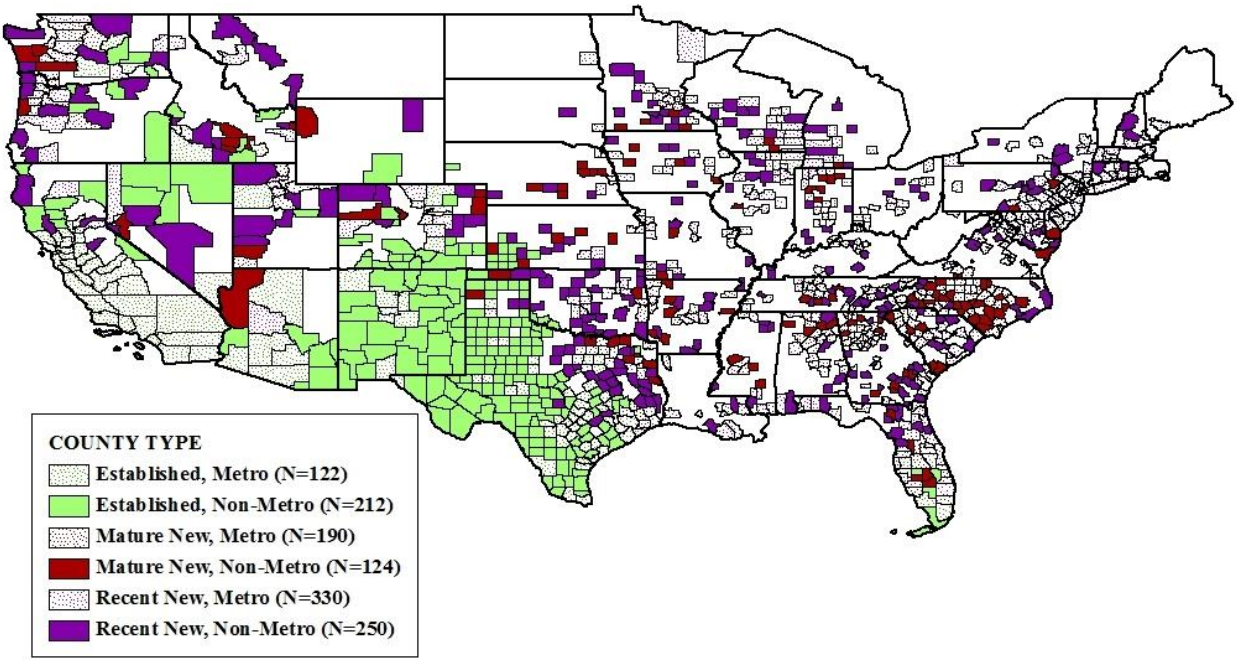

Figure 1. Distribution of Hispanic Destinations by Metropolitan vs. Non-Metropolitan Status

Note: The BRFSS masks county FIPS codes for counties where fewer than 50 respondents were surveyed. Accordingly, we were unable to include all 1,228 established and new destination counties in our analysis. Of the three county types, we were most likely to lose established destinations due to data restrictions. See Appendix A for comparisons.

Table 1. Individual-Level Descriptive Statistics by Destination Type

	Established Destinations					**Mature New Destinations**					**Recent New Destinations**				
	Metro	*Large Non-Met*		*Small/Med Non-Met*		*Metro*	*Large Non-Met*		*Small/Med Non-Met*		*Metro*	*Large Non-Met*		*Small/Med Non-Met*	
		Adj.	Not Adj.	Adj.	Not Adj.		Adj.	Not Adj.	Adj.	Not Adj.		Adj.	Not Adj.	Adj.	Not Adj.
Dependent Variables															
Health insurance	67.1	**61.3**	**57.6**	**62.5**	64.9	**61.3**	**56.9**	**48.5**	**43.6**	**40.1**	**69.7**	67.1	**54.5**	**50.3**	**48.1**
Personal doctor	61.3	61.3	**65.1**	**65.3**	**71.6**	**60.1**	**51.2**	**49.3**	**49.6**	**42.5**	**69.4**	**65.2**	59.0	**56.9**	**55.9**
Routine checkup	77.4	**71.7**	**72.8**	**68.8**	**70.6**	78.2	**72.6**	**67.2**	**70.3**	**66.4**	**80.6**	74.6	**69.4**	**68.2**	**71.4**
Flu shot	25.2	**29.6**	**34.3**	**33.3**	**34.0**	**28.4**	**30.0**	26.5	23.7	26.0	**30.4**	23.3	**32.4**	**34.1**	**41.3**
Covariates															
Age	40.2 (18.0)	**41.2 (7.4)**	**42.0 (5.7)**	39.8 (8.1)	**44.5 (6.7)**	**38.2 (12.1)**	**37.2 (10.3)**	**35.8 (5.8)**	38.1 (9.7)	**34.8 (6.05)**	**39.5 (11.6)**	40.9 (12.1)	39.1 (10.3)	39.7 (9.9)	40.0 (8.1)
Gender (male)	50.9	**48.3**	**46.5**	**53.4**	48.5	**54.4**	52.0	**59.6**	**62.0**	58.7	51.4	52.6	**57.7**	**58.5**	**58.0**
Marital (married)	54.8	**63.9**	**61.4**	54.3	**58.7**	**61.9**	53.2	**67.0**	**50.6**	**51.3**	**57.8**	58.0	**59.4**	**66.3**	**63.7**
Adults in HH	2.8 (1.51)	**2.6 (.60)**	**2.5 (.40)**	**2.6 (.55)**	**2.2 (.42)**	**2.6 (1.04)**	**2.5 (.72)**	2.9 (.66)	**2.6 (.79)**	**3.0 (.82)**	**2.6 (.98)**	**2.5 (.97)**	**2.6 (.83)**	**2.5 (.71)**	**2.4 (.57)**
Children in HH	1.4 (1.63)	**1.5 (.71)**	1.4 (.52)	1.4 (.71)	**1.1 (.59)**	1.4 (1.17)	1.4 (.96)	**1.7 (.56)**	1.3 (.90)	**1.7 (.70)**	**1.2 (1.0)**	1.4 (1.1)	1.3 (.83)	1.3 (.90)	1.4 (.77)
Health status (poor/fair)	26.2	**24.1**	**28.6**	**29.4**	25.5	**19.7**	**22.5**	**22.1**	26.7	26.0	**19.6**	**23.1**	26.0	**20.4**	22.8
Functional limitation	13.2	13.7	**15.3**	13.9	**18.5**	**11.2**	13.2	**6.2**	11.7	**4.5**	**15.1**	**17.2**	15.4	**17.1**	15.9
Diagnosed with diabetes	9.5	**11.1**	**14.7**	9.2	**11.3**	**6.5**	**7.4**	**5.8**	**6.1**	**3.9**	**7.6**	8.9	**12.3**	9.2	10.3
Diagnosed with asthma	10.2	**9.1**	10.8	**12.9**	10.0	10.2	10.0	**5.6**	**6.2**	**2.5**	**12.6**	**12.9**	11.6	10.4	12.0
Survey in Spanish	45.2	**40.9**	**36.0**	**33.3**	**23.5**	**36.0**	46.4	**55.5**	**55.9**	**69.1**	**26.4**	**25.2**	**33.6**	**37.0**	45.8
Annual household inc.	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Less than $25,000	49.6	**52.0**	**52.3**	49.6	50.6	**42.1**	**57.2**	**54.8**	**67.9**	**62.0**	**38.9**	46.6	50.4	**56.8**	**60.0**
$25,000-49,999	27.1	**29.6**	**29.5**	**29.6**	**32.4**	26.6	26.3	**31.7**	**21.2**	31.5	**28.2**	29.4	**31.1**	29.3	27.2
$50,000 or greater	23.4	**18.5**	**18.3**	**20.7**	**17.1**	**31.3**	**16.5**	**13.6**	**10.9**	**6.5**	**32.9**	24.0	**18.5**	**13.9**	**12.7**
Educational attainment	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
< High school	35.8	35.5	37.3	**32.9**	**31.7**	**24.3**	**41.5**	39.6	**43.1**	**55.4**	**22.5**	**27.6**	36.2	**42.0**	**46.2**
High school grad	48.4	**54.5**	**53.1**	**57.4**	**58.2**	**52.0**	49.7	52.6	51.1	**38.9**	**54.6**	**57.0**	**56.3**	**48.7**	47.4
College graduate	15.8	**10.0**	**9.6**	**9.7**	**10.1**	**23.6**	**8.8**	**7.8**	**5.8**	**5.7**	**22.9**	15.4	**7.5**	**9.4**	**6.4**
Employed	60.6	60.9	**58.7**	**55.5**	58.8	**68.0**	**64.0**	**67.9**	**67.2**	**75.7**	**66.2**	**65.9**	57.8	**66.1**	59.1

Note: weighted; bolded values indicate significant difference from established metro Hispanics at p<.05 or better; Adj.=adjacent to metropolitan area, Non-Adj.=not adjacent to a metro area

Table 2. County-Level Descriptive Statistics by Destination Type (continued on next table)

	Established Destinations				
	Metro	*Large Non-Met*		*Small/Med Non-Met*	
Economic and Demographic Characterstics		Adjacent	Not Adj	Adjacent	Not Adj
Median household income	52,001.4 (12,116.8)	**38,095.3 (6,447.9)**	**44,526.1 (11,766.4)**	**40,199.8 (12,179.2)**	**41,173.3 (7,266.1)**
Percent high school graduates	79.9 (6.7)	**74.5 (9.8)**	76.1 (9.7)	**74.8 (8.5)**	79.1 (9.0)
Persistent poverty county	7.8	25.0	13.3	**29.0**	20.0
Farming dependent county	2.6	20.0	6.7	**23.7**	**20.0**
Service dependent county	28.7	10.0	13.3	**5.3**	20.0
Percent Hispanic high school graduates	48.5 (7.2)	48.5 (11.1)	47.8 (10.7)	45.6 (10.2)	48.8 (12.5)
Ratio of Hispanic-to-white poverty	2.6 (0.7)	2.5 (0.7)	2.9 (2.1)	**2.2 (0.8)**	**2.1 (0.7)**
Ratio of white-to-Hispanic median household inc	1.5 (0.3)	1.5 (0.3)	1.5 (0.3)	**1.4 (0.2)**	**1.4 (1.3)**
Percent black	7.2 (7.6)	5.1 (6.0)	**2.4 (2.3)**	**4.2 (5.7)**	**1.6 (2.3)**
Percent foreign born	17.0 (10.0)	12.4 (8.7)	13.9 (8.7)	**10.0 (6.1)**	**9.0 (6.5)**
Percent spanish	26.6 (14.9)	31.7 (22.7)	30.7 (23.9)	28.4 (15.0)	24.2 (13.5)
Region					
Northeast	9.6	**0.0**	**0.0**	**0.0**	**0.0**
Midwest	1.7	0.0	20.0	**0.0**	4.0
South	41.7	60.0	33.3	50.0	32.0
West	47.0	40.0	46.7	50.0	64.0
Health Care Supply					
Hospitals w/indigent care clinics per 1,000 pop	0.07 (0.08)	**0.17 (0.13)**	**0.19 (0.11)**	**0.07 (0.08)**	**0.29 (0.28)**
Hospitals w/urgent care clinics per 1,000 pop	0.06 (0.06)	**0.19 (0.12)**	**0.15 (0.13)**	**0.15 (0.23)**	**0.21 (0.24)**
Primary care physicians per 1,000 pop	0.61 (0.27)	0.49 (0.22)	0.56 (0.46)	0.50 (0.34)	0.60 (0.27)
Physicians assistants per 1,000 pop	2.07 (1.66)	1.03 (2.63)	**0.36 (0.88)**	**0.00 (0.00)**	**0.00 (0.00)**
Percent of physicians who are foreign graduates	25.7 (15.1)	28.6 (17.9)	32.1 (17.3)	21.7 (18.9)	**15.9 (14.7)**

Note: unweighted; bolded values indicate significant difference from established metro counties at p<.05 or better

Table 2 cont. County-Level Descriptive Statistics by Destination Type

	Mature New Destinations					**Recent New Destinations**				
	Metro	*Large Non-Met*		*Small/Med Non-Met*		*Metro*	*Large Non-Met*		*Small/Med Non-Met*	
		Adjacent	Remote	Adjacent	Remote		Adjacent	Remote	Adjacent	Remote
Economic and Demographic Characterstics										
Median household income	52782.5 (14,624.7)	**42,085.2 (7,085.0)**	47,597.0 (8,648.0)	**38,003.4 (6,335.4)**	**44,510.7 (11,865.2)**	**55,007.7 (13,333.6)**	**45,004.2 (8,860.3)**	**42,940.4 (8,433.8)**	**42,016.0 (7,300.6)**	**40,994.9 (8,906.5)**
Percent high school graduates	**85.1 (5.9)**	81.2 (5.5)	**86.8 (3.0)**	**75.6 (5.5)**	80.4 (9.0)	**87.4 (4.6)**	**84.4 (5.1)**	**86.2 (5.3)**	81.6 (5.2)	81.6 (6.4)
Persistent poverty county	**2.2**	2.4	**0.0**	17.8	7.7	**1.3**	5.9	3.0	5.4	9.1
Farming dependent county	0.5	0.0	0.0	**13.3**	23.1	0.0	0.0	0.0	4.1	9.1
Service dependent county	29.7	**7.3**	12.5	0.0	23.1	26.8	22.1	18.2	**10.8**	15.2
Percent Hispanic high school graduates	**44.2 (9.1)**	**40.1 (11.2)**	40.0 (11.8)	**36.3 (10.9)**	**34.1 (11.2)**	**51.1 (9.4)**	**51.5 (10.1)**	47.9 (12.0)	**41.9 (11.8)**	**41.9 (13.3)**
Ratio of Hispanic-to-white poverty	**3.0 (1.1)**	2.9 (1.0)	2.6 (0.8)	2.4 (1.1)	**3.1 (0.9)**	2.6 (1.2)	2.5 (1.1)	2.2 (1.0)	2.5 (1.1)	2.4 (0.8)
Ratio of white-to-Hispanic median household inc	**1.4 (0.3)**	**1.4 (0.3)**	**1.3 (0.2)**	**1.3 (0.3)**	1.4 (0.3)	**1.4 (0.3)**	**1.4 (0.4)**	1.4 (0.7)	**1.3 (0.4)**	1.4 (0.4)
Percent black	**13.7 (13.0)**	**12.1 (12.8)**	3.6 (6.3)	**13.7 (15.5)**	7.4 (10.9)	**10.9 (9.5)**	8.3 (11.9)	6.9 (11.7)	7.0 (10.4)	5.7 (9.6)
Percent foreign born	**7.8 (4.8)**	**5.4 (1.9)**	**8.6 (3.7)**	**6.7 (3.9)**	**12.0 (5.2)**	**5.6 (5.1)**	**3.6 (2.1)**	**3.4 (2.1)**	**4.4 (2.2)**	**4.5 (3.3)**
Percent Spanish speakers	**7.0 (4.7)**	**6.6 (2.6)**	**11.6 (5.2)**	**9.3 (5.3)**	**16.3 (8.0)**	**4.3 (3.4)**	**3.8 (2.8)**	**4.0 (3.8)**	**6.1 (3.7)**	**5.7 (3.4)**
Region										
Northeast	**2.2**	2.4	**0.0**	**0.0**	**0.00**	**18.0**	10.3	3.0	**2.7**	**0.0**
Midwest	**18.9**	**24.4**	**75.0**	**13.3**	30.8	**26.2**	**26.5**	**27.3**	**20.3**	**24.2**
South	**70.8**	**61.0**	12.5	**82.2**	38.5	46.1	50.0	42.4	**62.2**	54.6
West	**8.1**	**12.2**	12.5	**4.4**	30.8	**9.8**	**13.2**	**27.3**	**14.9**	**21.2**
Health Care Supply										
Hospitals w/indigent care clinics per 1,000 pop	0.07 (0.08)	**0.14 (0.09)**	**0.22 (0.12)**	**0.20 (0.19)**	**0.26 (0.10)**	**0.09 (0.09)**	**0.17 (0.14)**	**0.19 (0.15)**	**0.22 (0.23)**	**0.26 (0.24)**
Hospitals w/urgent care clinics per 1,000 pop	0.07 (0.07)	**0.14 (0.10)**	**0.26 (0.08)**	**0.15 (0.15)**	0.17 (0.22)	**0.09 (0.08)**	**0.13 (0.12)**	**0.17 (0.13)**	**0.18 (0.17)**	**0.16 (0.08)**
Primary care physicians per 1,000 pop	**0.69 (0.36)**	**0.52 (0.19)**	0.67 (0.12)	**0.40 (0.16)**	0.66 (0.24)	**0.71 (0.33)**	0.60 (0.22)	**0.77 (0.28)**	**0.47 (0.20)**	0.57 (0.17)
Physicians assistants per 1,000 pop	**2.78 (2.53)**	1.92 (2.26)	**0.23 (0.65)**	**0.34 (1.16)**	**0.00 (0.00)**	**3.28 (2.54)**	1.80 (2.62)	**1.04 (1.96)**	**0.19 (0.98)**	**0.00 (0.00)**
Percent of physicians who are foreign graduates	**18.7 (12.0)**	**19.8 (12.7)**	**12.2 (5.2)**	**17.9 (11.4)**	18.4 (16.6)	**19.6 (11.3)**	**17.8 (12.2)**	**13.7 (10.0)**	**15.8 (13.1)**	**16.6 (14.0)**

Note: unweighted; bolded values indicate significant difference from established metro counties at p<.05 or better

Table 3. Main Effects Models Predicting Health Insurance and Access to a Personal Doctor

	Health Insurance			Access to Personal Doctor		
	Model 1[a]	*Model 2*[b]	*Model 3*[c]	*Model 1*[a]	*Model 2*[b]	*Model 3*[c]
Destination Type						
Established (ref)	-----	-----	-----	-----	-----	-----
New Mature	-0.243 (.077)**	-0.186 (.072)**	-0.187 (.094)*	-0.219 (.071)**	-0.104 (.074)	-0.112 (.097)
New Recent	-0.003 (.071)	-0.114 (.065)	-0.135 (.090)	0.034 (.065)	-0.010 (.067)	-0.001 (.092)
Metro Type						
Metropolitan (ref)	-----	-----	-----	-----	-----	-----
Large Non-Metro, Adjacent to Metro	-0.138 (.093)	-0.046 (.089)	0.089 (.097)	-0.202 (.087)**	-0.087 (.093)	-0.175 (.102)
Small/Medium Non-Metro, Adjacent to Metro	-0.558 (.094)***	-0.309 (.091)***	-0.256 (.113)*	-0.212 (.090)**	0.169 (.096)	0.022 (.120)
Large Non-Metro, Remote	-0.504 (.129)***	-0.382 (.0122)**	-0.299 (.131)*	-0.170 (.122)	0.106 (.129)	-0.027 (.138)
Small/Medium Non-Metro, Remote	-0.650 (.138)***	-0.418 (.135)**	-0.354 (.152)*	-0.183 (.134)	0.246 (.145)	0.081 (.162)
Fixed Effect Intercept	1.164 (.054)***	1.240 (.049)***	1.854 (.579)**	1.172 (.049)***	0.194 (.052)***	0.882 (.603)
Random Effect Intercept	0.357 (.032)***	0.265 (.027)***	0.259 (.027)***	0.272 (.027)***	0.262 (.031)***	0.262 (.031)***
Intraclass Correlation Coefficient	0.098	0.075	0.073	0.076	0.074	0.074
Proportion of Original County-Level Variance Explained	0.331	0.504	0.515	0.355	0.379	0.379

Notes: weighted; *p<.05, **p<.01; ***p<.001; two-tailed test

[a] controls for age, gender, marital status, number of adults and children in household, region, survey year, self-rated health, functional limitation, diagnosis of diabetes, and diagnosis of asthma

[b] controls for all variables in Model 1, plus household income, educational attainment, employment status, and English vs. Spanish survey completion

[c] controls for all variables in Model 2, plus all county-level economic, sociodemographic, and health care supply characteristics

Table 4. Main Effects Models Predicting Physical Health Checkup in Past 2 Years and Flu Shot in Past Year

	Physical Health Checkup in Past 2 Years			**Flu Shot in Past Year**		
	Model 1[a]	*Model 2*[b]	*Model 3*[c]	*Model 1*[a]	*Model 2*[b]	*Model 3*[c]
Destination Type						
Established (ref)	-----	-----	-----	-----	-----	-----
New Mature	0.019 (.060)	-0.069 (.061)	0.016 (.079)	0.177 (.066)**	0.224 (.068)***	0.067 (.085)
New Recent	-0.043 (.054)	-0.029 (.055)	0.006 (.074)	0.088 (.060)	0.073 (.061)	-0.070 (.080)
Metro Type						
Metropolitan (ref)	-----	-----	-----	-----	-----	-----
Large Non-Metro, Adjacent to Metro	0.005 (.079)	-0.102 (.081)	-0.066 (.088)	-0.179 (.084)*	-0.133 (.085)	-0.212 (.090)*
Small/Medium Non-Metro, Adjacent to Metro	0.209 (.082)*	-0.006 (.085)	0.119 (.104)	0.007 (.087)	0.106 (.089)	-0.134 (.106)
Large Non-Metro, Remote	0.023 (.110)	-0.188 (.113)	-0.102 (.120)	0.125 (.114)	0.207 (.117)	0.052 (.120)
Small/Medium Non-Metro, Remote	0.133 (.128)	-0.144 (.132)	0.008 (.146)	0.104 (.129)	0.212 (.132)	-0.072 (.144)
Fixed Effect Intercept	-1.301 (.039)***	-0.216 (.041)***	-0.627 (.501)	-0.713 (.044)***	-1.346 (.050)***	-1.000 (.521)
Random Effect Intercept	0.143 (.019)***	0.134 (.019)***	0.126 (.019)***	0.212 (.022)***	0.224 (.023)***	0.184 (.021)***
Intraclass Correlation Coefficient	0.042	0.039	0.037	0.061	0.064	0.053
Proportion of Original County-Level Variance Explained	0.638	.661	.681	0.000	0.000	0.042

Notes: weighted; *p<.05, **p<.01; ***p<.001; two-tailed test

[a] controls for age, gender, marital status, number of adults and children in household, region, survey year, self-rated health, functional limitation, diagnosis of diabetes, and diagnosis of asthma

[b] controls for all variables in Model 1, plus household income, educational attainment, employment status, English vs. Spanish survey completion, health insurance, and access to a personal doctor

[c] controls for all variables in Model 2, plus all county-level economic, sociodemographic, and health care supply characteristics

Table 5. Destination Type and Rurality Interaction Models Predicting Health Insurance and Access to a Personal Doctor

	Health Insurance			**Access to Personal Doctor**		
	Model 1[a]	*Model 2*[b]	*Model 3*[c]	*Model 1*[a]	*Model 2*[b]	*Model 3*[c]
Destination Type						
Established (ref)	-----	-----	-----	-----	-----	-----
New Mature	-0.158 (.090)	-0.215 (.083)**	-0.209 (.103)*	-0.095 (.081)	-0.056 (.085)	-0.059 (0.106)
New Recent	0.098 (.083)	-0.100 (.076)	-0.115 (.099)	0.138 (.075)	0.025 (.077)	0.049 (.101)
Metro Type						
Metropolitan (ref)	-----	-----	-----	-----	-----	-----
Large Non-Metro, Adjacent to Metro	-0.179 (.178)	-0.112 (.164)	-0.047 (.173)	-0.072 (.161)	0.047 (.167)	-0.023 (.178)
Small/Medium Non-Metro, Adjacent to Metro	-0.195 (.155)	-0.202 (.146)	-0.151 (.167)	0.080 (.144)	0.174 (.150)	0.064 (.174)
Large Non-Metro, Remote	-0.392 (.199)*	-0.425 (.184)*	-0.338 (.192)	0.014 (.184)	0.212 (.193)	0.087 (.201)
Small/Medium Non-Metro, Remote	-0.365 (.197)	-0.389 (.188)*	-0.335 (.205)	0.196 (.192)	0.411 (.205)*	0.309 (.222)
Interactions						
New Mature *Large Non-Metro, Adjacent to Metro	-0.029 (.239)	0.280 (.225)	0.255 (.230)	-0.360 (.220)	-0.259 (.233)	-0.293 (.238)
*Small/Medium Non-Metro, Adjacent to Metro	-0.449 (.245)	-0.062 (.238)	-0.081 (.244)	-0.373 (.232)	0.050 (.249)	0.006 (.257)
*Large Non-Metro, Not Adjacent to Metro	-0.112 (.383)	0.197 (.364)	0.167 (.369)	-0.366 (.357)	-0.243 (.382)	-0.172 (.389)
*Small/Medium Non-Metro, Not Adjacent to Metro	-0.421 (.360)	0.064 (.350)	0.071 (.356)	-0.706 (.343)*	-0.385 (.371)	-0.462 (.378)

New Recent *Large Non-Metro, Adjacent to Metro	0.130 (.233)	0.174 (.220)	0.129 (.225)	-0.026 (.215)	-0.133 (.227)	-0.145 (.232)
*Small/Medium Non-Metro, Adjacent to Metro	-0.657 (.216)**	-0.260 (.208)	-0.245 (.219)	-0.528 (.205)**	-0.033 (.220)	-0.099 (.233)
*Large Non-Metro, Remote	-0.193 (.280)	0.026 (.266)	0.015 (.270)	-0.273 (.264)	-0.162 (.281)	-0.202 (.287)
*Small/Medium Non-Metro, Remote	-0.610 (.319)	-0.157 (.318)	-0.125 (.324)	-0.730 (.314)*	-0.281 (.345)	-0.415 (.351)
Fixed Effect Intercept	1.095 (.061)***	1.242 (.055)***	1.836 (.584)**	1.094 (.054)***	0.167 (.057)**	0.905 (.609)
Random Effect Intercept	0.355 (.032)***	0.267 (.027)***	0.262 (.028)***	0.267 (.027)***	0.265 (.031)***	0.265 (.031)***
Intraclass Correlation Coefficient	0.097	0.075	0.074	0.075	0.075	0.075
Proportion of Original County-Level Variance Explained	0.335	0.500	0.509	0.367	0.372	0.372

Notes: weighted; *p<.05, **p<.01; ***p<.001; two-tailed test

[a] controls for age, gender, marital status, number of adults and children in household, region, survey year, self-rated health, functional limitation, diagnosis of diabetes, and diagnosis of asthma

[b] controls for all variables in Model 1, plus household income, educational attainment, employment status, and English vs. Spanish survey completion

[c] controls for all variables in Model 2, plus all county-level economic, sociodemographic, and health care supply characteristics

Table 6. Destination Type and Rurality Interaction Models Predicting Physical Health Checkup in Past 2 Years and Flu Shot in Past Year

	Physical Health Checkup in Past 2 Years			**Flu Shot in Past Year**		
	Model 1	*Model 2*	*Model 3*	*Model 1*	*Model 2*	*Model 3*
Destination Type						
Established (ref)	-----	-----	-----	-----	-----	-----
New Mature	0.058 (.085)	0.137 (.088)	0.199 (.108)	0.235 (.075)**	0.259 (.077)***	0.082 (.090)
New Recent	.082 (.078)	0.055 (.080)	0.140 (.103)	0.144 (.068)*	0.109 (.070)	-0.044 (.086)
Metro Type						
Metropolitan (ref)	-----	-----	-----	-----	-----	-----
Large Non-Metro, Adjacent to Metro	-0.370 (.164)*	-0.360 (.170)*	-0.178 (.178)	-0.014 (.151)	0.032 (.154)	-0.090 (.155)
Small/Medium Non-Metro, Adjacent to Metro	-0.350 (.146)*	-0.412 (.151)**	-0.122 (.173)	0.194 (.134)	0.208 (.137)	-0.080 (.151)
Large Non-Metro, Remote	-0.285 (.187)	-0.260 (.194)	-0.138 (.199)	0.263 (.169)	0.325 (.173)	0.184 (.171)
Small/Medium Non-Metro, Remote	-0.429 (.189)*	-0.494 (.197)*	-0.176 (.213)	0.075 (.178)	0.096 (.182)	-0.202 (.191)
Interactions						
New Mature *Large Non-Metro, Adjacent to Metro	0.153 (.227)	0.250 (.236)	0.205 (.238)	0.015 (.209)	0.057 (.214)	0.127 (.209)
*Small/Medium Non-Metro, Adjacent to Metro	-0.004 (.239)	0.180 (.249)	0.104 (.254)	-0.626 (.231)**	-0.527 (.237)*	-0.415 (.237)
*Large Non-Metro, Not Adjacent to Metro	-0.018 (.370)	0.086 (.386)	0.185 (.387)	-0.284 (.345)	-0.246 (.353)	-0.209 (.344)
*Small/Medium Non-Metro, Not Adjacent to Metro	0.075 (.345)	0.346 (.360)	0.227 (.363)	-0.183 (.341)	-0.010 (.348)	0.090 (.345)

New Recent *Large Non-Metro, Adjacent to Metro	0.146 (.221)	0.123 (.230)	0.096 (.233)	-0.472 (.206)*	-0.505 (.210)*	-0.451 (.206)*
*Small/Medium Non-Metro, Adjacent to Metro	-0.216 (.209)	0.067 (.218)	0.052 (.229)	-0.124 (.195)	0.045 (.200)	0.112 (.204)
*Large Non-Metro, Remote	-0.106 (.269)	-0.081 (.281)	-0.029 (.282)	-0.221 (.247)	-0.195 (.252)	-0.230 (.246)
*Small/Medium Non-Metro, Remote	0.065 (.322)	0.380 (.339)	0.305 (.343)	0.286 (.299)	0.467 (.306)	0.471 (.305)
Fixed Effect Intercept	1.572 (.056)***	0.502 (.060)***	0.121 (.616)	-0.752 (.049)***	-1.371 (.054)***	-0.998 (.522)*
Random Effect Intercept	0.275 (.029)***	0.288 (.031)***	0.271 (.031)***	0.208 (.022)***	0.220 (.023)***	0.180 (.021)***
Intraclass Correlation Coefficient	0.077	0.080	0.076	0.059	0.063	0.052
Proportion of Original County-Level Variance Explained	0.304	0.271	0.314	0.000	0.000	0.063

Notes: weighted; *p<.05, **p<.01; ***p<.001; two-tailed test

[a] controls for age, gender, marital status, number of adults and children in household, region, survey year, self-rated health, functional limitation, diagnosis of diabetes, and diagnosis of asthma

[b] controls for all variables in Model 1, plus household income, educational attainment, employment status, and English vs. Spanish survey completion

[c] controls for all variables in Model 2, plus all county-level economic, sociodemographic, and health care supply characteristics

Appendix A. Individual Hispanic and County Sample Sizes by Destination Type

County Type	**Individuals**[a]	**%**	**Counties**[b]	**%**
Established Destinations				
Metropolitan	48171	52.1	115	11.2
Large Non-Metropolitan, Adjacent to Metro Area	3057	3.3	20	1.9
Large Non-Metropolitan, Not Adjacent to Metro Area	3551	3.8	15	1.5
Small/Medium Non-Metropolitan, Adjacent to Metro Area	2583	2.8	38	3.7
Small/Medium Non-Metropolitan, Not Adjacent to Metro Area	1563	1.7	25	2.4
Mature New Destinations				
Metropolitan	9183	9.9	185	18.0
Large Non-Metropolitan, Adjacent to Metro Area	1019	1.1	41	4.0
Large Non-Metropolitan, Not Adjacent to Metro Area	565	0.6	8	0.8
Small/Medium Non-Metropolitan, Adjacent to Metro Area	564	0.6	45	4.4
Small/Medium Non-Metropolitan, Not Adjacent to Metro Area	360	0.4	13	1.3
Recent New Destinations				
Metropolitan	19150	20.7	317	30.8
Large Non-Metropolitan, Adjacent to Metro Area	826	0.9	68	6.6
Large Non-Metropolitan, Not Adjacent to Metro Area	606	0.7	33	3.2
Small/Medium Non-Metropolitan, Adjacent to Metro Area	874	0.9	74	7.2
Small/Medium Non-Metropolitan, Not Adjacent to Metro Area	326	0.4	33	3.2
TOTAL	92398	100.0	1030	100.1

[a]weighted; [b]unweighted