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Structural determinants of health access and sexual and reproductive health in

new immigrant populations in California

A dissertation submitted in partial satisfaction

of the requirements for the degree of Doctor of Philosophy

in Community Health Sciences

by

Angubeen Gul Khan

2024

ABSTRACT OF THE DISSERTATION

Structural determinants of health access and sexual and reproductive health

in new immigrant populations in California

by

Angubeen Gul Khan

Doctor of Philosophy in Community Health Sciences

University of California Los Angeles, 2024

Professor Jessica D. Gipson, Chair

Immigrants have been entering the U.S. since its inception; however, predominant immigration flows have changed over time. Following the 1965 Hart-Celler Act, which repealed national quotas for immigration, two pan-ethnic communities that grew significantly include the Middle Eastern North African (MENA) and South Asian immigrant communities (Bhandari, 2022; Harjanto & Batalova, 2022). MENA and South Asian Americans have established themselves as prominent pan-ethnic communities in the U.S. with a large immigrant network throughout the country (Basu, 2016; Cainkar, 2018; Hashad, 2003; Sekhon, 2003). However, following 9/11 they have also experienced record levels of hate crimes, violence, and discrimination, which have been shown to adversely affected their health and health access (Budiman, 2020; Martin, 2015; Reitmanova & Gustafson, 2008; Samuels et al., 2021; Samari et al., 2020). Other groups of immigrants have also suffered from government policies and practices that were enacted in response to 9/11; debates related to illegal immigration and visa

overstays intensified over the following few decades and greatly impacted immigrants from

Mexico, Central America, South America, the Caribbean, and all over Asia (Passel & Cohn,

2014). These events have had a "chilling effect" on the psyche of immigrants from MENA and

South Asian backgrounds, as well as Latin and Asian immigrants Quesada et al., 2011).

In the studies of this dissertation, I examined how factors pertaining to the migration

process have shaped health access and sexual and reproductive healthcare (SRH) of immigrant

groups in a post-9/11 world—an era in which immigrants of various race/ethnicities have been

vilified in a prevailing anti-immigrant sociopolitical climate. In the first two studies of this

dissertation, I explored the neighborhood context that MENA and South Asian immigrants

resettle into (Aim 1; Chapter 6) and how these environments shape their health access (Aim 2;

Chapter 7). In the third study, I focus on the role of citizenship status on contraception use

among reproductive-aged (18-44 years) immigrant women (Aim 3; Chapter 8). This dissertation

used secondary data from large demographic surveys including the 2020 American Community

Survey (ACS) 5-Year Estimates (Aims 1 and 2) and pooled data from 2017 to 2020 waves of the

California Health Interview Survey (CHIS).

Data from the first study indicated that MENA and South Asian Americans in California

are spread across different metropolitan areas of Northern and Southern California and that they

have formed four different types of ethnic neighborhoods that follow a few different social and

economic pattern, in terms of the density of these specific immigrant groups, their overall

foreign-born concentration, and socioeconomic status. The second study indicated that diversity

within these groups, including in terms of their health insurance status, can be observed through

the distinct type of neighborhoods in which they resettle. For example, among MENA

Americans, socioeconomic advantage in a neighborhood was associated with health insurance

status. For South Asians, health insurance status was associated with co-ethnic density and foreign-born density. Finally, in the third study of this dissertation I found that nativity and citizenship status were not significantly associated with contraception use, however, there were notable bivariate differences in *type* of contraception method used by citizenship status.

The findings of this dissertation are important for understanding how different aspects of migration shape health of underrepresented immigrant groups, including MENA and South Asian Americans and non-citizen immigrant groups including legal permanent residents (LPRs) and those without a green card. Researchers and policy makers should use the findings of this dissertation to work toward reducing barriers to health access and SRH in immigrant populations.

The dissertation of Angubeen Gul Khan is approved.

May Sudhinaraset

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Dedication

For Ami, Dr. Zubeda Saied Khan, who believed in me and encouraged me to achieve as high as I

could dream. For Aba, Dr. Mohammad Yahya Khan, who taught me to be strong and steadfast in

the pursuit of my goals.

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There are several people I am grateful to for supporting me in the completion of this dissertation. First, I owe the highest thanks to *Allah (SWT)* (God) for blessing me with the opportunity to pursue and generate knowledge. I pray that I am blessed with the opportunity to use what I have learned to help the people and communities that I care for so deeply.

Next, I would like to thank my chair and mentor, Dr. Jessica Gipson, for supporting me in the toughest and most rewarding moments of my academic journey so far. Your guidance through the research process, and warmth and kindness for my personal struggles, helped shape me into the researcher I am today. I am continuously inspired by you and your dedication to your students, colleagues, and research. I hope that I can emulate the example of your mentorship and compassion throughout my career. I would also like to thank my dissertation committee for guiding and mentoring me, including Dr. May Sudhinaraset, Dr. Randall Kuhn, and Dr. Min Zhou. You believed in my ideas, and more than that, you believed in me. Thank you for guiding me and teaching me at my best and worst and doing so with unconditional compassion and care.

Thank you to my FSPH community, who reviewed drafts upon drafts of my work and gave me thoughtful feedback. Your support and friendship throughout the last five years has made me a better researcher and person. Without you, I could have never reached the finish line.

I would also like to thank my family: my parents, Dr. Zubeda Saied Khan and Dr. Mohammad Yahya Khan, my sister, Dr. Mariam Tajalli Khan, my aunt, Dr. Maliha Sheikh, my uncle, Dr. Waheed Akbar, and Bagheera and Sher Khan. You have always supported me and believed in me even when I struggled to. Bagheera and Sher Khan, you gave me so many moments of laughter and smiles throughout this entire process. Thank you for inspiring me every day.

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1. **Khan, A.G.**, West, H., Razzaque, A., Kuhn, R. (2023). The effects of spousal migration on perinatal healthcare utilization. *BMC Pregnancy Childbirth, 23*, 434. https://doi.org/10.1186/s12884-023-05590-w
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SELECTED CONFERENCE PRESENTATIONS

1. **Khan, A. G.**, Kuhn R., Zhou, M., Sudhinaraset, M. Gipson, J. "Developing an ethnic neighborhood typology for Middle Eastern North African and South Asian Americans in California." Poster presented at the UC Demography Conference in May 2023, Irvine, CA.

2. **Khan, A. G.,** Sudhinaraset, M., Gipson, J. "Documentation status and contraceptive use among women in California" Poster to be presented at the Society of Family Planning Research Meeting in December 3, 2022, Baltimore, MD.

3. **Khan, A.,** West, H. Kuhn, R., & Razzaque, A. "The effects of migration on childbirth and pregnancy-related healthcare utilization." Poster presented at the Population Association of America Annual Research Meeting in April 2022, Atlanta, GA.

4. Kusunoki, Y., **Khan, A.,** Cruz, J., Elabed, L., Makki, M., & Tariq, M. "Sociodemographic Correlates of Intimate Partner Violence and Reproductive Coercion Among Arab American Women in Dearborn, Michigan." Oral paper presented virtually at the Population Association of America Annual Conference in May 2021.

5. **Khan, A.,** Cruz, J., Elabed, L., Tariq, M., Makki, M., & Kusunoki, Y. "Associations between religiosity and intimate partner violence support seeking attitudes among Arab American Muslim women." Poster presented virtually at the Conference on Religion and Medicine in March 2021.

6. *Khan, A., Cruz, J., Elabed, L., Makki, M., Tariq, M., & Kusunoki, Y. "A Pilot Study of Reproductive Autonomy and Reproductive Health Outcomes of Arab American Women in Southeast Michigan." Poster presented virtually at the Population Association of America (PAA) Annual Conference in April 2020. Awarded the Population Association of America.* *Poster Award in the Reproductive Health and Family Planning Section.*

7. **Khan, A**., Eid, N., Elabed, L., King, E., Baddah, L., & Kusunoki, Y. "A community-based participatory research approach to investigating intimate partner violence and reproductive coercion among Arab Americans." Poster presented at the 2018 American Public Health Association Annual Meeting & Expo, November 10-14, 2018, San Diego, CA.

Chapter 1: Introduction

Immigrants have been entering the U.S. since its inception; however, predominant immigration flows have changed over time. The largest wave of immigrants arrived following the Hart-Cellar Act (Immigration and Nationality Act) when national origin quotas for immigration were repealed. Since then, U.S. immigration has been dominated by people from Asia and Latin America, rather than Europe, and influenced major changes in migratory flows, policies, and even public opinion toward immigrants.

Two pan-ethnic communities that have grown considerably since 1965 are the Middle Eastern North African (MENA) and South Asian immigrant communities (Bhandari, 2022; Harjanto & Batalova, 2022). In addition to making up nearly 5% of the U.S. population (Arab American Institute Foundation, 2018; US Census Bureau, 2017; South Asian Americans Leading Together (SAALT), 2019), MENA and South Asians have established prominent ethnic networks throughout the country. Despite being nationally, regionally, ancestrally, and linguistically different, MENA and South Asians share similar resettlement contexts, migration histories, cultural beliefs and institutions, and even experiences with discrimination and racialization (Basu, 2016; Cainkar, 2018; Hashad, 2003; Sekhon, 2003). For example, following 9/11, both MENA and South Asians experienced record levels of hate crimes and violence (Budiman, 2020). Immediately following 9/11, at least 500 hate crimes and 91 cases of simple and aggravated assaults against Muslims, MENA and South Asians were reported to the FBI (Kishi, 2017). Following enactment of the 2001 USA Patriot Act1, another 1,000 foreign nationals from the MENA and South Asian nations were arrested (Budiman, 2020). Other groups

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1 The USA Patriot Act deterred and punished terrorist acts in the United States and around the world, to enhance law enforcement investigatory tools, and for other purposes . This act was used to justify the heightened surveillance of Muslim communities and community centers (Ahmed & Senzai, 2004).

suffered after 9/11 included immigrants from Mexico, Central America, South America, the Caribbean, and all over Asia (Passel & Cohn, 2014) who were targeted in debates related to illegal immigration and visa overstays. A nascent but growing literature has even indicated that these events have had adverse effects on the health of immigrants and a "chilling effect" on the psyche of immigrants from MENA and South Asian backgrounds and those with insecure citizenship status Quesada et al., 2011). For example, studies on MENA and South Asian Americans found that experiences including racial bias and discrimination from providers were associated with negative experiences in the healthcare setting (Martin, 2015; Reitmanova & Gustafson, 2008), and the restrictive immigration policy the 2017 "Muslim Ban was associated with forgoing care (Samuels et al., 2021) and incidence of preterm birth (Samari et al., 2020). Among immigrant women of reproductive age, studies find that immigration status is the primary barrier to healthcare access and SRH services (Hasstedt et al., 2018)

In this dissertation, I explored factors that have shaped the health of immigrant populations who were deeply affected by the post-9/11 anti-immigrant sociopolitical climate, including MENA, South Asians and immigrant women of varied citizenship statuses. In each study I examine different aspects of the receiving contexts of these immigrant groups and how they implicate health access and SRH. In Aims 1 and 2, I explored the neighborhood context that MENA and South Asian immigrants resettle into (Aim 1) and how these environments shape their health access (Aim 2). In Aim 3, I focus on how citizenship status shaped immigrant women's SRH. Additionally, each study was set within the state context of California. Next, I provide a brief summary of each study.

Aim 1: In the first study, I develop a typology that organized MENA and South Asian ethnic neighborhoods in California according to their social and economic dimensions (i.e. co-

ethnic density, foreign-born density, and socioeconomic status). This study is a quantitative study that uses cross-sectional data from the 2020 American Community Survey (ACS). The data indicated that MENA and South Asian Americans in California are primarily spread across the metropolitan areas of Northern and Southern California; MENA were primarily concentrated in the Southern Californian regions of Los Angeles, Orange County, and San Diego, and South Asians were largely concentrated across the Bay Area. The study also indicated that MENA and South Asian Americans in California who lived in co-ethnic neighborhoods, or neighborhoods where there is a high density of individuals of the same ethnic identity, resettled four types of ethnic neighborhoods including the disadvantaged immigrant co-ethnic neighborhoods, disadvantaged integrated co-ethnic neighborhoods, advantaged immigrant co-ethnic neighborhoods, and advantaged integrated co-ethnic neighborhoods. Finally, there were notable differences in the sociodemographic, migration, socioeconomic, and health access characteristics among MENA and South Asians by neighborhood context.

Aim 2: In the second study, I examined the effects of neighborhood context on health insurance status (outcomes: any health insurance and private health insurance vs. public health insurance) among MENA and South Asian Americans aged 18 and older in California. This study used cross-sectional data from the 2020 American Community Survey (ACS). The study indicated that neighborhood context was an important indicator of MENA and South Asian health insurance status. The results also suggest that certain aspects of the neighborhood were more important than others for predicting MENA and South Asian Americans health insurance status. For example, foreign-born density was an important predictor of having any health insurance among South Asian Americans. Among MENA Americans, neighborhood

socioeconomic status was associated with private health insurance and co-ethnic density was associated with private health insurance among South Asian Americans.

Aim 3: The final study examined if citizenship status was associated with use of a reversible method of contraception in the past 12 months among cis-gender, heterosexual women between the ages of 18-44 in California who were at risk of becoming pregnant (i.e., sexually active with at least one male sexual partner in the past 12 months, could become pregnant, and did not plan to become pregnant in the next 12 months). This study used secondary data from the 2017-2020 waves of the California Health Interview Survey (CHIS). The data show nativity and citizenship status were significantly associated with contraception use before adjusting for other covariates. Though the associations were no longer significant upon adjusting for other covariates, there were notable bivariate differences in *type* of contraception method used in the past 12 months where legal permanent residents (LPRs) had the highest levels of permanent method use, non-citizens without a green-card had the highest condom use, and U.S.-born citizens had the most LARC use.

In the following chapters I review literature on MENA and South Asian Americans migration, the importance of citizenship status on the lived experiences of immigrants, the relevance of migration for health research, literature on MENA and South Asian American health, and how citizenship may be tied to immigrant SRH and contraception use (Chapter 2). In Chapter 3, I describe the theories that inform each aim within this dissertation. In Chapter 4 I review the aims and sub-aims of each aim and their respective hypotheses. Then, I discuss the study context and design (Chapter 5). In the three empirical chapters of the dissertation (Chapters 6-8), I present the methods and results of each study, followed by a discussion of the findings.

Finally, I conclude with a discussion of the overall findings and implications of this dissertation (Chapter 9).

Chapter 2: Background

In this chapter, I describe important background on the populations of interest within each study of this dissertation including MENA and South Asian Americans, and then immigrants with respect to their citizenship status. Next, I summarize why the experience of migration is important for understanding immigrant health. Finally, I delve into relevant background for each dissertation study, including what is known about MENA and South Asian American health and health access, the role of the neighborhood in shaping MENA and South Asian American health, how citizenship status may influence contraception use, and finally the concept of racialized legal status, which may shape how citizenship status effects SRH among different racial/ethnic groups.

Background on MENA and South Asian Americans

Over 2 million MENA and 5 million South Asians live in the U.S. and make up nearly 5% of the U.S population. MENA Americans trace their national origins to twenty-three countries[2] (Abuelezam et al., 2018; Khalil et al., 2020) and South Asians to eight (i.e. Afghanistan, Bangladesh, Bhutan, India, Myanmar (Burma), Nepal, Pakistan, Sri Lanka (Ceylon)) (South Asian Americans Leading Together (SAALT), 2019). The twentieth century witnessed significant growth of the MENA and South Asians population in the U.S. for several reasons, including the rise and fall of British colonialism in the MENA region and South Asia (*Echoes of Freedom: South Asian Pioneers in California, 1899-1965*, 2020), immigration-related

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2 Bahrain, Iraq, Iran, Israel, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, Syria, the United Arab Emirates, Yemen; North Africa: Algeria, Egypt, Libya, Mauritania, Morocco, Somalia, Sudan, Tunisia.

policy changes including the Luce-Celler Bill of 1946[3] and Hart-Celler Act of 1965[4] (also known as the Immigration and Nationality Act), and wars in the region including the Lebanese Civil War (1975-1990), the 1967 Six-Day War, and the 1979 Iranian Revolution, the U.S. war in Afghanistan (2001-2021), and the Iraq War (2003-2011) (Foad, 2013; Little, 2022; Immigration and Ethnic History Society, 2019; Little, 2022; Chishti et al., 2015; *Echoes of Freedom: South Asian Pioneers in California, 1899-1965*, 2020). Visa programs of the late twentieth century, including the 1990 Diversity Immigrant Visa program and the H-1B skilled worker visa program[5] also brought a steady wave emigration from the MENA region and South Asian (*Echoes of Freedom: South Asian Pioneers in California, 1899-1965*, 2020).

As the MENA and South Asian population in the U.S. grew, so did stereotypes, prejudice, and discrimination toward these groups. For example, MENA and South Asians are often cast as "model minorities" (Jin, 2021) because of the positive effects that their educational attainment and socioeconomic status has given them in terms of their social positioning in comparison to other immigrant groups (Raghupathi & Raghupathi, 2020). Following 9/11, however, MENA and South Asians also faced intense levels of Islamophobia (defined as the "unfounded hostility towards Islam and a fear or dislike of all or most Muslims" (Runnymede, 1997)). Both stereotypes have been harmful for these groups; first, the "model minority" myth generalizes the experiences of MENA and South Asians into a singular, narrow narrative and obscures differences across MENA and South Asian subgroups (Jin, 2021), while the latter feeds

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[3] Along with the Repeal of Chinese exclusion in 1943, the Luce-Celler Act further undermined Asian exclusion and emphasized foreign relations over racial discrimination by extending naturalization rights and immigration quotas to other key U.S. allies in Asia, the Philippines and India. The Philippines gained independence from the United States in 1946 as did India from Great Britain (*Luce-Celler Act of 1946*, n.d.).

[4] The Hart-Celler Act abolished national quotas on migration and created a preference system that focused on skills and family reunification (Chishti et al., 2015).

[5] The Immigration Act of 1990 allowed employers to hire skilled workers using temporary visas ("Immigration Act of 1990," n.d.).

into a narrative that these populations are inherently regressive, barbaric, anti-Western, and terrorists (Said, 1978). Though most South Asians, particularly Indians, may indeed be high-earning and socioeconomically advantaged (Jin, 2021), there are disparities in socioeconomic status across South Asian sub-groups. MENA Americans are also more likely to be unemployed and have lower household incomes compared to U.S.-born natives (Cumoletti & Batalova, 2018). Several thousands of MENA and South Asians in the U.S. are also refugees ; Baugh, 2020) and even on undocumented or DACA status (Warren, 2019; *Approximate Active DACA Recipients: Country of Birth As of August 31, 2018*, 2018). Despite the perceived collective success of MENA and South Asians, there are immigrants from these regions who are not only struggling socioeconomically, but are also substantially affected by racism and discrimination (Chow, 2017). Immediately following 9/11, over 500 hate crimes and 91 cases of simple and aggravated assaults against Muslims, MENA and South Asians were reported to the FBI (Kishi, 2017). Additionally, after the U.S. enacted the 2001 USA Patriot Act[6] as a part its efforts to counter terrorism, over 1,000 foreign nationals from MENA and South Asian nations were arrested (Budiman, 2020). Hate crimes, FBI surveillance, and anti-Muslim and Arab policies that followed 9/11 have had a chilling effect on the psyche of MENA and South Asian Americans (Ahmed & Senzai, 2004; Mishra & Lokaneeta, 2021; Samari, 2016). These experiences fall under the definition of Islamophobia and are theoretically expected to impact the health of MENA and South Asian Americans (Samari, 2016) just as provider-bias, discrimination in immigration policies, and restrictions on healthcare shape the health of other racial/ethnic

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6 The USA Patriot Act deterred and punished terrorist acts in the United States and around the world, to enhance law enforcement investigatory tools, and for other purposes . This act was used to justify the heightened surveillance of Muslim communities and community centers(Ahmed & Senzai, 2004).

minorities (Desai & Samari, 2020; Jones, 2012; Kim et al., 2016; Novak et al., 2017; Tapales et al., 2018; Toomey et al., 2014).

<u>The role of citizenship status on the lived experiences of immigrants</u>

Surveillance through immigration enforcement officials and anti-immigrant policies have had chilling effects on other immigrant groups as well. Immigration policies such as the Illegal Immigration Reform and Immigration Responsibility Act of 1996, for example, increased immigration enforcement at the border and measures for worksite deportation and detention practices, and created stricter criteria for admissibility into the U.S. and eligibility for public assistance programs for recent legal permanent residents (LPRs) and undocumented immigrants (Cohn, 2015). Since then, each presidential administration has removed millions of immigrants, including 12 million under President Clinton, 10 million under President Bush, 5 million under President Obama, and 3 million under President Trump (Chishti et al., 2017; Gramlich, 2020). Under the Trump administration, many authorized immigrants were also discouraged from enrolling in public assistance programs even if they were eligible out of fears of losing their path to citizenship on "public charge" grounds (Fremstad, 2018; Rosenbaum, 2019).

As of 2019, approximately 23 million immigrants (52%) were naturalized citizens, 8 million were eligible for citizenship, and 11 million were undocumented (*Augmented IPUMS-ACS Data, as Published in "State-Level Unauthorized Population and Eligible-to-Naturalize Estimates,"* n.d.; *Immigrants in the United States*, 2021; *Profile of the Unauthorized Population: United States*, n.d.). Most undocumented immigrants in the U.S. have arrived from Latin America, but another 17%, or 2 million, are of Asian origin including from India (35% of undocumented Asians), China (20%), the Philippines (10%), South Korea (8%), Vietnam (6%), Pakistan (3%), Nepal (2%), Thailand (2%), Afghanistan (2%), and Bangladesh (1%) (Millet,

2022). The anti-immigrant sociopolitical climate has made it increasingly difficult for immigrants to feel safe, find jobs, and even access social benefits and healthcare. Furthermore, while these policies, as written, appear "race-neutral" (Asad & Clair, 2018) they have created a hostile environment for anyone who is perceived to be an immigrant because of their skin color, language, or any other characteristic that could be used to conflate ethnicity and legal status (Gee & Ford, 2011; Viruell-Fuentes et al., 2012). In fact, one of the unintended consequences of immigration policies is that they reproduce ideologies that define belonging and deservingness in the U.S. upon racial and ethnic lines (Gee & Ford, 2011).

Today's migration context disproportionately marginalizes Black and Latinx people in immigration enforcement practices like surveillance, detention, and deportation (Asad & Clair, 2018; Pager & Shepherd, 2008; Rosenblum & McCabe, 2014). In fact, despite making up only two-thirds of the undocumented population, 95% of those who were detained or deported during the Trump Administration were Latinx (Asad & Clair, 2018; Pager & Shepherd, 2008; Rosenblum & McCabe, 2014; Menjívar et al., 2016). In some cases, authorized immigrants have been wrongfully detained and persecuted under the current immigration enforcement system (Asad, 2017; Golash-Boza & Hondagneu-Sotelo, 2013). The unauthorized Asian population in the U.S. has also grown due to visa overstays among Chinese, South Korean, and Indian Americans (Weston Phippen & National Journal, 2015). In addition to being targeted by immigration officials, undocumented Asian immigrants report feelings of shame, stigma, government mistrust, isolation from their support networks, and loss of access to health services (Rusin, 2015). The Research on Immigrant Health and State Policy survey from 2018 and 2019 indicated that among Asian and Latinx immigrants in California encounters with immigration enforcement have been associated with delays in care (Young et al., 2023). Citizenship and legal

status, coupled with race/ethnicity, are likely to increase barriers to health access and use of sexual and reproductive health services including contraception (Hasstedt et al., 2018). In the next section, I will discuss how the aspects of migration process may shape MENA and South Asian health access and how citizenship and legal status may implicate women's contraception use.

Perspectives on migration and health

Most studies that explore immigrant health focus on the role of behavioral and cultural factors. Studies which use behavioral frameworks to understand immigrant health focus on behavioral choices related to health service utilization (Garcés et al., 2006; G. Kim et al., 2010), cancer risk behaviors and screening (Borrell et al., 2006; Mayo et al., 2003; Wu et al., 2006), chronic disease (Chakraborty et al., 2003; Juarbe et al., 2003; Leake et al., 2012), and mental health (Barry et al., 2020; G. Kim et al., 2010), or individual level behavioral change theories such as the Health Belief Model (Pasick & Burke, 2008). These studies perpetuate the idea that personal responsibility, self-esteem, and self-efficacy of the individual are the main mechanisms for behavior change rather than investigating contextual drivers of immigrant health behaviors like their social or policy environments or economic opportunities. Cultural frameworks have also been used to understand mental health (Bacallao & Smokowski, 2005; Costigan et al., 2010), chronic disease (Batis et al., 2011; Edelman et al., 2009; Singer, 2001), healthcare access (J. Y. Choi, 2009), maternal and child health (Campos et al., 2008; Pilver et al., 2011; E. K. Wilson, 2008), substance use (Vasquez et al., 2011), physical activity and obesity (Liu et al., 2009), and social capital (Almeida et al., 2009; Bhattacharya, 2008, 2011). Most studies that use a cultural framework assume that immigrants are "acculturating" or moving toward behaviors that adapt to the dominant group, which can have negative consequences for health including

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engagement in health risk behaviors, poor diet, smoking, and low use of health services (Castañeda et al., 2015). In some cases, researchers have reframed culture as a protective factor for health and beneficial for maintenance of cultural patterns (Bacallao & Smokowski, 2005). However, even this framing implies that immigrants are a homogenous group. Finally, studies that are based on cultural frameworks often neglect to define "acculturation" clearly or they measure acculturation using arbitrary, inconsistent, and oversimplified measures (Hunt et al., 2004; Minnis et al., 2010; Poureslami et al., 2007; Viruell-Fuentes et al., 2012)**.** Finally, cultural frameworks often conflate ethnicity and culture despite the historical, sociopolitical, and geographic differences within the same racial/ethnic group (Viruell-Fuentes et al., 2012). Consequently, immigrants within a certain racial/ethnic category become viewed as homogenous instead of through consideration of their unique histories, contexts of migration, class, legal status, socioeconomic status, and interaction with other immigrant subgroups.

Overreliance on behavioral and cultural explanations obscure how exclusionary policies and practices, resettlement and residential patterns, and healthcare cost reproduce social inequality and health inequities (Link & Phelan, 1995, 1996, 2002; Phelan et al., 2010). Studies that use a structural framework have indicated that immigration status, living and working conditions, and the constant threat of deportation and detention are directly associated with health access and health outcomes (Castañeda et al., 2015). For example, studies show that immigrants, especially undocumented immigrants, are vulnerable in regard to their healthcare access (Derose et al., 2007; Ortega et al., 2007; Vargas Bustamante et al., 2012). This may be due to national and local policies around health access and immigration enforcement, housing conditions, neighborhood safety, and lack of labor protections which keep immigrants from using health-related resources and services (Castañeda et al., 2015). Studies have also shown that

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the stress of racial discrimination, lack of legal status, and policy exclusions of immigrants have negative consequences for health, including depression (Grzywacz et al., 2010; Heptinstall et al., 2004; Lindert et al., 2009) and low self-worth (Quesada et al., 2011).

To date, few studies have explored how structural factors pertaining to the migration experience shape health access among MENA and South Asian immigrants. For example, although MENA and South Asians may benefit from their "highly educated immigrant" and "model minority" status (Jin, 2021), they are still susceptible to anti-immigrant discrimination and policies including workplace challenges related their visas (Abdel-Aziz et al., 2020; Lertora & Croffie, 2020; Morey et al., 2020; Obinna, 2014) and Islamophobic policies, which create additional stress and barriers to health access (Samari, 2016; Desai & Samari, 2020; Jones, 2012; Kim et al., 2016; Novak et al., 2017; Tapales et al., 2018; Toomey et al., 2014). Historic, social, socioeconomic heterogeneity within MENA and South Asian immigrant communities may also account for diverse experiences in relation to their health access.

Immigrant women also face barriers to healthcare coverage and use of sexual and reproductive health services including contraception (Hasstedt et al., 2018). At the structural level, these barriers include local, state, and federal policies, legal status, stigma, marginalization and medical mistrust, and residential context (Health Insurance Coverage and Access to Care for Immigrants: Key Challenges and Policy Options, 2021). Other social positions that immigrant women inhabit including their race/ethnicity, gender, or socioeconomic status, may also shape their lived experiences within an anti-immigrant sociopolitical climate and, in turn, influence their access to SRH and contraception. In the next section, I will review the literature on MENA and South Asian health and health access and identify gaps within this research. Then, I will review literature on immigration policies and citizenship status and contraception use.

<u>MENA and South Asian American health and health access</u>

The literature on MENA and South Asian American health indicates that immigrants from these backgrounds are at risk of adverse health outcomes and face barriers to health access. MENA Americans are at risk of tobacco and nicotine dependence (Al-Omari & Scheibmeir, 2009), low physical activity and diabetes (Aqtash & Van Servellen, 2013; Kahan, 2007, 2011), mental health disorders (Abdulrahim et al., 2012; W. Abu-Ras & Abu-Bader, 2008; Aloud & Rathur, 2009; Amer & Hovey, 2012; Awad, 2010; Ellis, Lincoln, et al., 2010; Ellis, MacDonald, et al., 2010; Goforth et al., 2014; Jaber et al., 2003; Jamil et al., 2002; Martin, 2015; A. E. Norris et al., 2011; Padela & Heisler, 2010; E. M. Taylor et al., 2014), intimate partner violence (IPV) victimization (Abu-Ras, 2003; Barkho et al., 2011; Khan et al., 2021), vaccine hesitancy (Dallo & Kindratt, 2015), and poor obstetric and prenatal care (El-Sayed & Galea, 2010; Hyder & Barnett, 2021; Johnson-Agbakwu et al., 2014; Samari et al., 2020). Various factors have been attributed to these health risks. Lack of treatment and management of diabetes among MENA Americans, for example, is reported to be associated with language barriers, negligence, lack of awareness, dislike of physicians and/or medications, transportation, and lack of health insurance (Bertran et al., 2015). Acculturation was reported to be positively associated with tobacco dependence, and youth physical activity (Kahan, 2007), but negatively correlated with nicotine dependence (Al-Omari & Scheibmeir, 2009), being overweight and low physical activity among girls (Kahan, 2007). IPV victimization in the MENA American community has been attributed to several factors including community norms, fear and shame, lack of knowledge of existing resources, language barriers between services and providers, and lack of informal support (Abu-Ras, 2003; Khan et al., 2021). Furthermore, MENA women have reported that the fear of

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promoting negative stereotypes about MENA Americans and amplifying Islamophobia discourages people from disclosing or seeking support services (Khan et al., 2021).

Cultural norms (Abu-Ras & Abu-Bader, 2008; Awad, 2010; Ellis, Lincoln, et al., 2010) and lack of culturally competent mental health services are also barriers to counseling and psychotherapy among MENA Americans (Abu-Ras & Abu-Bader, 2008). However, some studies on the mental health of MENA Americans also report discrimination as a barrier to mental health service use (Abdulrahim et al., 2012; A. E. Norris et al., 2011; Padela & Heisler, 2010). For example, the 2003 Detroit Arab American Study (DAAS; N=1016) indicated that discrimination was most prevalent among Muslim Arab Americans (overlap with MENA in this study), who self-reported their race as non-white and residents of ethnic enclaves, and that the association between discrimination and psychological stress was stronger among Christian Arabs, those with dark skin color, and those who did not live in an ethnic enclave (Abdulrahim et al., 2012). DAAS also indicates that discrimination related to 9/11 was associated with increased psychological distress, reduced levels of happiness, and worse health status among Arab or Chaldean adults in Southeast Michigan (Padela & Heisler, 2010). Another study, which used the Demands of Immigration Scale (DI)—a 23-item measure of immigration stressors related to loss, not feeling at home, novelty, occupation, language, and discrimination (Aroian et al., 1998)—found that post-migration stressors were positively associated with comorbid post-traumatic stress disorder (PTSD) and major depressive disorder (MDD) (A. E. Norris et al., 2011). For MENA Americans, discrimination has also been associated with negative experiences in the healthcare setting (Martin, 2015), including maternity settings (Reitmanova & Gustafson, 2008), and negative birth outcomes (Samari et al., 2020). Two studies, for example, found that the 2017

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"Muslim Ban" had adverse effects on preterm birth (Samari et al., 2020) and forgoing healthcare (Samuels et al., 2021).

Among South Asians, data on health disparities is even more limited. First, health data group South Asians with other Asian Americans instead of as their own racial/ethnic group even though they represent the majority of Asian Americans in several states including Texas, New Jersey, and Florida (2018 State Factsheet Florida, n.d.; Hanna & Batalova, 2020; Yi, 2020). The few studies that have assessed South Asian American health examine mental health (Masood et al., 2009; Tirodkar et al., 2011), IPV victimization and response (Hurwitz et al., 2006; Raj et al., 2005; Raj & Silverman, 2002, 2003, 2003; Tripathi & Azhar, 2022), and heart disease (Guadamuz et al., 2021; Pursnani & Merchant, 2020; Tirodkar et al., 2011; Worth et al., 2009). Most studies on South Asian mental health discuss lifetime mood and anxiety disorders and gender differences in factors that cause negative mental health including lack of family support for women and family and cultural conflict and social position among men (Masood et al., 2009). Other studies have reported that acculturative stress, which encompasses a broad scope of experiences including intergenerational conflict and discrimination, was associated with depression among foreign-born South Asians and their children (Bhattacharya & Schoppelrey, 2004; Inman et al., 2007; Kaduvettoor-Davidson & Inman, 2013; Rahman & Rollock, 2004; Samuel, 2009). IPV survivors of South Asian origin are also likely to report poor physical and mental health outcomes (Hurwitz et al., 2006), reduced sexual autonomy, increased risk for unwanted pregnancy, and increased likelihood of having multiple abortions (Hurwitz et al., 2006; Raj et al., 2005; Raj & Silverman, 2002, 2003, 2003; Tripathi & Azhar, 2022).

Existing literature on MENA and South Asian American health has some major limitations. First, the literature does not have one consistent and cohesive way of defining

MENA and South Asian Americans. As such, the scope of generalizability of studies that focus

on MENA and South Asian Americans is unclear. Another limitation of existing literature on

MENA and South Asian Americans is that, in most cases, the samples are not randomly selected,

and instead, are a self-selected convenience sample that are relatively small. Additionally,

notably few studies on MENA and South Asian American health draw meaningful comparisons

with the general U.S. population or other racial/ethnic groups, and those that do demonstrate

mixed results. For example, three studies indicated better birth outcomes for birth weight,

preterm birth and infant mortality among MENA American women in metro Detroit compared to

non-Hispanic U.S.-born Whites (El Reda et al., 2007; El-Sayed & Galea, 2009a; Finkton et al.,

2013), while a national, population-level study indicated significantly higher risk of preterm birth

among MENA American women compared to U.S.-born whites (Samari et al., 2020).

Additionally, the Mediators of Atherosclerosis in South Asians Living in America

(MASALA) Study, which is the first longitudinal study of U.S.-based South Asians to examine

factors that lead to heart disease and guide prevention and treatment of heart disease in this

population, found that compared to other ethnicities, South Asians are at higher risk of type 2

diabetes (Kanaya et al., 2014) and cardiovascular related hospitalization and mortality (Hughes

et al., 1989; Jha et al., 1993; Jose et al., 2014; Klatsky et al., 1994; Palaniappan et al., 2004;

Vafaei et al., 2023; Volgman et al., 2018). Finally, studies that attempt to examine effects

between Islamophobia and health-seeking behaviors in Muslim American samples (include but

are not exclusively MENA and South Asian American) often report null associations between

Islamophobia and health or associations that counter the theorized relationship between

Islamophobia and health (Padela et al., 2014, 2015). For example, a cross-sectional survey of

Muslims in Chicago (N=240) indicated that discrimination was not associated with obtaining

Pap smears (Padela et al., 2014), and negatively linked to obtaining a regular mammogram

screening (Padela et al., 2015). However, these studies also indicate other factors associated with

women's health screenings among Muslim women including years of residency in the U.S. and

having a healthcare provider (Padela et al., 2015)

Most studies that have attempted to compare MENA and South Asian American health

outcomes with other racial/ethnic group are set in some of the most densely populated

metropolitan contexts for MENA and South Asian resettlement, including metro Detroit and the

Greater Chicago area (El-Sayed & Galea, 2009; Inhorn, 2016; Padela et al., 2014, 2015). In

addition to being densely concentrated in these areas, MENA and South Asian Americans also

tend to have higher incomes and live in middle class or affluent neighborhoods when compared

to non-MENA or South Asian immigrant populations and even U.S.-born whites in the same area

(Logan & Stults, 2011). With the heavy focus on MENA and South Asian Americans in U.S.

metros, past studies on MENA and South Asian American health are limited in their

generalizability for MENA and South Asian Americans who live in other geographic contexts.

Therefore, to understand health among MENA and South Asian Americans, it is important to

account for differences in geographic and socioeconomic contexts. In the next section, I discuss

ways that neighborhood context could add another layer to understanding MENA and South

Asian immigrant health.

Neighborhood context and health

The neighborhood serves an important context for the experiences of immigrants in the

receiving society. Sociologists describe the neighborhood as a subdivision of urban or rural

locations such as cities, villages, and towns that are defined by their physical and psychosocial

characteristics (Berk, 2005). These physical and psychosocial characteristics are shaped by the

people who live there, their location, existing systems of interaction and engagement, shared identities, and public symbols (Keller, 1968; Schwiran, 1983). These characteristics can shape individuals' access to 'material and infrastructural resources' (Macintyre et al., 2002) , "opportunity structures", and opportunities for building social relationships (Macintyre et al., 2002; Kellekci & Berköz, 2006).

For immigrants, the *ethnic neighborhood,* sometimes referred to as an ethnic enclave, is a geographic area with high ethnic concentration, a specific cultural identity, and economic activity (Hummon, 1996; Portes & Zhou, 1993; Sanders & Nee, 1992; Wilson & Portes, 1980; Zhou, 2009). Ethnic enclaves were originally studied with respect to the inner city Cuban immigrant neighborhoods of Miami, Mexican immigrants communities of Texas and California (Portes & Bach, 1985; Portes & Jensen, 1992), and Old Chinatowns (Zhou, 2009). These neighborhoods provided an important context for social engagement and integration, strategic resources, and multidimensional supports (i.e. for finding jobs and housing, and addressing financial and material needs) among their immigrant residents (Nee & Sanders, 2001a, 2001b; Campbell & McLean, 2002) and helped communities build trust, cohesion (Iwamoto & Liu, 2010; Mossakowski & Zhang, 2014; Pettigrew et al., 2011), social capital, and immigrant networks (Nee & Sanders, 2001a, 2001b; Campbell & McLean, 2002). These ethnic neighborhoods are often preferred resettlement contexts for newly arrived immigrants since they provide them with affordable housing, economic activity, and co-ethnic social and professional networks (Hummon, 1996; Iceland & Scopilliti, 2008; Portes, 1981; Portes & Bach, 1985; Portes & Jensen, 1992; Wilson & Portes, 1980; Zhou, 1992).

More recently, research on Asian Americans demonstrates that Asian ethnic neighborhoods may be quite different from Latinx and Black neighborhoods with respect to their

social and institutional resources (Logan & Stults, 2011). Additionally, these neighborhoods are known for having a heightened presence of affluent and well-educated community members, and high quality neighborhood institutions, including churches, voluntary organizations, and service programs, which facilitate opportunities for building social relationships and improving individual well-being (Browning & Cagney, 2003). These neighborhoods are more commonly known as "ethnoburbs", or post-suburban neighborhoods largely popularized by East Asian immigrants, which have low exposure to poverty, high household incomes, and better access to culturally-tailored institutional resources, even when compared to integrated neighborhoods (Li, 2008; Trinh Vo & Yu Danico, 2004; Wen et al., 2009; Zhou & Kim, 2006). These neighborhoods provide immigrants a place to live where they are able to experience upward socioeconomic mobility and high levels of social capital while maintaining their cultural identity and decreasing the need to assimilate to the cultural norms of the host society (Zhou, 2007; Zhou & DiRago, 2023).

Ethnic neighborhoods also provide immigrants a socializing agent for beliefs and knowledge related to illness and health-seeking behavior, and provide access to social and health services, translation and transportation services, and advice for health care decision making that complement the socioeconomic means and cultural or linguistic needs of the ethnic community (Doherty & Campbell, 1988; Doherty & McCubbin, 1985; Kawachi et al., 1996, 1997; Kawachi & Berkman, 2014; Leclere et al., 1994; C. E. Ross et al., 1990). One study of Korean, Filipino, and Marshallese immigrants in Hawaii, for example, reported that societal context, respondents' ethnicity, social capital (i.e. perceptions of trust, cohesion, reciprocity, and involvement within one's ethnic community), community participation and access to individual support networks with family/relatives, co-ethnic friends, local (non-ethnic) friends, and neighbors), impacted

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healthcare access (J. Y. Choi, 2009). Another study of Haitian and Cuban refugees in Florida found that living in a favorable context of reception, or an area with a co-ethnic community and strong support network made up of kin, people of similar national origin, or supervisor and co-workers of the same ethnic identity, was associated with greater use of local mental health services (Portes et al., 1992). One study on Hispanic immigrants, however, indicated living within a co-ethnic neighborhood was negatively associated with having health insurance (Cebula, 2006). While these studies indicate major ways in which the neighborhood can shape immigrant health, they also point to differential patterns that neighborhood context can have on health, depending on the immigrant group in question. For example, the health effects of the co-ethnic neighborhood among Asians who live in ethnoburb, may be quite different from the effects of an ethnic enclave on Black and Latino immigrant health (Kandula et al., 2009; Mason et al., 2011; Walton, 2009).

For MENA and South Asian Americans, metropolitan areas of California, Michigan, New York, Texas, Illinois, New Jersey, and Washington, D.C. serve as the most common residential contexts (Arab American Institute Foundation, 2018; Budiman & Ruiz, 2021; US Census Bureau, 2017). MENA and South Asian communities which have been established in these states have sometimes been described as "*ethnic enclaves*". There is also a growing presence of MENA and South Asians in suburban areas across many U.S. and Canadian metropolises including the suburbs of Detroit (Arab, Chaldean, and Middle Eastern Children and Families in the Tri-County Area, 2004), Orange County, Minneapolis and St. Paul (Roble & Rutledge, 2008), and the Greater Toronto Area (GTA) (Qadeer & Kumar, 2006) which may be more comparable to the Asian American "*ethnoburbs*" (Lin, 1998; Walton, 2012). Most studies on MENA American and South Asian American health access do not account for the ways that

their residential context could influence their health. Therefore, through ***Aim 1*** and ***Aim 2*** of this dissertation, I explored 1) the neighborhood context of MENA and South Asian immigrants within a specific state context (California) and 2) assessed the role of neighborhood context as a determinant of their health access.

<u>Citizenship status and contraception use</u>

Immigration policies and citizenship status are another set of structural factors that shape immigrant health. Citizenship status reproduces ideologies and processes that define belonging and deservingness for residency and rights in the U.S. (Gee & Ford, 2011). Through these grounds, citizenship status confers individuals in the U.S. with differential degrees of legal protection, access to political, labor market, and social opportunities (Bosniak, 2008) and vulnerability to immigration enforcement actions (Asad & Clair, 2018). California itself is home to 10.5 million immigrants (Perez, Mejia, et al., 2021), and within this population 78% are either naturalized citizens or present with legal documentation such a green cards (LPRs) or temporary visas, while 22% are undocumented (Perez, Mejia, et al., 2021). For those immigrants who are on discretionary, temporary or undocumented status, the barriers to healthcare are many and may stem from experiences with housing discrimination, limited civil and labor protection, and constant threat of detention and deportation (Hall & Greenman, 2013; McConnell, 2015; Jones-Correa & De Graauw, 2013). Through these mechanisms, citizenship status may also be linked with immigrant women's access to healthcare and SRH (Hasstedt et al., 2018). For example, in 2016, 34% of 6.4 million reproductive aged noncitizen immigrant women were reported to be uninsured compared to 9% of U.S.-born women (Sonfield, 2018). Another study found that from 2006-2019, 35% of 15-44 year-old foreign-born women were using contraceptive care compared to 42% of U.S.-born women (Frost et al., 2021b). In the same year, a nationally representative

study from Guttmacher found that within a patient population that sought care at Title X–funded health centers, immigrants were significantly more likely to report not seeking or having insurance coverage compared to those who were U.S.-born (Hasstedt, 2017; Kavanaugh et al., 2018). Foreign-born women in this study also indicated that their immigration status was their primary reason for not seeking healthcare coverage (Kavanaugh et al., 2018). Similar trends have been observed among legal permanent residents (LPRs) who, in nationally-representative data from the Current Population Survey (CPS) reported that they avoided enrollment in Medicaid in response to enactment punitive immigration policies (Watson, 2014). Even when immigrant women had health insurance, one in five did not plan to use it because of real or perceived threats related to their documentation status and language and logistical barriers (Kavanaugh et al., 2018).

Within the state of California, there may be fewer barriers to SRH care compared to other states. For example, in most states, Medicaid and the Children's Health Insurance Program (CHIP), which are two state-administered public health coverage programs funded by the federal and state government that provide healthcare coverage to millions of eligible low-income adults, children, pregnant women, elderly, and people with disabilities, place restrictions on eligibility based on citizenship status and years of residency in the U.S.. In most cases, lawfully present immigrants must have a "qualified" immigration status to be eligible for Medicaid or CHIP, and then wait five years after obtaining their qualified status to enroll (Kaiser Family Foundation, 2023a).

California, however, allows exceptions to these rules. In California, Medicaid and CHIP are available to pregnant women and girls and children who were lawfully residing immigrants for less than 5 years (Hasstedt et al., 2018a). Additionally, since May 2016, free and low-cost

state health insurance has been available to non-citizens aged 19 and younger through the state funded healthcare program Medi-Cal (*Medi-Cal Expansion Provided 286,000 Undocumented Californians With Comprehensive Health Care*, 2022). In January 2020, a full scope of Medi-Cal was extended to young adults under 25 years, regardless of their citizenship or legal status (*Medi-Cal Expansion Provided 286,000 Undocumented Californians With Comprehensive Health Care*, 2022).

Another state health program in California which has been instrumental for improving immigrant women's access to contraception is the Family Planning, Access, Care, and Treatment (Family PACT) program. This program has made comprehensive medical knowledge, assistance, and services related to family planning available to low income (under 200% federal poverty line (FPL)) residents in California since 1997 (*Family PACT*, n.d.). Today about 67% of Family PACT clients are Latina and 6.4% are Asian (*Family PACT*, n.d.). California also ensures access to specific family planning services to undocumented immigrants, like emergency contraception and pregnancy-related services through Medi-Cal (*Family PACT*, n.d.). Still, despite being one of the most inclusive health policy landscapes for immigrants, the most substantial options for subsidized healthcare for undocumented immigrants are only in Los Angeles, Sacramento, San Diego, and San Francisco County (Kelch, 2015).

Though California has several measures in place to reduce the barriers that immigrant women may face in accessing SRH, the Trump era may have undone some of these efforts. For example, just in the first few months of Trump's presidency, there was a 40% rise (30,028 to 41,318 arrests) in immigration enforcement and removal operations (*ICE ERO Immigration Arrests Climb Nearly 40%*, n.d.). Fears of deportability have also been reported as a reason that immigrant women avoid using preventative SRH services even when they had healthcare

coverage (White et al., 2017). Additionally, even though ICE detention and deportation practices disproportionately target Latino men (Menjívar et al., 2016; J. S. Passel & D'Vera Cohn, 2011), this may negatively impact immigrant women and their children who are at risk of losing a financial provider who assist them in managing the cost of their SRH services (Asad & Clair, 2018; Cervantes et al., 2018; Coleman-Minahan & Samari, 2018). Furthermore, attempts to disqualify individual's admission into the U.S. and adjustment to legal permanent residency status on the grounds of "public charge" kept many immigrants, including eligible families from enrolling in Medicaid and Medicare (Fremstad, 2018). For example, a study conducted in Boston, Minneapolis, and Little Rock found that the 2016 Presidential election and proposed "public charge" rule were associated with reduced well-child visit adherence among children of immigrants compared to children of U.S.-born parents (Ettinger de Cuba et al., 2023). Other studies find that the "public charge" rule was associated with increased odds of preterm birth among foreign-born Latinx birthing people who were uninsured (S. W. Choi, 2023), delay in prenatal Medicaid enrollment among immigrant mothers, and declines in birth weight among infants of immigrant mothers (S. S. Wang et al., 2022).

Finally, though immigrant women, overall, have lower rates of healthcare coverage and contraception use (Tapales et al., 2018b), immigrants tend to use publicly-funded SRH clinics more than U.S.-born individuals (Frost et al., 2021a). Under the "domestic gag rule", however, funding for Title X centers were significantly reduced (Dawson, 2021; Hasstedt et al., 2018). These funding cuts were expected to disproportionately hurt immigrant women since these clinics are among the few healthcare settings where immigrants were not required to present proof of citizenship or legal status (Dawson, 2021; Hasstedt et al., 2018).

<u>Racialized legal status and sexual and reproductive health</u>

In California nearly half (49%) of the immigrant population is Latinx, while 39% are Asian (Budiman & Ruiz, 2021) and within these two groups, the breakdown of citizenship status varies. Data from the 2019 California Immigrant Data Portal indicated that about 36% of Latino immigrants in California are naturalized citizens, 28% are LPRs and 35% are undocumented, while among Asian immigrants 63% are naturalized citizens, 27% are LPRs and 10% are undocumented (*California Immigrant Data Portal*, 2022). Racialized legal status refers to the practice in which immigrant enforcement officials conflate race or ethnicity with citizenship status and disproportionality target immigrants based on their skin color (Asad & Clair, 2018; Gee & Ford, 2011; Viruell-Fuentes et al., 2012). Similarly, Latinx individuals are disproportionately surveilled, detained, and deported by immigrant enforcement officials – despite making up only two-thirds of the undocumented population they comprise 95% of detainees and deportees (Asad & Clair, 2018; Pager & Shepherd, 2008; Rosenblum & McCabe, 2014; Menjívar et al., 2016). These immigration enforcement practices demonstrate how immigration enforcement in the U.S. is also racial project (Asad, 2017; Golash-Boza & Hondagneu-Sotelo, 2013). That is, despite their claim of being "race-neutral", immigration policies are known to reproduce ideologies and processes that define belonging and deservingness for residency and rights in the U.S. along racial and ethnic lines (Gee & Ford, 2011). This phenomenon is also known as "racialized legal status" which is the process by immigrant enforcement practices which target immigrants on the basis of their skin color, language, or any other characteristics that are used to conflate race or ethnicity with citizenship status (Asad & Clair, 2018; Gee & Ford, 2011; Viruell-Fuentes et al., 2012).

The racialized nature of immigration enforcement may influence the association between citizenship status and health outcomes among immigrants, including contraception use. One study of Latina immigrants in Alabama reported that due to fears of being stopped by the police and being deported they avoided going to a healthcare provider to obtain contraception (White et al., 2017). Another study found that though encounters with immigration enforcement were associated with delays in care for both Latinx and Asian Americans, encounters with immigration enforcement were higher among Latinx (Young et al., 2023).

Among Asian immigrants, becoming undocumented is often a consequence of visa overstays. When this happens, Asian immigrants lose access to healthcare services, become at risk of being targeted by immigration enforcement, and are isolated from their support networks (K. Ramakrishnan & Shah, 2017). Due to feelings of shame that accompany the loss of legal status, undocumented Asian Americans are less likely to enroll in programs that could improve their access to material and health resources. For example, reports from DACA indicate only 21% of DACA applicants are Asian American relative to 77% who are Latinx (Rusin, 2015) and even among Asians who are DACA eligible, only 13% use the program (Migration Policy Institute, 2018). These disparities may trickle down to their SRH access and contraception use. Data from 2017 indicated that approximately 10% of Asian American women of reproductive age in the U.S. were uninsured (Berchick et al., 2018), under 40% were using contraception regularly, and another 40% were having unprotected sex—the highest rate of unprotected sex compared to any other race/ethnicity (Choimorrow, 2018).

Chapter 3: Theoretical Approach

Each study in this dissertation integrates the Socio-Ecological Model (SEM) (McLeroy et al., 1988). For Aim 1, I first use the theories of Hyperdiversity and Spatialization as support for exploring ethnic neighborhood context of MENA and South Asian immigrant communities together (Zhou & DiRago, 2023). Then, I use various theories from the assimilation literature including the classical assimilation theory (MacDonald & MacDonald, 1964; Zhou, 1992), place stratification theory (C. Z. Charles, 2003), segmented assimilation theory (Portes & Zhou, 1993; Zhou, 1997), spatial assimilation theory (Massey & Denton, 1985; Orum, 2019; T. Wen, 2019), and the resurgent ethnicity perspective (Walton, 2012, 2015; T. Wen, 2019). In Aim 2, I use the construct of social context to explore the role of ethnic neighborhoods on health access as well as the theories from Aim 1 that were used to assess ethnic neighborhood context. Finally, Aim 3 used the Reproductive Justice (RJ) framework (*Reproductive Justice*, n.d.; L. J. Ross, 2017), theorized pathways for how structural racism among immigrants influences health (Philbin et al., 2018; Misra et al., 2021), and how racialized legal status contributes to racial/ethnic health disparities (Asad & Clair, 2018). In this chapter, I describe each of the theories and concepts.

Socio-Ecological Model (SEM)

SEM posits that "health behavior and promotion are interrelated" and occur through the interplay of individual, interpersonal, institutional, community, and policy factors (McLeroy et al., 1988). The integration of contextual factors (i.e., factors that span the community, institutional, and policy level) makes SEM unique from other theories of health behavior since it explicitly recognizes the role of the social environment on health (McLeroy et al., 1988; Sallis et al., 2015). Traditionally, SEM has been used to develop interventions that target specific health behaviors; however, it is also useful for identifying, understanding, and describing how factors

across multiple levels of the social environment influence health (Ajayi et al., 2021; Aura et al., 2016; Garney et al., 2021). Using SEM, this dissertation examined how contextual-level factors, including citizenship status and neighborhood context, contribute to health insurance status among MENA and South Asian Americans, and contraception use.

<u>Hyperdiversity and spatialization</u>

Hyperdiversity refers to the phenomenon through which intra- and inter-ethnic diversity intersect along a wider array of parameters, including lifestyles, attitudes, and practices (Tasan-Kok et al., 2014). That is, unlike the Black and White dichotomy that has been used to understand immigrant residential assimilation patterns, the concept of Hyperdiversity acknowledges that immigrants within one ethnic group may have identities that overlap with other racial and ethnic groups that do not necessarily fit within the Black-White dichotomy; and have heterogeneity among themselves (Kraftl et al., 2019; Miyares, 2004; Zhou & DiRago, 2023).

Spatialization refers to the formation of new axes of social difference by virtue of a shared residential context. That is, spatialization can occur between members of different ethno-racial identities if they are geographically interlaced or experience similar structural inequalities (Zhou & DiRago, 2023). For example, despite having different racial or ethnic identities, individuals may have shared lived experiences because of their migration trajectories or have similar experiences with discrimination in the receiving context. MENA and South Asian pan-ethnic immigrant groups are an example of groups who are hyperdiverse and experience spatialization. Each of these immigrant groups have diverse cultural, linguistic, religious, and ancestral backgrounds (Abuelezam et al., 2018; Khalil et al., 2020; South Asian Americans Leading Together (SAALT), 2019). But with respect to one another, MENA and South Asians

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are racially categorized differently – MENA often must self-report their race as White due to limited options for racial classification in most demographic data (Abboud et al., 2019), and in some cases, may also benefit from having a white-passing racial identity (Ford & Sharif, 2020). South Asians, on the other hand, are typically categorized as Asian or "AAPI", and are not typically considered "White-passing" (S. K. Ramakrishnan, 2023). Despite these differences in racial classification, MENA and South Asians may also share certain sociocultural values, religious institutions, migration trajectories including their motivations for migration and visa opportunities, and encounter Islamophobia in the host society. These similarities may encourage MENA and South Asian immigrants to resettle in overlapping geographic contexts despite having differences in their national origin and racial/ethnic backgrounds (Zhou & DiRago, 2023).

Ethnic neighborhoods: socioeconomic benefits and health

The neighborhood is an important context for ones lived experiences and health. Sociologists describe the neighborhood as a subdivision of urban or rural locations such as cities, villages, and towns that are defined by their physical and psychosocial characteristics (Berk, 2005). These physical and psychosocial characteristics are shaped by the people who live there, their location, existing systems of interaction and engagement, shared identities, and public symbols (Keller, 1968; Schwiran, 1983). These characteristics can shape individuals' access to 'material and infrastructural resources' (Macintyre et al., 2002), "opportunity structures", and opportunities for building social relationships (Macintyre et al., 2002; Kellekci & Berköz, 2006).

For immigrants, the *ethnic neighborhood* is an essential feature of one's social context. First, shared cultural background and socioeconomic status within a neighborhood can facilitate cooperation between neighbors, lead to higher levels of trust and cohesion, and foster solidarity

among residents (Iwamoto & Liu, 2010; Mossakowski & Zhang, 2014; Pettigrew et al., 2011). In addition to providing an spatial context for building social cohesion and community engagement, the ethnic neighborhood can help immigrants access multidimensional supports for finding jobs and affordable housing, and generate social capital (Nee & Sanders, 2001a, 2001b; Campbell & McLean, 2002).

Ethnic neighborhoods also play a crucial role in enabling health access and utilization since they offer immigrants a space to exchange information on beliefs and knowledge related to illness and health-seeking behavior and where to obtain culturally-competent and affordable social and health services (Doherty & Campbell, 1988; Doherty & McCubbin, 1985; Kawachi et al., 1996, 1997; Kawachi & Berkman, 2014; Leclere et al., 1994; C. E. Ross et al., 1990; Walton, 2012). Furthermore the ethnic neighborhood allows immigrants to avoid seeking care at health institutions outside of their community that may lack cultural awareness, language-specific resources, or harbor discriminatory attitudes (Clough et al., 2013; Gee & Ford, 2011). Therefore, in addition to building social capital, ethnic neighborhoods may help reduce immigrant exposure to discrimination (Feagin, 2018; Fisher et al., 2000; Portes & Zhou, 1993; Seaton et al., 2018), which could otherwise negatively influence their health outcomes.

Previously, ethnic neighborhoods have been explored with respect to other immigrant communities include the Cuban immigrant neighborhoods in in Miami, Mexican immigrant neighborhoods in Texas and California (Portes & Bach, 1985; Portes & Jensen, 1992), and Old Chinatowns (Zhou, 2009). These communities are described as ethnic enclaves in the assimilation literature, which are geographic areas with high ethnic concentration that uphold a strong cultural identity and have flourishing economic activity (Hummon, 1996). Another type of ethnic neighborhood that has been studied with respect to more recent waves of immigration

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from East Asia are *ethnoburbs* which are ethnic neighborhoods located in suburban areas that are also notable for their high levels of socioeconomic advantaged (Li, 1998; Trinh Vo & Yu Danico, 2004). In the next section, I describe theories that I used to hypothesize types of ethnic neighborhoods that may be formed among MENA and South Asian Americans.

Theorizing types of ethnic neighborhoods

Place stratification and classical assimilation theory. Place stratification theory posits that dominant members of the host society manipulate space to maintain their physical and social separation from groups who they view as undesirable (C. Z. Charles, 2003; Logan & Molotch, 2007). As result, racial and ethnic minorities have less opportunity to resettle in neighborhoods that are socioeconomically advantaged and have high quality socioeconomic resources and institutions (C. Z. Charles, 2003; Logan & Molotch, 2007). Rejection from members of the host society empowers immigrants to resettle in urban centers with members of their own co-ethnic community or kin, more commonly known as ethnic enclaves (Chimbos & Agocs, 1983; Portes & Jensen, 1989). Ethnic enclaves are neighborhoods that are built on solidarity for mutual assistance and cultural security (Takaki 1989), a process which has been described by the classical assimilation theory and the chain-migration process (MacDonald and MacDonald 1964, p.82; Zhou 1992). Here immigrants are able to build strong immigrant networks and social capital which they can use to gain access to tangible resources, such as information on employment opportunities, affordable housing, and government assistance programs (C. Z. Charles, 2003; Logan & Molotch, 2007). The pool of tangible and intangible resources that these ethnic neighborhoods generate for immigrants heighten their incentive to stay in these neighborhoods even though dominant members of the receiving society may consider these areas as undesirable places to live (Logan & Alba, 1993). Some scholars also suggest that there are too

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many barriers for immigrants to move into more advantaged neighborhoods, further disincentivizing immigrants from moving out of these ethnic neighborhoods (Logan & Alba, 1993).

    Segmented assimilation theory. Next, the segmented assimilation theory and place stratification theory were used to understand another type of inner-city ethnic neighborhood. According to the segmented assimilation theory, immigrants whose ethnic communities cannot provide leverage for social mobility will have children who will be unable to residentially integrate into predominantly White, upper-middle class neighborhoods, and will instead integrate into disadvantaged, racially-segregated neighborhoods with U.S.-born co-ethnics and other racialized minorities (Portes & Zhou, 1993; South et al., 2008). Whether these ethnic neighborhoods are formed in response to the discrimination and constraint predicted by place stratification, or by individual and group horizontal or downward mobility as predicted by segmented assimilation, the result is an economically disadvantaged and socially disorganized ethnic context dominated by a "poverty paradigm" (Morenoff & Lynch, 2004; Williams & Collins, 2016). These neighborhoods are often characterized by crime, gangs, dilapidated housing, and failing schools (Morenoff & Lynch, 2004; Williams & Collins, 2016). Prior literature describes such ethnic neighborhoods as communities of constraint and characterizes them as having a high concentration of U.S.-born individuals who are socioeconomically disadvantaged.

    Spatial assimilation theory. In addition to the inner-city ethnic enclaves, ethnic neighborhoods are appearing in suburban areas (Li, 1998a, 1998b). This change can be explained through the spatial assimilation theory which posits that as their social status rises, minorities attempt to improve their socioeconomic achievements through improved spatial positions in

primarily White, upper-middle class neighborhoods (Massey & Denton, 1985; Orum, 2019; T. Wen, 2019). Such neighborhoods are more commonly known as "*ethnoburbs*", which are suburban clusters in residential areas where one ethnic group has a significant concentration but does not necessarily comprise the majority (Li, 1998; Trinh Vo & Yu Danico, 2004). In establishing footholds in destinations that are distant from their traditional immigrant gateways, the geographic clustering of immigrants in suburban areas is a new demographic trend that has led to great levels of ethno-racial diversity in areas where it has historically been uncommon (Fischer & Tienda, 2006; Hall, 2013; Hall et al., 2016; Massey, 2008).

Resurgent ethnicity perspective. Finally, the resurgent ethnicity theory suggests that immigrants and U.S.-born ethnic minorities who already have high socioeconomic status have little to gain from spatial integration with Whites and much to gain from living among others of the same ethnicity (Logan et al., 2002; M. Wen et al., 2009). Therefore, instead of trying to move into integrated neighborhoods, immigrants with high socioeconomic status prefer to live in less integrated neighborhoods. Such neighborhoods offer immigrants access to high-quality education and access to institutional resources (Zhou, 2007), while preserving their cultural identity, norms, and behaviors (Aguilar-San Juan, 2009). These neighborhoods provide immigrants with professional opportunities, well connected social networks, and high social capital, while also decreasing their chances of assimilating with members of the dominant group (Zhou, 2007).

Reproductive justice (RJ) framework

The RJ perspective asserts the right of childbearing peoples, especially indigenous women and women of color, "to have a child, not to have a child, and to parent the children they have, and have control of their birthing options" (*Reproductive Justice*, n.d.). The RJ perspective underscores the ways in which social inequalities have shaped SRH and how our government

and public institutions are responsible for perpetuating these inequalities (L. J. Ross, 2017).

Indeed, immigration policies, which are often enforced through citizenship status, enforce

differential degrees of legal protection and surveillance, access to political, labor market, social

opportunities among immigrants (Bosniak, 2008) and poses a major systemic barrier for

immigrants access to SRH services, including contraception. The RJ framework was critical for

the framing of Aim 3 (Chapter 8) and assertion for the importance of assessing citizenship status

with respect to contraception use.

<u>Immigration-related policies, citizenship status, and health</u>

In Aim 3, SEM was used to understand how policy level factors such as citizenship status

influence reproductive health among immigrants. In this dissertation, I used Philbin et al.

(2018)'s theoretical model on how immigration-related policies influence Latinx health

disparities in the U.S. This theory builds on SEM, as it acknowledges how policy and

institutional factors can shape health access. Furthermore, Philbin et al. (2018)'s theory specifies

how structural level factors like policy interact with interpersonal experiences of discrimination,

access to material resources, and stress related to structural racism, to ultimately shape

immigrant health (See Figure 1).

First, Philbin et al. (2018)'s theoretical model on how immigration-related policies

influence Latinx health disparities in the U.S. suggests that exclusionary and immigration-related

policies are a form of structural racism that limit healthcare access and contribute to stress,

discrimination, and illness among racial/ethnic minorities (Gee & Ford, 2011; Viruell-Fuentes et

al., 2012). The theorized pathway describes four mechanisms through which immigration-related

policies influence health. First, immigration policies act as a form of structural racism because

they inhibit access to certain services or rights for belonging in the U.S., and generate and

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reinforce inequities in government, public, and healthcare institutions for certain subgroups of

the population (Gee & Ford, 2011). Next, immigration policies related to immigration

enforcement laws, healthcare eligibility criteria, and employment qualifications may contribute

to stress among immigrants (Philbin et al., 2018). Finally, these laws also reduce access to

beneficial social institutions, such as education and health institutions, and material resources

including basic needs such as food, income, adequate housing, and health resources and services,

all of which could adversely influence health (Philbin et al., 2018). These barriers may also

shape whether immigrants are willing to engage with the health system or providers to address

their reproductive health needs including contraception.

Figure 1. Theorized pathways through which immigration-related policies and policies relevant
to immigrants influence Latino health (Philbin et al., 2018)
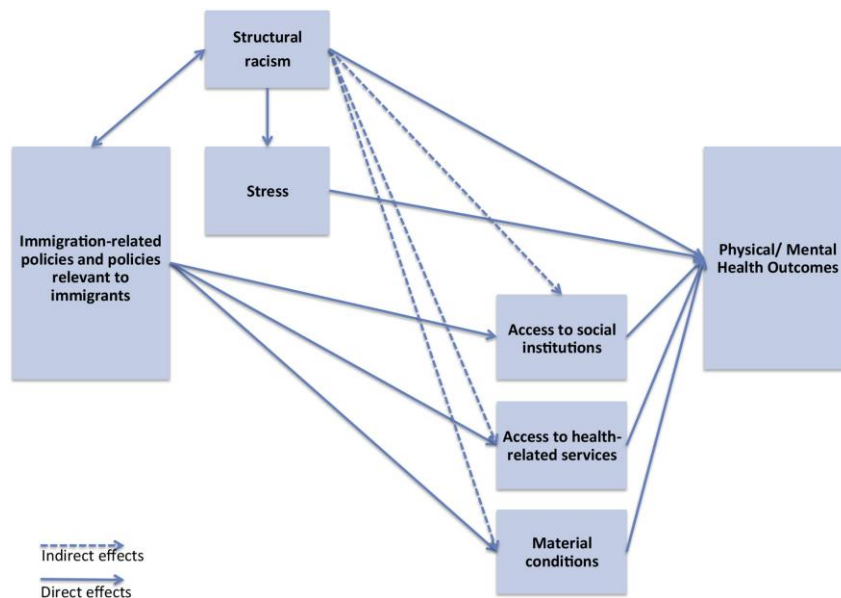
Misra et al. (2021) has also proposed that structural racism affects immigrant health not

only through immigration policies, but also through *citizenship status* since these legal

classifications shape the ability an immigrant has to access material health resources and be

civically and politically engaged in the U.S. (Figure 2). In Aim 3, I synthesized Misra et al.

(2021)'s model with Philbin et al.'s (2018) theorized pathway to develop a conceptual model that

indicated mechanisms through which citizenship status influenced contraception use among

immigrant women.

Figure 2. Proposed pathways showing the role of structural racism on immigrant health
(Misra et al., 2021)
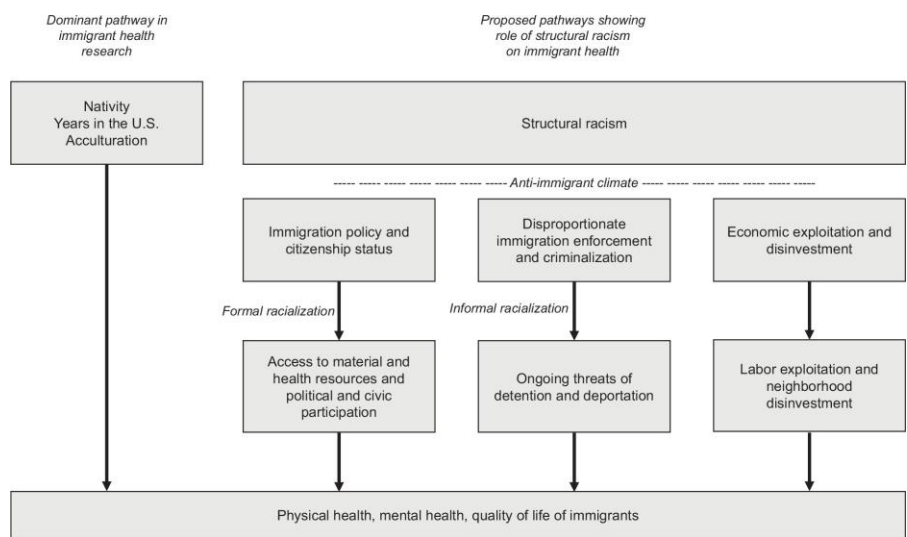
Racialized legal status

Asad and Clair's (2018) model of the role of *racialized legal status* on racial/ethnic

health disparities explained why citizenship status may shape contraception use among

immigrants of different race/ethnicity identity, differently (See Figure 3). Asad and Clair (2018)

posited that though policies related to immigration appear "race-neutral" since they do not

explicitly target specific racial/ethnic groups (Asad & Clair, 2018), the political rhetoric and

media messaging around immigration creates a hostile environment for anyone who is perceived

to be an immigrant because of their skin color, language, or any other characteristic that could be

used to conflate ethnicity and legal status (Gee & Ford, 2011; Viruell-Fuentes et al., 2012). As a

result, marginalized racial minorities, such as Black and Latinx are often disproportionately

affected by immigration policies and practices like surveillance, detention, and deportation (Asad

& Clair, 2018; Pager & Shepherd, 2008; Rosenblum & McCabe, 2014). This directly contributes

to increased stress and fear among racialized minorities and adversely affects their health (Asad

& Clair, 2018).

Figure 3. Conceptual model linking racialized legal status to racial/ethnic health disparities
(Asad & Clair, 2018).
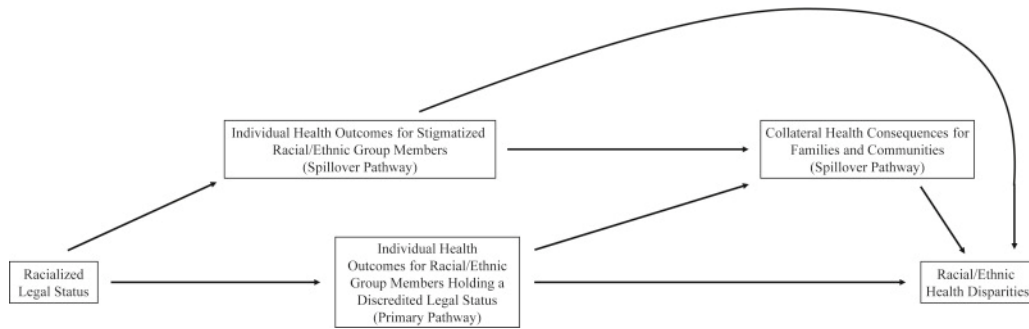
Summary

      Each study within this dissertation integrates SEM (McLeroy et al., 1988). With its focus

on ethnic neighborhoods and health, Aims 1 and 2, also integrated the concepts of

Hyperdiversity and Spatialization (Zhou & DiRago, 2023), the classical assimilation theory

(MacDonald & MacDonald, 1964; Zhou, 1992), place stratification theory (C. Z. Charles, 2003),

segmented assimilation theory (Portes & Zhou, 1993; Zhou, 1997), spatial assimilation theory

(Massey & Denton, 1985; Orum, 2019; T. Wen, 2019), and the resurgent ethnicity perspective

(Walton, 2012, 2015; T. Wen, 2019). Finally, Aim 3 used the RJ framework (*Reproductive

Justice*, n.d.; L. J. Ross, 2017), theorized pathways for how structural racism among immigrants

influence health (Philbin et al., 2018; Misra et al., 2021), and how racialized legal status

contributes to racial/ethnic health disparities (Asad & Clair, 2018). Figure 4 depicts an integrated

conceptual model of the frameworks and theories used in this dissertation to hypothesize how

factors like the ethnic neighborhood and citizenship shape health access and SRH among

MENA, South Asians, and the general immigrant populations.

Figure 4. Integrated conceptual model of factors that affect immigrant health access and sexual and reproductive health (SRH) in MENA, South Asian, or general immigrant populations.

Sociodemographic characteristics
• Age
• Race/ethnicity
• National origin
• Relationship status
• Religious affiliation
• Citizenship status
• Socioeconomic status

Structural racism
• Immigration policies or policies related to immigration:
• Immigration enforcement policies
• Eligibility/restrictions on for healthcare services or public benefits
• Employment opportunities
• Neighborhood disinvestment

Neighborhood context
• Geographic dimensions (urban/suburban/rural, city)
• Social dimensions (ethnic vs. non-ethnic, high foreign born)
• Socioeconomic dimensions (median household income, home ownership, educational attainment, etc.)

Individual factors
• *Acculturation
• *Pregnancy plans,
• Parity
• Fertility norm,
• Female empowerment
• Knowledge about family planning
• Reproductive autonomy

• Stress/lived experiences
• Access to social institutions
• Access to health-related services
• Material resources (e.g., economic and social capital)

Sexual and reproductive health outcomes (e.g., contraception use)

- - - ▶ Relationship is not being tested

Chapter 4: Aims and Hypotheses

Aim 1. Develop a typology that organizes MENA and South Asian ethnic neighborhoods in California according to social and economic dimensions (co-ethnic density, foreign-born density, and socioeconomic status) of the neighborhood.

Sub-aim 1: Describe sociodemographic characteristics of MENA and South Asian Americans in California.

Sub-aim 2: Determine if MENA and South Asian American co-ethnic neighborhoods are in similar areas geographically.

Sub-aim 3: Describe social and economic dimensions of neighborhoods by their MENA and South Asian co-ethnic density.

Sub-aim 4: Develop an ethnic neighborhood typology for MENA and South Asian Americans based on social and economic dimensions of their neighborhoods.

Sub-aim 5: Assess if the ethnic neighborhood typology is associated with differences in sociodemographic characteristics of the MENA and South Asian Americans (aged 18 years and older) in California.

Hypotheses (only for Sub-aim 2, 4, and 5)

1. I hypothesized that MENA and South Asian immigrants resettle in similar geographic contexts. MENA and South Asian immigrants are two hyperdiverse pan-ethnic communities that also experience spatialization with respect to each other. First, internally, MENA and South Asians are two pan-ethnic immigrant communities that have diverse cultural, linguistic, religious, and ancestral backgrounds (Abuelezam et al., 2018; Khalil et al., 2020; South Asian Americans Leading Together (SAALT), 2019)). Then, with respect to one another, MENA and South Asians may be racially categorized differently – MENA often self-report their race as

White (Abboud et al., 2019), and in some cases may also benefit from having a white-passing racial identity (Ford & Sharif, 2020), while South Asians are often racially categorized as Asian or "AAPI", or "Other" (S. K. Ramakrishnan, 2023). Despite their ethnic differences and distinct racial classification, MENA and South Asians have some common motivations for migration (conflict and war, refugee resettlement, and visa opportunities for employment and education), and encounter Islamophobia in the host society. Similarly, I expect that these two pan-ethnic groups have overlapping geographic resettlement contexts.

2. Based on their shared migration pathways, and the classical assimilation, place stratification, segmented assimilation, spatial assimilation, and resurgent ethnicity theories, I expected MENA and South Asians Americas would form similar types of neighborhood contexts including:

a. Neighborhoods with high co-ethnic density, high immigrant concentration, and socioeconomic disadvantage which are comparable to ethnic enclaves (Portes & Bach, 1985; Portes & Jensen, 1992; Zhou, 2009).

b. Neighborhoods with high co-ethnic density, high integration with U.S.-born racial minorities, and socioeconomic disadvantaged like the communities of constraint described by the segmented assimilation theory (Portes & Zhou, 1993; Zhou, 1997).

c. Neighborhoods with high co-ethnic density, high integration with the dominant members of the host society, and socioeconomic advantage which are in line with the spatial assimilation theory (Massey & Denton, 1985; Orum, 2019; T. Wen, 2019).

d. Neighborhoods with high co-ethnic density, high immigrant presence and socioeconomic advantage, in line with the ethnic neighborhoods described through the resurgent ethnicity perspective (Walton, 2012, 2015; T. Wen, 2019).

3. I expected that there would be significant sociodemographic differences in within the MENA and South Asian population in California by the type of ethnic neighborhood in which they lived. Specifically, I expected to observe the following trends within each neighborhood context compared to MENA and South Asians who did not live in a co-ethnic neighborhood.

   a. MENA and South Asian Americans in neighborhoods with high co-ethnic density, high immigrant concentration, and socioeconomic disadvantage were expected to have a higher prevalence of non-citizens, large household size, linguistic isolation, and having any health insurance. MENA and South Asians in these neighborhoods were expected to have lower prevalence of English speaking proficiency, living in the U.S. for over 15 years, high educational attainment and household income, and private health insurance.

   b. MENA and South Asians living in neighborhoods with high co-ethnic density, low immigrant density and socioeconomic disadvantaged were expected to have higher prevalence of citizens, large household size, English speaking proficiency, living in the U.S. for over 15 years. MENA and South Asians in these neighborhoods were also expected to have lower prevalence for linguistic isolation, high educational attainment and household income, having any health insurance, and having private health insurance.

   c. MENA and South Asian Americans living in neighborhoods with high co-ethnic density, high immigrant density and socioeconomic advantage are expected to have higher prevalence for English speaking proficiency, large household size, high educational attainment and household income, having any health insurance, and having private health insurance. MENA and South Asians in these neighborhoods were also expected to have lower prevalence of citizens, linguistic isolation, and living in the U.S. for over 15 years.

d. MENA and South Asians living in neighborhoods with high co-ethnic density, high

   integration with the dominant members of the host society, and socioeconomically

   advantaged were expected to have to have higher prevalence of citizens, English

   speaking proficiency, living in the U.S. for over 15 years, high educational attainment

   and household income, having any health insurance, and having private health insurance.

   MENA and South Asians in these neighborhoods were also expected to have lower

   prevalence for linguistic isolation and large household size.

Aim 2. Examine the role of neighborhood context on health insurance status (any insurance and
private health insurance vs. public health insurance) among MENA and South Asian Americans
aged 18 and older in California.

   Sub-aim 1: Examine if MENA or South Asians race/ethnicity is associated with health

   insurance status (includes any insurance and private health insurance vs. public health

   insurance) among those aged 18 and older in California.

   Sub-aim 2: Examine if the neighborhood context is associated with health insurance status

   (any insurance and private health insurance vs. public health insurance) among MENA and

   South Asian Americans aged 18 and older in California.

   Sub-aim 3: Examine if the neighborhood context is a better predictor of health insurance

   status (any insurance and private health insurance vs. public health insurance) among MENA

   and South Asian Americans aged 18 and older in California compared to individual-level

   characteristics alone.

   Sub-aim 4: Assess if examining neighborhood context as a typology is a better predictor of

   health insurance status (any insurance and private health insurance vs. public health

insurance) for MENA and South Asian Americans aged 18 and older in California compared to examining each socioeconomic indicator of the neighborhood independently.

Hypotheses

1. I hypothesized that individuals who report MENA or South Asian race/ethnicity will have significantly greater odds of 1) having any health insurance and 2) having private health insurance (vs. public health insurance) compared to Non-Latinx (NL) and non-MENA or South Asian White Americans. MENA and South Asians are a predominantly socioeconomically advantaged and have educational attainment and household incomes that are higher than the general U.S. population. To illustrate this, in 2021, the average MENA household income in the U.S. was $115,000 (Forrester, 2023) and the median household income of Indian Americans—the largest South Asian American subgroup—was $138,000, annually (USA Facts, 2023), compared to $102,000 among White Americans. MENA and South Asians immigrants are also well integrated into high-paying and highly-skilled professions (Alarcon, 1999). The socioeconomic and professional backgrounds of most MENA and South Asian immigrants suggest that they may overall have higher odds of having health insurance and private health insurance compared to White Americans.

2. MENA and South Asian Americans are two hyperdiverse pan-ethnic communities that may form different types of ethnic neighborhoods when the resettle in the U.S. Due to their difference in socioeconomic advantage and community resources and supports (Nee & Sanders, 2001a, 2001b; Campbell & McLean, 2002), I expected that the type of ethnic neighborhood in which one lived would be associated with health insurance status among MENA and South Asian Americans.

3. I hypothesized that examining the neighborhood context would be an important significant addition to assessing whether one had health insurance or private health insurance (vs. public health insurance) among MENA and South Asian Americans compared to only using individual level covariates to assess health insurance status within these population. This is because population-level data on MENA and South Asian Americans often obscure inequities in health access within these immigrant communities. This is because most MENA and South Asians in these studies are from race/ethnic subgroups that, on average, experience socioeconomic advantage (Alarcon, 1999; Forrester, 2023; USA Facts, 2023). Assessing their neighborhood context would enable researchers to understand which MENA and South Asian communities experience the greatest disadvantage in terms of health insurance status. Furthermore, not basing differences on racial or ethnic lines, allows researchers to avoid blaming health inequities in these immigrant communities on a specific culture or ethnic practice. Instead, the ethnic neighborhood typology offers a holistic consideration of the historical context from which immigrants are coming, the context of their reception in the host society, and the opportunities and material resources they may be privy to within their specific resettlement context.

4. I hypothesized that the theoretically-driven ethnic neighborhood typology that was developed based on the social and economic dimensions of the neighborhood would be a better way of assessing the association between neighborhood context on health insurance status instead of assessing neighborhood context using individual neighborhood-level factors such as co-ethnic density, foreign-born density, and socioeconomic status on their own. There is a substantial body of research that explores specific aspects of the neighborhood context with health outcomes (Kandula et al., 2009; Mason et al., 2011; Walton, 2015). Studies also indicate

that the reason for living in racial and ethnic residential concentration, in the first place, are mixed. On one end, ethnic neighborhoods can result from institutional and interpersonal discrimination that constrains individual choices (Massey and Denton 1993). On the other hand, residence in ethnic neighborhoods can result from individual preferences for living in a neighborhood that is comfortable and familiar (Charles, 2003). Furthermore, diversity in national origin, socioeconomic status and nativity within MENA and South Asian American pan-ethnic communities suggest that there are limitations to the strength and directions of associations observed in studies that use one indicator of ethnic concentration to examine health access and outcomes. Examining the ethnic neighborhood using a typology allowed me to consider ways that ethnic neighborhoods may be distinct even within the same immigrant community. I applied multiple theories of immigrant assimilation to account for different social and economic patterns of each neighborhood. This may improve the way researchers explore health inequities within MENA and South Asian pan-ethnic communities.

Aim 3. Examine if citizenship status is associated with the use of a reversible method of contraception in the past 12 months among cis-gender, heterosexual women between the ages of 18-44 years in California who were at risk of becoming pregnant (i.e., sexually active with at least one male sexual partner in the past 12 months, could become pregnant, and did not plan to become pregnant in the next 12 months).

Sub-aim 1: Examine if nativity is associated with use of a reversible method of contraception in the past 12 months among cis-gender, heterosexual women between the ages of 18-44 years in California who were at risk of becoming pregnant.

Sub-aim 2: Assess if citizenship status is associated with use of a reversible method of contraception in the past 12 months among foreign-born cis-gender, heterosexual women between the ages of 18-44 years in California who were at risk of becoming pregnant.

Sub-aim 3: Assess if health insurance status mediated the association between citizenship status and use of a reversible method of contraception in the past 12 months among foreign-born cis-gender, heterosexual Asian and Latinx women between the ages of 18-44 years in California who were at risk of becoming pregnant.

Sub-aim 4: Assess if race moderated the association between citizenship status and use of a reversible method of contraception in the past 12 months among Asian and Latinx foreign-born cis-gender, heterosexual women between the ages of 18-44 years in California who were at risk of becoming pregnant.

Sub-aim 5: Assess if there were bivariate differences in type of contraception method used in the past 12 months by citizenship status among cis-gender, heterosexual women between the ages of 18-44 years in California who were at risk of becoming pregnant.

Hypotheses

1. I hypothesized that foreign-born cis-gender, heterosexual women between the ages of 18-44 years in California who at risk of becoming pregnant would have lower odds of using a reversible method of contraception in the past 12 months compared to their U.S.-born counterparts.

2. I hypothesized that citizenship status would be positively associated with use of a reversible method of contraception in the past 12 months among foreign-born cis-gender, heterosexual women between the ages of 18-44 years in California who at risk of becoming pregnant. That is, among foreign-born cis-gender, heterosexual women between the ages of 18-

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44 years in California who were at risk of becoming pregnant, legal permanent residents (LPRs) and non-citizens without a green-card would have lower odds of using a reversible method of contraception in the past 12 months compared to naturalized citizens.

3. I hypothesized that health insurance status would mediate the association between citizenship status and use of a reversible method of contraception in the past 12 months among foreign-born cis-gender, heterosexual Asian and Latinx women between the ages of 18-44 years in California who were who at risk of becoming pregnant. That is, in addition to the association between citizenship status and contraception use, there would be an observable association between citizenship status and health insurance status and health insurance status and use of a reversible method of contraception in the past 12 months among foreign-born cis-gender, heterosexual women between the ages of 18-44 years in California who were who at risk of becoming pregnant.

4. I hypothesized that among foreign-born cis-gender, heterosexual women between the ages of 18-44 years in California, the association between citizenship status and use of a reversible method of contraception in the past 12 months would be different for Asian and Latinx. This may be related to differences the migration histories and disparities in encounters with immigrant enforcement practices among these racial/ethnic groups (Asad & Clair, 2018; Pager & Shepherd, 2008; Rosenblum & McCabe, 2014).

5. I hypothesized that there would be significant bivariate difference in the type of contraception method used in the past 12 months by citizenship status among cis-gender, heterosexual women between the ages of 18-44 years in California who were who at risk of becoming pregnant. U.S.-born citizens and naturalized citizens were expected to have higher levels of use of long-acting reversible methods of contraception (e.g. IUD and implant) and short

acting hormonal methods (e.g. pills) since they may have better access to contraception through the formal health sector. Non-citizens without a green-card were expected to have the highest levels of non-use or condom use since they are the most affordable and accessible form of contraception (Planned Parenthood, 2015).

Chapter 5: Study Design and Methods

Study context

California is home to the largest population of immigrants in the country (27% vs. 14% for U.S. overall) (Perez, Mejia, et al., 2021) and some of the largest populations of Middle Eastern and North Africans (MENA)[7] (2 million) and South Asians[8] (5.4 million) (Harjanto & Batalova, 2022; SAALT, 2019). The Center for Migration Studies also indicates 78% of immigrants within California are either naturalized citizens or with legal documentation (including green cards and visas), while 22% are undocumented (Perez, Mejia, et al., 2021). In 2019, lawmakers in California also claimed that affordability of healthcare, including sexual and reproductive healthcare, was a bipartisan priority (Hamel et al., 2019). Based on characteristics of the immigrant population and their health priorities, the studies within this dissertation were set in California.

The American Community Survey (ACS) and the California Health Interview Survey (CHIS) served as appropriate datasets for this study since they allowed for the evaluation of factors that influenced health access and sexual and reproductive health within immigrant

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7 MENA countries: Bahrain, Iraq, Iran, Israel, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, Syria, the United Arab Emirates, Yemen; North Africa: Algeria, Egypt, Libya, Mauritania, Morocco, Somalia, Sudan, Tunisia.
8 South Asian countries: Afghanistan, Bangladesh, Bhutan, India, Myanmar (Burma), Nepal, Pakistan, Sri Lanka (Ceylon)

populations. For example, because ACS included measures of personal and parents' country of origin and healthcare insurance status, ACS was an appropriate data source to examine health access for MENA and South Asian Americans. Additionally, CHIS is the only health-related data source that is known to report on citizenship status and sexual and reproductive health outcomes including contraception use in the past 12 months (Tapales et al., 2019). In this chapter, I will briefly describe these two data sources, the samples of each study, and their primary measures and analytical techniques.

<u>Study design for Aims 1 and 2</u>

Data. Aim 1 and Aim 2 used the 2020 ACS, which is a nationwide survey that collects annual data on social, economic, housing, and demographic characteristics of the U.S. population (ACS, 2023). Each year, 3.5 million households and group quarters[9] are contacted to participate in the ACS from Census Bureau's official inventory of known living quarters and nonresidential units in the U.S. (Poehler, 2022a). For Aim 1 and Aim 2, I used the 5-Year Estimates version of the 2020 ACS as it provides a larger sample which allows for smaller margins of error and increased statistical reliability for smaller geographic areas and population groups compared to the 1-Year Estimates (U.S. Census Bureau, 2020). Aim 1 also included a descriptive analysis that used ACS geospatial boundary data. In Chapter 6 and Chapter 7 I provide further detail on the data collection methods and response rates for the 2020 ACS 5-Year Estimates data.

Sample. In Aim 1 the person-level sample includes all individuals who were living in California at the time of the survey (N=1,816,306) and the neighborhood-level sample includes the public use microdata area (PUMA) (N_{PUMA}=265) (PUMAs are described in further detail in

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9 Group quarters are where people stay in group living arrangements that are owned or managed by an organization providing housing and/or services for the residents (e.g., college residence halls, skilled nursing facilities, group homes, correctional facilities) (Chapter 8, ACS Design & Methodology, 2014).

the measures section of this chapter). Aim 2 include an initial sample of individuals over the age of 18 years who were living in California ($N_{Total\ 18+}$: 1,444,781) and a sub-sample of MENA and South Asian adults aged 18 years and older who were living in California at the time of the survey (N_{MENA}=22,165; $N_{South\ Asian}$= 30,563). The screening process for Aim 1 and Aim 2 are described in Figure 1.

Figure 1. Screening of final analytic sample for Aim 1 and Aim 2
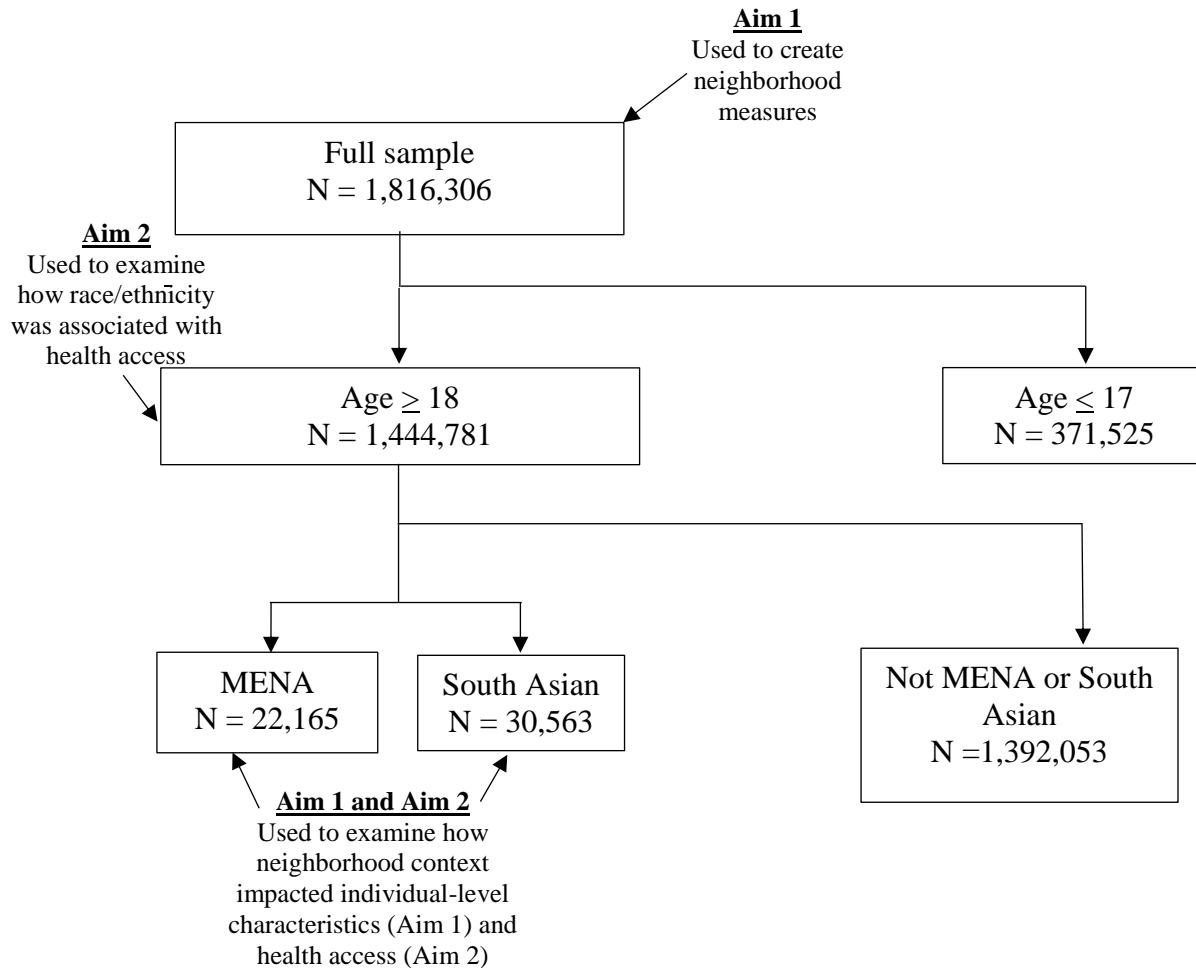
Measures. The main constructs that were measured in Aim 1 included neighborhood context (assessed in terms of their geographic, social, and economic dimensions). Aim 2 focused on the same measures but examined their association with health insurance status (any health insurance and private vs. public health insurance). In Aim 1 and Aim 2, I defined the

neighborhood as a public use microdata area (PUMA) since it was the smallest statistical geographic area unit available through the ACS public use microdata. Geographic dimensions of the neighborhood were examined based on their county classification as urban, suburban, rural, and location in a central city. Social dimensions of the neighborhood that were examined included co-ethnic density (i.e. percent of members of the same ethnic group within a neighborhood), foreign-born density (i.e. percent foreign-born within a neighborhood) and socioeconomic status (i.e. an index of socioeconomic status based on measures of educational attainment, median household income, and home ownership within a neighborhood). These measures were used to create an ethnic neighborhood typology informed by the theories described in Chapter 3. More details on how the measures were created for Aim 1 are described in Chapter 6.

Aim 2 introduced the health outcome of interest which was health access. Health access was operationalized by using the measure of health insurance status through two separate binary outcomes including 1) whether an individual had *any* health insurance and 2) whether an individual who had health insurance had private health insurance (1) or public health insurance (0). The ACS provided a detailed measure on types of health insurance which is described in detail in Chapter 7. Type of health insurance was defined categorized based on definitions from the U.S. Census Bureau (Turner et al., 2009). A complete description of how the measures were created for Aims 1 and 2 are provided in Chapters 6 and 7.

Analysis. Aim 1 was primarily a descriptive analysis, starting with a description of the geographic, sociodemographic, migration, and health access characteristics of MENA and South Asians aged 18 years and older in California. I also created a map to geographically represent where MENA and South Asians ethnic neighborhoods existed in California (Chapter 6, Figure

2). Finally, I described geographic, social, and economic characteristics of MENA and South

Asian co-ethnic neighborhoods by their co-ethnic density (Chapter 6, Tables 3 and 4) and

developed an ethnic neighborhood typology based on these measures (Chapter 6, Figure 3).

Finally, Pearson chi-square tests were used to examine bivariate associations between

neighborhood context (based on their typology classification) and the sociodemographic,

migration, and health access characteristics of MENA and South Asians in the sample (Chapter

6, Table 5 and 6).

Aim 2 included descriptive analysis of the sociodemographic characteristics of the adult

(18+) MENA and South Asian population in California (Chapter 7, Table 1) and bivariate and

multivariate analysis of how MENA race/ethnicity, social and economic dimensions of the

neighborhood, and the ethnic neighborhood typology were associated with health insurance

status. First, Pearson chi-square tests were used to assess bivariate associations between

geographic, social, and socioeconomic dimensions of the neighborhood, and ethnic

neighborhood type with health insurance status (having any health insurance and having private

health insurance instead of public health insurance) (Chapter 7, Table 2). Then binomial logistic

regressions were used to assess how MENA and South Asian race/ethnicity was associated with

health insurance status (Chapter 7, Table 3, Models 1 and 2). Finally, binomial logistic

regressions were used to examine how social and economic dimensions of the neighborhood and

the ethnic neighborhood typology were associated with health insurance status (having any

health insurance and having private health insurance instead of public health insurance), net of

individual-level factors (Chapter 7, Tables 4 and 5). Wald Tests were used to examine if

multivariate models that examined health insurance status were improved with the addition of

neighborhood-level characteristics to the baseline model that only accounted for individual level

characteristics of the sample. Wald Tests were also used to assess if the neighborhood typology was a better way for assessing the association between neighborhood context and health insurance status compared to when each geographic, social, and economic dimension of the neighborhood was added to the multivariate models independently.

Study design for Aim 3

Data. Aim 3 used the 2017-2020 waves of the adult (18 years and older) CHIS. CHIS was used as the data source because it is a multi-wave population-representative survey of health and healthcare needs in California (UCLA Center for Health Policy Research, n.d.) that includes unique and rich measure related to migration including citizenship/immigration status. Details on sampling methods, data collection, and response rates are described in detail in Chapter 8. The original CHIS was approved under UCLA Human Subjects Protection Committee (IRB) under IRB#11-002227 (*CHIS Frequently Asked Questions (FAQs)*, n.d.). Use of secondary data was considered exempt by the UCLA IRB.

Sample. The analytic sample included cis-gender, heterosexual sexually active women between the ages of 18-44 in California who were at risk of becoming pregnant (i.e. could become pregnant and did not plan to become pregnant in the next 12 months; N=5,804). Permanent method users (N=1,361) were excluded from the analysis as they were not considered to be at risk of becoming pregnant and the date of their procedure was not reported. The screening criteria used to finalize the analytic sample for Aim 3 is described in Figure 2.

Figure 2. Screening of final analytic sample for Aim 3

```
┌─────────────────────────┐        ┌─────────────────────────┐
│  Adult sample 2017-2020 │───────▶│          Male           │
│      N = 86,439         │        │      N = 38,431         │
└─────────────────────────┘        └─────────────────────────┘
             │
             ▼
┌─────────────────────────┐        ┌─────────────────────────┐
│         Female          │───────▶│ Sex assigned at birth: Male │
│       N = 48,008        │        │        N = 89           │
└─────────────────────────┘        └─────────────────────────┘
             │
             ▼
┌─────────────────────────┐        ┌─────────────────────────┐
│ Sex assigned at birth:  │───────▶│     ≥ 45 years old      │
│        Female           │        │      N = 34.990         │
│      N = 47,919         │        └─────────────────────────┘
└─────────────────────────┘
             │
             ▼
┌─────────────────────────┐        ┌─────────────────────────────┐
│    18-44 years old      │───────▶│ Sexual orientation: Not heterosexual │
│      N = 12,929         │        │         N= 1,543            │
└─────────────────────────┘        └─────────────────────────────┘
             │
             ▼
┌─────────────────────────┐        ┌─────────────────────────┐
│ Sexual orientation:     │───────▶│   Currently pregnant    │
│    Heterosexual         │        │       N = 374           │
│      N = 11,357         │        └─────────────────────────┘
└─────────────────────────┘
             │
             ▼
┌─────────────────────────┐        ┌─────────────────────────┐
│ Not currently pregnant  │───────▶│ Plans to become pregnant │
│      N = 10,983         │        │       N = 991           │
└─────────────────────────┘        └─────────────────────────┘
             │
             ▼
┌─────────────────────────┐        ┌─────────────────────────────┐
│ No plans to become      │───────▶│ No sex partner(s) in the last 12 months │
│     pregnant            │        │        N = 2,041            │
│      N = 9,992          │        └─────────────────────────────┘
└─────────────────────────┘
             │
             ▼
┌─────────────────────────┐        ┌─────────────────────────────┐
│    > 1 sex partner      │───────▶│ No male sexual partner in the past 12 │
│      N = 7,951          │        │         months              │
└─────────────────────────┘        │        N = 211              │
             │                      └─────────────────────────────┘
             ▼
┌─────────────────────────┐        ┌─────────────────────────┐
│ Male sexual partner in  │───────▶│ Unable to become pregnant │
│   the past 12 months    │        │       N = 575           │
│      N = 7,740          │        └─────────────────────────┘
└─────────────────────────┘
             │
             ▼
┌─────────────────────────┐        ┌─────────────────────────────┐
│ At risk of becoming     │───────▶│ Used a permanent method of  │
│    pregnant             │        │ contraception in the past 12 months │
│      N = 7,165          │        │        N = 1,361            │
└─────────────────────────┘        └─────────────────────────────┘
             │
             ▼
┏━━━━━━━━━━━━━━━━━━━━━━━━━┓
┃      Final sample       ┃
┃       N = 5,804         ┃
┗━━━━━━━━━━━━━━━━━━━━━━━━━┛
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Measures. The main outcome in this study was contraception use which was defined as the use of any modern[10] reversible method of contraception in the past 12 months. As part of a secondary analysis, I also measured the type of contraception used by the duration of their effectiveness (i.e. permanent method (tubal ligation, hysterectomy or male partner with a vasectomy, long-acting reversible methods (e.g., IUD or implant), pill or other hormonal, condom, or other non-hormonal). Details on how these measures were created are provided in Chapter 8.

Migration related constructs that I examined in relation to contraception use included nativity (U.S.-born vs. foreign-born) and citizenship status (among foreign born, included naturalized citizen, legal permanent residents (LPRs), and non-citizen). I also examined race as a potential moderator of the association between citizenship status and contraception use among foreign-born (self-reported races were recoded into five categories including Non-Latina (NL) White (reference), Latina[11], NL Asian (included Pacific Islanders), NL Black, and NL Other[12]). I also examined if type of health insurance had mediating effects on the associations between nativity and contraception use or citizenship status and contraception use. The study also controlled for several sociodemographic characteristics including age, relationship status, household size, educational attainment, annual household income before taxes, acculturation, and year of the survey. More information on how these measures were created are described in Chapter 8.

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10 Modern contraceptive method use is defined using Hubacher and Trussell's (2015) definition, which is "a product or medical procedure that interferes with reproduction from acts of sexual intercourse". This includes the following methods: intrauterine devices and systems (IUD), subdermal implants, oral contraceptives (pill), condoms (male and female), injectables, emergency contraceptive pills, patches, diaphragms and cervical caps, and spermicidal agents (gels, foams, creams, suppositories, etc.), vaginal ring, and sponge.
11 This category also included those who identified as "Hispanic" or "Latino"
12 Included "American Indian and "Alaska Native", "Native Hawaiian", or individuals who identified as more than one non-Latino race.

Analysis. First, I described the sociodemographic characteristics of the sample (Chapter

8, Table 1). Then, I conducted Pearson chi-square tests to assess if there were significant

differences in the sociodemographic, migration, and health characteristics of the sample by

citizenship status and race (Chapter 8, Tables 2 and 3). I also used Pearson chi-square tests to

examine if contraception use was associated with any sociodemographic, migration, or health

characteristics (Chapter 8, Table 4). Next, I conducted multivariate binomial logistic regressions

of nativity, race/ethnicity, and health insurance status on contraception use in the past 12 months

(Chapter 8, Table 5; Models 1-3). Then, among foreign-born, I estimated multivariate binomial

logistic regression models of citizenship status, race/ethnicity, and health insurance status on

contraception use in the past 12 months (Chapter 8, Table 6, Models 1-3). Then I conducted a

stratified analysis that examined the association of citizenship status on contraception use for

Latinx and Asian immigrants separately (Chapter 8, Table 7; Models 6-8). Then, I used Pearson

chi-square test to assess if there were significant bivariate differences in type of contraception

method used in the past 12 months (includes reversible and permanent method users) by

citizenship status (included U.S.-born citizens) (Chapter 8, Figure 3). A sensitivity analysis was

conducted to assess if there were differences between the analytic sample (contraception non-

users and reversible method users) and the permanent method users who were excluded from the

analysis.

Table 1. Overview of Methods

Paper/Aim	1	2	3
Study type	Quantitative	Quantitative	Quantitative
Data type	Secondary data Cross-sectional	Secondary data Cross-sectional	Secondary data Cross-sectional
Data source	ACS 2020 5-year estimates	ACS 2020 5-year estimates	CHIS 2017-2020
Setting	California	California	California
Sample	• Living in California • Born in the Middle East, North Africa, or South Asia or US born with at least parent who was born in the Middle East, North Africa, or South Asia.[7,8]	• Living in California • Born in the Middle East, North Africa, or South Asia or US born with at least parent who was born in the Middle East, North Africa, or South Asia[7,8] • 18 years or older	• Cis-gender heterosexual women ages 18-44 years who were sexually active, not pregnant and not planning to become pregnant in the next year who completed a CHIS interview in 2017, 2018, 2019 or 2020.
Sample	N=1,816,306	$N_{Total\ 18+}$: 1,444,781 N_{MENA}=22,165 $N_{South\ Asian}$= 30,563	N=5,804
Analysis	Descriptive	Descriptive, bivariate and multivariate binomial logistic regression; Wald Test model fit	Descriptive, bivariate and multivariate binomial logistic regression

Chapter 6: Making Sense of Middle Eastern North African And South Asian Ethnic
Neighborhoods in California

Aim 1

Introduction

When immigrants embark on their new lives within the host society, they are met with a myriad of social, cultural, or financial challenges. Co-ethnic neighborhoods, which are geographic regions with large concentration of people from the same ethnic or national origin, can ameliorate some of these challenges since they provide immigrants with social and professional networks and economic opportunities that can help them establish themselves in the receiving society (Logan et al., 2002). Two pan-ethnic immigrant groups that have grown since the 1965 Immigration and Nationality Act (i.e. repealed national-origin immigration quotas which were established in 1924), are Middle Eastern North Africans(MENA) and South Asians (Bhandari, 2022; Harjanto & Batalova, 2022). MENA and South Asians make up approximately 5% of the U.S. population (Arab American Institute Foundation, 2018; US Census Bureau, 2017; South Asian Americans Leading Together (SAALT), 2019) and they have also established prominent ethnic networks across North America in the past few decades. Still, MENA and South Asians are two perplexing pan-ethnic immigrant communities; although these groups are vastly diverse, they share similar migration trajectories, at times cultural and religious values and community centers, are affected by similar stereotypes and prejudices, including the "model minority" myth and Islamophobia, and even some resettlement contexts. No studies have examined how the shared experiences between these groups may contribute to their resettlement patterns, or even heterogeneity within MENA and South Asian resettlement contexts. Through this chapter, I examined the geographic, social, and economic characteristics of neighborhoods with high MENA and South Asian co-ethnic density (defined as the proportion of individuals of

the same ethnic origin who lived within a neighborhood neighborhoods) and assessed if these MENA and South Asian resettlement contexts could be organized into a theoretically informed ethnic neighborhood typology.

Background

<u>Who are MENA and South Asian Americans?</u>

Ancestrally, MENA Americans trace their roots to twenty-three countries[13] (Abuelezam et al., 2018; Khalil et al., 2020) and South Asians to eight[14]. Recent data indicates that nearly two million MENA and over five million South Asians live the U.S. (Harjanto & Batalova, 2022; SAALT, 2019). The first notable wave of MENA and South Asian emigration to the U.S. occurred after the end of World War I following the end of Ottoman rule and rise of Western colonialism in areas of the Middle East and South Asia (Little, 2022; Bhandari, 2022). MENA immigrants at this time mainly resettled in the northeastern and midwestern U.S. (Little, 2022) and South Asian—mainly Punjabi Sikh migrants—resettled in agrarian communities of San Francisco (*Echoes of Freedom: South Asian Pioneers in California, 1899-1965*, 2020). Events and conflicts throughout the twentieth century, including India's war for independence, the 1946 Luce-Celler Bill[15] (*Echoes of Freedom: South Asian Pioneers in California, 1899-1965*, 2020), the Lebanese Civil War (1975-1990), 1967 Six-Day War, Refugee Relief Act of 1953, and the 1979 Iranian Revolution (Foad, 2013; Little, 2022), continued to give rise to MENA and South Asian migration to the U.S (Immigration and Ethnic History Society, 2019; Little, 2022). The

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13 Bahrain, Iraq, Iran, Israel, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, Syria, the United Arab Emirates, Yemen; North Africa: Algeria, Egypt, Libya, Mauritania, Morocco, Somalia, Sudan, Tunisia.

14 Afghanistan, Bangladesh, Bhutan, India, Myanmar (Burma), Nepal, Pakistan, Sri Lanka (Ceylon) (South Asian Americans Leading Together (SAALT), 2019)

15 Along with the Repeal of Chinese exclusion in 1943, the Luce-Celler Act further undermined Asian exclusion and emphasized foreign relations over racial discrimination by extending naturalization rights and immigration quotas to other key U.S. allies in Asia, the Philippines and India. The Philippines gained independence from the United States in 1946 as did India from Great Britain (*Luce-Celler Act of 1946*, n.d.).

greatest influx of MENA and South Asian, however, did not occur until after the 1965 Hart-Celler Act (also known as the Immigration and Nationality Act) when national origin quotas for U.S. migration were repealed (Chishti et al., 2015; *Echoes of Freedom: South Asian Pioneers in California, 1899-1965*, 2020). By the end of the twentieth century, a steady flow of MENA and South Asian migrants entered the U.S through new visa programs including the 1990s Diversity Visa lottery and the H-1B skilled worker visa programs[16] (*Echoes of Freedom: South Asian Pioneers in California, 1899-1965*, 2020).

With their growing presence in the U.S., MENA and South Asian immigrants are no strangers to discrimination. Like East Asian immigrants, MENA and South Asians are often cast as "model minorities" (Jin, 2021) and following 9/11, they also faced intense levels of anti-Muslim discrimination and violence, otherwise known as "Islamophobia" (Runnymede, 1997). Both stereotypes have proved harmful for these immigrant communities. First, the "model minority" myth generalizes the diverse experiences of MENA and South Asians into a singular, narrow narrative and obscures some of the major differences across MENA and South Asian subgroups (Jin, 2021). For example, South Asian immigrants are often assumed to be high-earning and socioeconomically advantaged (Jin, 2021). However, there are disparities in socioeconomic status across South Asian sub-groups. For example, though Indian American households are among the highest earning in the U.S. at a median annual household income of $127,000 (Jin, 2021), a quarter of Bangladeshis and 10% of Pakistanis live below the federal poverty line (i.e. they earn below a set income that is used by the Department of Health and Human Services (HHS) to determine eligibility for public programs and benefits) (SAALT, 2019). Moreover, MENA Americans are more likely to be unemployed and have lower

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16 The Immigration Act of 1990 allowed employers to hire skilled workers using temporary visas ("Immigration Act of 1990," n.d.).

household incomes than the native-born population in the U.S. (Cumoletti & Batalova, 2018). Following the turn of the century, several South Asian immigrants including those from Afghanistan, Bhutan and Myanmar (following 2010) entered the U.S. as refugees following war and conflict abroad ; Baugh, 2020). Even the undocumented South Asian population has grown especially among Bangladeshis and Indians in California (Warren, 2019; *Unauthorized Immigrant Populations by Country and Region, Top States and Counties of Residence, 2019*, 2019). Still, the perceived collective success of MENA and South Asian immigrants is often lodged against them. Instances when the "model minority" myth has been used to represent the experience of MENA and South Asian immigrants also inadvertently minimize the role that racism has played in their struggles as racial and ethnic minorities (Chow, 2017). For example, following 9/11, over 500 hate crimes and 91 cases of simple and aggravated assaults against individuals of Muslim, MENA, or South Asian background were reported to the FBI (Kishi, 2017). During President Trump's administration, anti-Muslim hate crimes exceeded those perpetrated in 2001 after the attack on the World Trade Center (Kishi, 2017). Furthermore, more policies have been enacted that have unjustly targeted and surveilled Muslim, MENA, and South Asian American communities across the U.S. including the 2001 USA Patriot Act[17] and the 2017 Executive Order 13769[18] ("Muslim Ban") (Ahmed & Senzai, 2004; Samari, 2016).

In this chapter, I wanted to explore the heterogeneity in MENA and South Asian American experiences through an examination of differences in MENA and South Asian resettlement contexts, or their ethnic neighborhoods. Previously, researchers have captured

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17 The USA Patriot Act deterred and punish terrorist acts in the United States and around the world, to enhance law enforcement investigatory tools, and for other purposes . This act was used to justify the heightened surveillance of Muslim communities and community centers (Ahmed & Senzai, 2004).
18 Executive Order 13769 banned citizens of Iraq, Syria, Iran, Libya, Somalia, Sudan and Yemen from entering the United States. This was an executive order by US President Donald Trump and also called the "Muslim Ban" (Protecting the Nation From Foreign Terrorist Entry Into the United States, 2017).

within group diversity in other pan-ethnic communities by examining their neighborhood

contexts (Walton, 2015). In this chapter, I used a similar approach to understand similarities in

MENA and South Asian immigrant resettlement contexts and within group diversity within each

of these pan-ethnic communities. The next section describes several receiving contexts for

MENA and South Asian immigrants within North America. Then, existing scholarship on

receiving contexts in other pan-ethnic immigrant communities is used to theorize potential

patterns of MENA and South Asian neighborhood contexts.

Neighborhood contexts

Most MENA and South Asians immigrants in the U.S. are concentrated in metropolitan

areas of California, Michigan, New York, Texas, Illinois, New Jersey, and Washington, D.C.

(Arab American Institute Foundation, 2018; Budiman & Ruiz, 2021; US Census Bureau, 2017).

Southern California is home two major ethnic neighborhoods including "Little Arabia" in

Anaheim and "Little India" on Pioneer Boulevard in Artesia (J. C. Lee, 2006). Both

neighborhoods have hundreds of MENA- or South Asian-owned businesses, restaurants,

community organizations, and cultural centers (Shukla, 1999) and contribute significantly to

their local economies (Labossiere, 2004). There are also prominent communities of MENA and

South Asian immigrants in the inner-city Midwestern neighborhoods of metro Detroit and the

Minnesota Twin Cities. For example, Dearborn is a popular ethnic enclave for MENA

Americans of Lebanese, Iraqi, and Yemeni descent (Rignall, 1997) while Hamtramck is a

popular destination among Bangladeshi immigrants (Kershaw, 2001). Similarly, several

thousand Somali immigrants live in the inner-city neighborhood of Cedar-Riverside, which is

located just outside of Minneapolis (Corn & Domansky, 2009; Roble & Rutledge, 2008). These

neighborhoods are similar to the inner city Cuban neighborhoods in Miami and Mexican

neighborhoods of Texas and California which have previously been explored in the migration literature as "*ethnic enclaves*" (Portes & Bach, 1985; Portes & Jensen, 1992)*.* Ethnic enclaves are culturally distinct neighborhoods where immigrants of the same ethnic origin are heavily concentrated and maintain a strong cultural and economic presence (Portes & Zhou, 1993; Sanders & Nee, 1992; K. L. Wilson & Portes, 1980; Zhou, 2009). Other popularly studied ethnic enclaves include the historic Chinatowns which first emerged in the mid-19th and early twentieth century, in New York City, San Francisco, and Boston (National Park Service, n.d.) and were later revitalized in the post-1965 immigration era (Zhou, 2009). In addition to maintaining the cultural features of their ethnic community, ethnic enclaves provided newly arrived immigrants with affordable housing, economic activity, and co-ethnic social and professional networks (Hummon, 1996; Iceland & Scopilliti, 2008; Portes, 1981; Portes & Bach, 1985; Portes & Jensen, 1992; Wilson & Portes, 1980; Zhou, 1992).

There is a growing presence of MENA and South Asians in suburban areas across many U.S. and Canadian metropolises ; Qadeer & Kumar, 2006). These suburban immigrant communities are comparable to "*ethnoburbs*", which are post-suburban neighborhoods that have been popularized in the migration literature by recent East Asian immigrants (Lin, 1998; Walton, 2012). Ethnoburbs are known to have low exposure to poverty, high household incomes, and better access to culturally-tailored institutional resources, even when compared to integrated neighborhoods (Zhou, 2007; Zhou & DiRago, 2023). Ethnoburbs provide immigrants a place to live where they can experience upward socioeconomic mobility and high levels of social capital while also maintaining their cultural identity despite the cultural and ethnic diversity of these neighborhoods (Zhou & DiRago, 2023). Not only do these ethnic neighborhoods decrease the need for immigrants to assimilate to the cultural norms of the host society, but they also offer

immigrants a chance to engage with immigrants of diverse racial and ethnic backgrounds (Zhou, 2007; Zhou & DiRago, 2023).

Few studies and some media outlets have identified a select number of MENA and South Asian co-ethnic neighborhoods across the U.S. and highlighted their contributions to their local communities. In some cases, these communities have formed in similar geographic contexts while in others they seem to be in disparate areas. However, there are no studies that formally document MENA and South Asian resettlement contexts in respect to one another or, given their within group diversity, if there are different social and economic patterns within the ethnic neighborhoods that MENA and South Asian immigrants form. In this chapter, first, I explored if MENA and South Asian immigrants form prominent ethnic neighborhoods in similar geographic areas. Then, I explored if there were social and economic differences in the types of ethnic neighborhoods that MENA and South Asian immigrants formed, and if based on these differences, MENA and South Asian ethnic neighborhoods could be organized according to a typology driven by existing theories of assimilation and acculturation. In this study, I focused on the MENA and South Asian immigrant community in California since it is home to the largest MENA and South Asian populations in the U.S (Harjanto & Batalova, 2022; Perez et al., 2021; SAALT, 2019). Finally, I examined if there were individual-level sociodemographic differences among the MENA and South Asian immigrants in California by the type of ethnic neighborhood in which they lived.

Conceptual Framework

This study integrates the concept of hyperdiversity and spatialization (Zhou & DiRago, 2023) and various theories of assimilation, including classical assimilation theory (MacDonald & MacDonald, 1964; Zhou, 1992), place stratification theory (C. Z. Charles, 2003), segmented

assimilation theory (Portes & Zhou, 1993; Zhou, 1997), spatial assimilation theory (Massey & Denton, 1985; Orum, 2019; T. Wen, 2019), and the resurgent ethnicity perspective (Walton, 2012, 2015; T. Wen, 2019).

Hyperdiversity refers to the phenomenon through which intra-ethnic and inter-ethnic diversity intersect along a wider array of parameters, including lifestyles, attitudes, and practices (Tasan-Kok et al., 2014). Hyperdiversity acknowledges that immigrants within one ethnic group may have identities that overlap with other racial and ethnic groups that do not necessarily fit within the Black-White racial dichotomy, and have heterogeneity among themselves (Kraftl et al., 2019; Miyares, 2004; Tasan-Kok et al., 2014; Zhou & DiRago, 2023; Zhou & Yang, 2022). The MENA and South Asian immigrant communities are examples of pan-ethnic communities that are hyperdiverse – both immigrant groups are culturally, linguistically, religiously, and ancestrally diverse (Abuelezam et al., 2018; Khalil et al., 2020; South Asian Americans Leading Together (SAALT), 2019). Spatialization refers to the formation of new axes of social difference by virtue of a shared residential context, including with members of different ethno-racial demographic categories. Spatialization can occur between groups, such as geographically interlaced ethno-racial populations who face similar structural inequalities in certain domains while occupying different positions in other social hierarchies. MENA and South Asian immigrants also may experience spatialization with respect to each other given their shared migration trajectories and experiences in the host society. As such, they may resettle in shared geographic despite their differences in national origin and race (Zhou & DiRago, 2023).

Next, I used the classical assimilation theory, place stratification theory, segmented assimilation theory, spatial assimilation theory, the resurgent ethnicity perspectives to develop the ethnic neighborhood typology. First, the classical assimilation theory posits that overtime,

immigrant norms, behaviors, and characteristics will follow a "straight-line" convergence with those of the dominant members of the host society (Bean & Brown, 2006). This, paired with a chain-migration orientation which is described as a process where "prospective migrants learn of opportunities . . . and have initial accommodation and employment arranged by means of primary social relationships with previous migrants" (MacDonald & MacDonald, 1964) create opportunities for newly arrived, especially low-skill immigrants, to live among immigrants of a shared cultural and linguistic background and have a source of familiarity and opportunity in the U.S. (Zhou 1992). Next, the place stratification theory, asserts that dominant members of the host society have been able to manipulate space to maintain their physical and social separation from groups that they view as undesirable (C. Z. Charles, 2003; Logan & Molotch, 2007). As result, racial and ethnic minorities may be unable to resettle in neighborhoods that are socioeconomically advantaged and have better quality resources and institutions (C. Z. Charles, 2003; Logan & Molotch, 2007). Instead, newly arrived immigrants resettle in urban centers with members of their own co-ethnic community or kin (Chimbos & Agocs, 1983; Portes & Jensen, 1989). Rejection from members of the host society empowers immigrants to form their own ethnic neighborhoods which are built on solidarity for mutual assistance and cultural security (Takaki 1989). These areas are better known as ethnic enclaves, which are geographic areas with high ethnic concentration, that uphold a strong cultural identity and have flourishing economic activity (Hummon, 1996). In addition to providing economic success, ethnic enclaves offer their residents strong migrant networks and high social capital which they can capitalize on in exchange for tangible resources, such as information on employment opportunities, affordable housing, and government assistance programs (C. Z. Charles, 2003; Logan & Molotch, 2007). Tangible and intangible resources that come out of ethnic enclaves heighten the incentive

to stay in these neighborhoods even though they may normally be considered undesirable places to live among dominant members of the host society (Logan & Alba, 1993). Other perspectives on place stratification suggest that the barriers to moving into more advantaged neighborhoods are higher for racial and ethnic minorities compared to members of the majority, which disincentivizes immigrants from moving out (Logan & Alba, 1993).

Next, I used the segmented assimilation theory and place stratification theory to understand another type of inner-city ethnic neighborhood formation. According to the segmented assimilation theory, immigrants whose ethnic communities cannot provide leverage for social mobility will have children who will ultimately be unable to residentially integrate into predominantly White, upper-middle class neighborhoods, and will instead integrate into disadvantaged, racially-segregated neighborhoods with U.S.-born co-ethnics and other racialized minorities (Portes & Zhou, 1993; South et al., 2008). Whether these ethnic neighborhoods are formed in response to the discrimination and constraint predicted by place stratification, or by individual and group horizontal or downward mobility as predicted by segmented assimilation, the result is an economically disadvantaged and socially disorganized ethnic context dominated by a "poverty paradigm" (Morenoff & Lynch, 2004; Williams & Collins, 2016). These neighborhoods also tend to be characterized by crime, gangs, dilapidated housing, and failing schools (Morenoff & Lynch, 2004; Williams & Collins, 2016). Prior literature describes such ethnic neighborhoods as communities of constraint and characterizes them as having a high concentration of U.S.-born individuals who are socioeconomically disadvantaged.

On the other hand, the spatial assimilation theory posits that as immigrants social status rises, minorities attempt to improve their spatial position by moving into predominantly White, upper-middle class suburban neighborhoods (Massey & Denton, 1985; Orum, 2019; T. Wen,

2019). These suburban ethnic contexts are better known as "ethnoburbs", which are suburban clusters in residential areas where one ethnic group has significant concentration but does not necessarily comprise the majority (Li, 1998; Trinh Vo & Yu Danico, 2004). The tendency of minorities clustering in neighborhoods that are geographically distant from their traditional gateways is not only improving their social and economic mobility in the U.S., but is also influencing demographic trends in ethno-racial diversity across the country (Fischer & Tienda, 2006; Hall, 2013; Hall et al., 2016; Massey, 2008).

Finally, according to the resurgent ethnicity theory, immigrants and U.S.-born ethnic minorities who already have high socioeconomic status have little to gain from spatial integration with whites and much to gain from living among others of the same ethnicity (Logan et al., 2002; M. Wen et al., 2009). Therefore, instead of trying to move into integrated neighborhoods, the resurgent ethnicity theory posits that immigrants who have high socioeconomic status prefer to live in less integrated neighborhoods. Such neighborhoods offer immigrants access to high-quality education and access to institutional resources (Zhou, 2007) while maintaining their ability to live in a neighborhood where their cultural identity is preserved (Aguilar-San Juan, 2009). These neighborhoods offers immigrants professional opportunities, well connected social networks, and high social capital, while also decreasing their chances of assimilating with the dominant culture (Zhou, 2007).

Classical assimilation theory, place stratification theory, segmented assimilation theory, spatial assimilation theory, and the resurgent ethnicity perspective suggest that immigrant resettlement may follow a few different trajectories depending on the timing of their arrival to the U.S., their awareness of existing co-ethnic networks and resources before emigrating, and their access to socioeconomic resources. These factors may influence the urbanicity of their areas

of resettlement, the ethno-racial dynamics of their communities, and social and economic mobility of those areas. In this study, I synthesized aspects of each of these theories to develop an ethnic neighborhood typology fitting for MENA and South Asian Americans which could be widely applied to understand their lived experiences and health.

Figure 1. Conceptual model of geographic, social, and economic dimensions of MENA and South Asian American neighborhood contexts
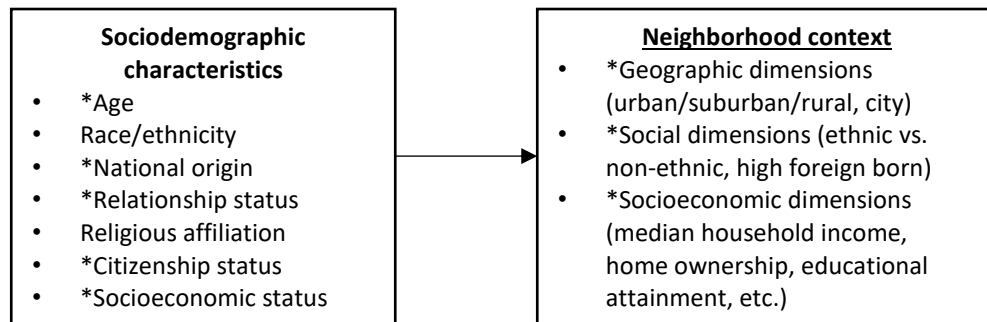
Sociodemographic characteristics	Neighborhood context
• *Age • Race/ethnicity • *National origin • *Relationship status • Religious affiliation • *Citizenship status • *Socioeconomic status	• *Geographic dimensions (urban/suburban/rural, city) • *Social dimensions (ethnic vs. non-ethnic, high foreign born) • *Socioeconomic dimensions (median household income, home ownership, educational attainment, etc.)

Methods

Data

      This study used data from the American Community Survey (ACS), which is a nationwide survey that collects annual data on social, economic, housing, and demographic characteristics of the U.S. population (ACS, 2023). The study used the 2020 ACS 5-year estimates which includes 60 months of data from 2016 to 2020, a large sample, and smaller margins of error, allowing for increased statistical reliability for smaller geographic areas and population groups compared to the ACS 1-year estimates (U.S. Census Bureau, 2020). Over 3.5 million households and group quarters[19] were contacted to participate in the ACS from a sampling frame provided by the Census Bureau's official inventory of known living quarters and

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19 Group quarters are where people stay in group living arrangements that are owned or managed by an organization providing housing and/or services for the residents (e.g., college residence halls, skilled nursing facilities, group homes, and correctional facilities) (Chapter 8, ACS Design & Methodology, 2014).

nonresidential units in the U.S. (Poehler, 2022a). Response rates for household units in California ranged from 94.4% to 69.9% from 2016 to 2020 and 94.6% to 35.3% for group quarters (GQs) (see Appendix A) (*Response Rates California*, 2022). For household units the data was collected by Internet, mail, telephone, and personal visit, and in GQs data was collected by a field representative using the computer-assisted personal interview (CAPI). Respondents could use a bilingual (Spanish or English) self-report questionnaire if they were unable to complete a CAPI (Poehler, 2022c). Cartographic spatial boundary data from the 2010 U.S. Census was also used for this study.

Sample

The individual level sample included all California respondents (N=1,816,306). All respondents in the sample were used to develop the neighborhood level measures across the sample of all public use microdata areas (PUMAs) in California (N=265). There was also a sub-sample of MENA and South Asians living in California aged 18 years and older (MENA: N=22,165; South Asian: N=30,563). MENA and South Asian origin were defined using measures for place of birth and mother or father's place of birth[20] (see Appendix B).

Measures

Neighborhood measures.

Neighborhood. The neighborhood was defined as a public use microdata area (PUMA), which is a statistical geographic areas with non-overlapping boundaries that have a minimum population of 100,000 (*Public Use Microdata Areas (PUMAs)*, 2022). PUMAs were the smallest

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20 MENA included those who were born or had at least one parent who was born in Bahrain, Iraq, Iran, Israel, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, Syria, the United Arab Emirates, Yemen (Middle East) or Algeria, Egypt, Libya, Morocco, Somalia, Sudan, South Sudan, Tunisia (& North Africa). South Asians included those who were born or had at least one parent born in Afghanistan, Bangladesh, Bhutan, India, Myanmar (Burma) Nepal, Pakistan, Sri Lanka (Ceylon).

geographic area unit available through the ACS public use microdata. Neighborhoods were assessed with respect to their geographic, social, and economic dimensions (see Table 1).

  Geographic dimensions. Geographic dimensions examined in this study included county classification "urban", "suburban" or "rural" and city or non-city (0=non-city, 1=city). City classification was based on an a four-level ACS measure of the type of metropolitan area.

  Social dimensions. Social dimensions of the neighborhood were assessed using an indicator of co-ethnic density (defined as the proportion of individuals of MENA or South Asian ethnic origin who lived within a neighborhood) and whether it was an integrated or immigrant neighborhood. Categories of co-ethnic density in this study including: 1) low MENA and South Asian co-ethnic density, 2) high MENA co-ethnic density, 3) high South Asian co-ethnic density, and 4) high South Asian and MENA co-ethnic density. High co-ethnic density was defined as a MENA or South Asian concentration of at least 1.8% in a neighborhood. This was based on kernel density curves, which indicated that the midpoint of the upper interquartile range (IQR) for the proportion of MENA across all neighborhoods in California was 1.4% (midpoint: 1.4%, $\text{IQR}_{\text{upper limit}}$: 0.1%-1.8%) and 1.8% for South Asians (midpoint: 1.8%, $\text{IQR}_{\text{upper limit}}$: 1.1%-2.4%) (see Appendix C). Prior studies have defined co-ethnic neighborhood as areas with co-ethnic densities that ranged from 10% (East Asians in Los Angeles) (Bobo et al., 2000) to 25% (East Asians in Monterey Park) (Horton, 2010). However, the East Asian immigrant population is considerably larger in California relative to MENA and South Asians (15% East Asian, and 3% MENA and South Asian) (Kim, 2009; US Census Bureau, 2017). A co-ethnic density of 1.8% was considered an appropriate threshold for high co-ethnic density MENA and South Asian Americans since this study used a larger spatial boundary area (PUMAs) to define the neighborhood compared to prior studies that have used the census-tract or zipcode to explore co-

ethnic neighborhoods in other immigrant populations Bécares, 2014; Lê-Scherban et al., 2014).

A similar method was also used in other studies. Bécares, 2014; Lê-Scherban et al., 2014)

Next, if a neighborhood had foreign-born density (concentration of foreign-born residents in a neighborhood) below 31% it was considered "integrated" (i.e. with the dominant society of U.S.-born natives) and if a neighborhood had a foreign-born density of 31% or more, it was considered an "immigrant" neighborhood. The threshold of 31% foreign-born within a neighborhood was used because it was the midpoint of the upper IQR ($IQR_{upper\ limit}$: 26.5-35.0%).

Socioeconomic dimensions. Neighborhood-level socioeconomic status was assessed using the percent college-educated ($\geq$ 25 years or older), median household income, and percent home ownership within a neighborhood (see Table 2). In 2019, 34% of adults aged 25 and older in California had at least a bachelor's degree (Perez et al., 2021); therefore, if at least 34% of the residents in a neighborhood over the age of 25 were college-educated, the neighborhood was classified as having "high" neighborhood-level educational attainment (Bauman & Graf, 2003).

Neighborhood-level median annual household income was estimated as the sum of all incomes within a household for individuals aged 15 years and older which were recorded in the ACS (Guzman, 2022). The measure was recoded as a three-level categorical measure (0=low (< \$90,000), 1=middle (\$90,000-\$149,999), 2= high ($\geq$ \$150,000). These categories were based on a combination of factors. First, in 2018, the average household income in California was estimated to be approximately \$70,489 (*Quickfacts*, n.d.); however, in the Bay Area and Greater Los Angeles Area, where most MENA or South Asian ethnic neighborhoods in the state resided, median household incomes were higher than the state average (*Quickfacts*, n.d.). Therefore, higher income thresholds were used to define low, middle, and high median household income.

Neighborhood-level home ownership was assessed using a three-level categorical measure of home ownership from the ACS (U.S. Census Bureau, 2023; Perez et al., 2021). In 2018, 55% of Californians were homeowners (US Census Bureau, 2018). Therefore, 55% was used as the threshold for "high" neighborhood-level home ownership.

For the ethnic neighborhood typology, measures of neighborhood-level educational attainment, median annual household income, and home ownership were made into a composite measure of neighborhood-level socioeconomic status. If the indicator for neighborhood-level educational attainment, median annual household income, or home ownership met the threshold for "high", it was assigned a score of 1 (for median annual household income "middle" and "high" median household incomes were given a score of "1"). The composite measure for neighborhood-level had a minimum score of 0 and maximum score of 3. Neighborhoods that had a neighborhood-level socioeconomic status score of 2 or more were classified as having "high" neighborhood-level socioeconomic status.

Individual measures. This study also examined several sociodemographic indicators and a health access indicator. Sociodemographic characteristics of the sample that were assessed included age (0=18-24 years, 1=25-34 years, 2=35-44 years, 3=45-59 years, 4=60 years or older), sex (0=male, 1=female), nativity (0=foreign-born, 2=U.S. born), marital status (0=never married, 1=married, 2=previously married (includes widowed, divorced, separated), and household size (0= < 5, 1= ≥ 5). Migration characteristics assessed in the study included citizenship status (0=U.S.-born citizen, 1=naturalized citizen, 2=non-citizen), country of origin (MENA: 0=Iran, 1=Iraq, 2=Israel/Palestine, 3=Lebanon, 4=Syria, 5=Egypt, 6=other MENA nation; South Asian: 0=Afghanistan, 1=Bangladesh, 2=Burma, 3=India, 4=Pakistan, 5=other South Asian nation), years in the U.S. (0 = < 15 years, 1= ≥ 15), English proficiency (0=does not

Speak English or does not speak English well, 1=speaks English well or only speaks English), and linguistic isolation (0=no or not applicable, 1=yes). Socioeconomic characteristics included educational attainment (0=high school/GED or less, 1=some college or Associate's degree, 2=Bachelor's degree, 3=Graduate degree (M.S., M.A., professional degree, or doctorate), total household income (0=low (< $90,000), 1=middle ($90,000-$149,999), 2=high ($\geq$ $150,000)), percent below the federal poverty level (FPL; 0= 0-99%, 1=100-199%, 2=200-299%, 3=300-399%, 4= $\geq$ 400%). Health access was measured using an indicator of health insurance status (0= uninsured, 1=public health insurance, 2=private health insurance (includes those with public *and* private health insurance).

<u>Analysis</u>

First, I described geographic, sociodemographic, and health access characteristics of the MENA and South Asians in the sample (Table 2). Next, I created a map to geographically represent where MENA and South Asians ethnic neighborhoods were located (Figure 2). Then, I described geographic, social, and economic characteristics of MENA and South Asian co-ethnic neighborhoods by their co-ethnic density (Tables 3 and 4). The analyses and the theories described in Chapter 3 were used to develop an ethnic neighborhood typology that included four types of MENA and South Asian ethnic neighborhoods (Figure 3). Pearson chi-square tests were used to examine differences in sociodemographic and health access characteristics of MENA and South Asians in California by ethnic neighborhood type (Table 5 and Table 6).

Table 1. Definitions for neighborhood-level measures

Variable	Definition	Categories
Individual-level characteristics		
MENA or South Asian race/ethnicity	<u>MENA:</u> born in Bahrain, Iraq, Iran, Israel, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, Syria, the United Arab Emirates, Yemen; North Africa: Algeria, Egypt, Libya, Mauritania, Morocco, Somalia, Sudan, Tunisia or U.S.-born with at least one parent born in one of the aforementioned countries; <u>South Asian:</u> born in Afghanistan, Bangladesh, Bhutan, India, Myanmar (Burma) Nepal, Pakistan, Sri Lanka (Ceylon) or U.S.-born with at least one parent born in one of the aforementioned countries.	1. MENA 2. South Asian 3. Not MENA or South Asian
Nativity	Anyone born outside of one of the fifty U.S. states or in a U.S. territory was considered foreign-born.	1. U.S.-born 2. Foreign-born
Annual household income	Sum of all annual household incomes among those present in a household who were ≥ 15 years.	1. Low (< $90,000) 2. Middle ($90,000-$149,999) 3. High (≥ $150,000)
Educational attainment	Highest grade of school (household member) completed, or the highest degree (household member) has received for individuals ≥ 25 years.	1. Completed a college degree 2. Did not complete at least a college degree
Home ownership	Three-category measure of home ownership, which included the responses "not applicable", "owned or being bought (loan)", and "rented". Those who said "owned or being bought (loan)" were considered homeowners	1. Not a homeowner 2. Homeowner
Neighborhood-level characteristics		
Neighborhood	a public use microdata area (N=265)	

Geographic dimensions
  Urban-suburban-rural
  classification
	Indicated whether the household resided within an urban, suburban, or rural county	1. Urban
		2. Suburban
		3. Rural

Social dimensions Co-ethnic density	Proportion of MENA or South Asians in a neighborhood (High $\geq$ 1.8%)	1. Low MENA and South Asian co-ethnic density 2. High MENA co-ethnic density only 3. High South Asian co-ethnic density only 4. High MENA *and* South Asian co-ethnic density
Ethnic neighborhood	Proportion of MENA or South Asians in a neighborhood $\geq$ 1.8% (mutually exclusive of each other)	1. MENA ethnic neighborhood 2. South Asian ethnic neighborhood 3. Not a MENA or South Asian ethnic neighborhood
Foreign born density	Percentage of foreign born residents in a neighborhood.	1. Integrated ($<$ 31% foreign-born 2. Immigrant ($\geq$ 31% foreign-born)
Socioeconomic dimensions Median annual household income	Median annual household income in a neighborhood.	1. Low ($<$ \$90,000) 2. Middle (\$90,000-\$149,999) 3. High ($\geq$ \$150,000)
Percent college graduates	Percentage of adults $\geq$ 25 years who have completed a bachelor's degree within a neighborhood.	1. High ($\geq$ 33% graduated college) 2. Low ($<$ 33% graduated college)
Percent home ownership	Percentage of homeowners in a neighborhood.	1. High: $\geq$ 55% are homeowners 2. Low: $<$ 55% are not homeowners
Socioeconomic status index	Composite score for neighborhood-level socioeconomic status that uses the three socioeconomic status indicators. Each indicator of neighborhood-level socioeconomic status that	1. High: $\geq$ 2 neighborhood-level socioeconomic status score 2. Low: $<$ 2 neighborhood-level socioeconomic status score

	met the threshold of "high" was assigned a score of 1 (e.g. middle or high neighborhood median household income ($\geq$ \$90,000), high neighborhood percent college education ($\geq$34%), or high percent neighborhood home ownership ($\geq$ 55%)).	
Ethnic neighborhood type	Ethnic neighborhood type based on social and socioeconomic dimensions of the neighborhood.	1. Non-co-ethnic neighborhood (Neighborhood has < 1.8% MENA or South Asian co-ethnic density) 2. Disadvantaged immigrant neighborhood ($\geq$ 1.8% MENA or South Asian co-ethnic density, immigrant neighborhood, and low socioeconomic status) 3. Disadvantaged integrated neighborhood ($\geq$ 1.8% MENA or South Asian co-ethnic density, integrated neighborhood, and low socioeconomic status) 4. Advantaged immigrant neighborhood ($\geq$ 1.8% MENA or South Asian co-ethnic density, immigrant neighborhood, and high socioeconomic status) 5. Advantaged integrated neighborhood ($\geq$ 1.8% MENA or South Asian co-ethnic density, integrated neighborhood, and high socioeconomic status)

Results

Sociodemographic characteristics of MENA and South Asian Americans in California

MENA. Approximately 9% of the MENA sample was 18-24 years, 17% were 25-34

years, 17% were 35-44 years, 30% were 45-59 years, and 30% were 60 or older. Approximately

92% were foreign-born and 24% were non-citizens. The most common country of origin for MENA respondents was Iran, hailing 45% of the MENA population. However, there were a considerable proportion of Iraqi, Israeli or Palestinian, Lebanese, Syrian, and Egyptians in the sample. Nearly 85% of MENA spoke English well (or only English) and 17% lived in a large household ($\geq$ 5 individuals in the household). Nearly half of MENA Americans over 25 years of age had a college degree, and 30% had a high annual household income ($\geq$ $150,000). About 6% of MENA were uninsured (Table 2).

South Asians. Approximately 8% of South Asian in the sample were between the ages of 18-24 years, 27% were 25-34 years, 26% were 35-44 years, 22% were 45-59 years, and 18% were 60 or older. (Table 2). Approximately 95% of South Asians were foreign-born and 44% were non-citizens. The most common South Asian country of origin was India (75%) followed by Pakistan (8%) and Afghanistan (6%). Approximately 90% spoke English well and nearly a quarter (23%) lived in large households. Nearly 70% of South Asians over 25 years had a college degree, 50% had a high annual household income, 8% lived below the federal poverty level, and 4% were uninsured (Table 2).

Table 2. Characteristics of MENA and South Asians in California (N=57,728)

	MENA N=22,165 Weighted %	South Asian N=30,563 Weighted %	p-value
Age			
18-24	9.4	8.3	***
25-34	16.6	27.1	
35-44	17.1	25.6	
45-59	26.5	21.5	
60+	30.5	17.5	
Sex			
Male	51.4	52.1	0.635
Female	48.6	47.9	
Nativity			
Foreign-born	92.1	95.0	***
U.S.-born	7.9	5.0	
Marital status			
Never married	25.5	20.3	***
Married	57.6	72.0	
Previously married	16.9	7.7	
Household size ≥ 5	17.1	22.9	***
Citizenship			
U.S.-born citizen	11.8	6.3	***
Naturalized citizen	64.7	49.5	
Non-citizen	23.6	44.2	
MENA country of origin			
Iran	45.0		
Iraq	8.3		
Palestine/Israel	7.1		
Lebanon	7.3		
Syria	5.9		
Egypt	8.0		
Other MENA nation	18.4		
South Asian country of origin			
Afghanistan		6.0	
Bangladesh		2.4	
Burma		4.0	
India		75.5	
Pakistan		8.4	

Other		3.7	
Lived in the U.S. $\geq$ 15 years[b]	42.2	57.5	***
Speaks English well	83.9	90.1	***
Linguistically isolated	17.7	9.3	***
County classification			
Urban	92.3	91.0	***
Suburban	6.6	6.7	
Rural	1.1	2.3	
Lives in a city	35.7	16.6	***
Educational attainment[c]			
$\leq$ High school	30.1	20.0	***
Some college	24.2	13.6	
Bachelor's degree	26.2	30.2	
Graduate degree	19.6	36.2	
Annual household income			
Low income (< $90,000)	50.6	28.5	***
Middle income ($90,000-$149,999)	19.6	22.1	
High income ($\geq$ $150,000)	29.8	49.4	
% Federal poverty level (FPL)			
0-99%	15.3	8.2	***
100-199%	15.2	9.0	
200-299%	12.3	9.4	
300-399%	9.9	8.5	
$\geq$ 400%	47.2	64.9	
Health insurance status			
Uninsured	6.2	3.9	***
Public health insurance	34.5	20.2	
Private health insurance[d]	59.3	75.9	

Notes: a. Results are representative to population estimates; b. MENA $N_{immigrant}$=20,480, South Asian $N_{immigrant}$=29,050; c. $N_{MENA \geq 25 \text{ years}}$ =20,163; $N_{South Asian \geq 25 \text{ years}}$ = 27,979; d. Includes those with public *and* private health insurance. e. *p<0.05, **p<0.01, ***p<0.001.

Figure 2. Geographic depiction of MENA and South Asian co-ethnic neighborhoods ($N_{neighborhood}$=265)

MENA (N=22,165)　　　　　　　　　　　　　South Asian (N=30,563)

High proportion of MENA or South Asian ($\geq$1.8%)
Low proportion of MENA or South Asian (<1.8%)

81
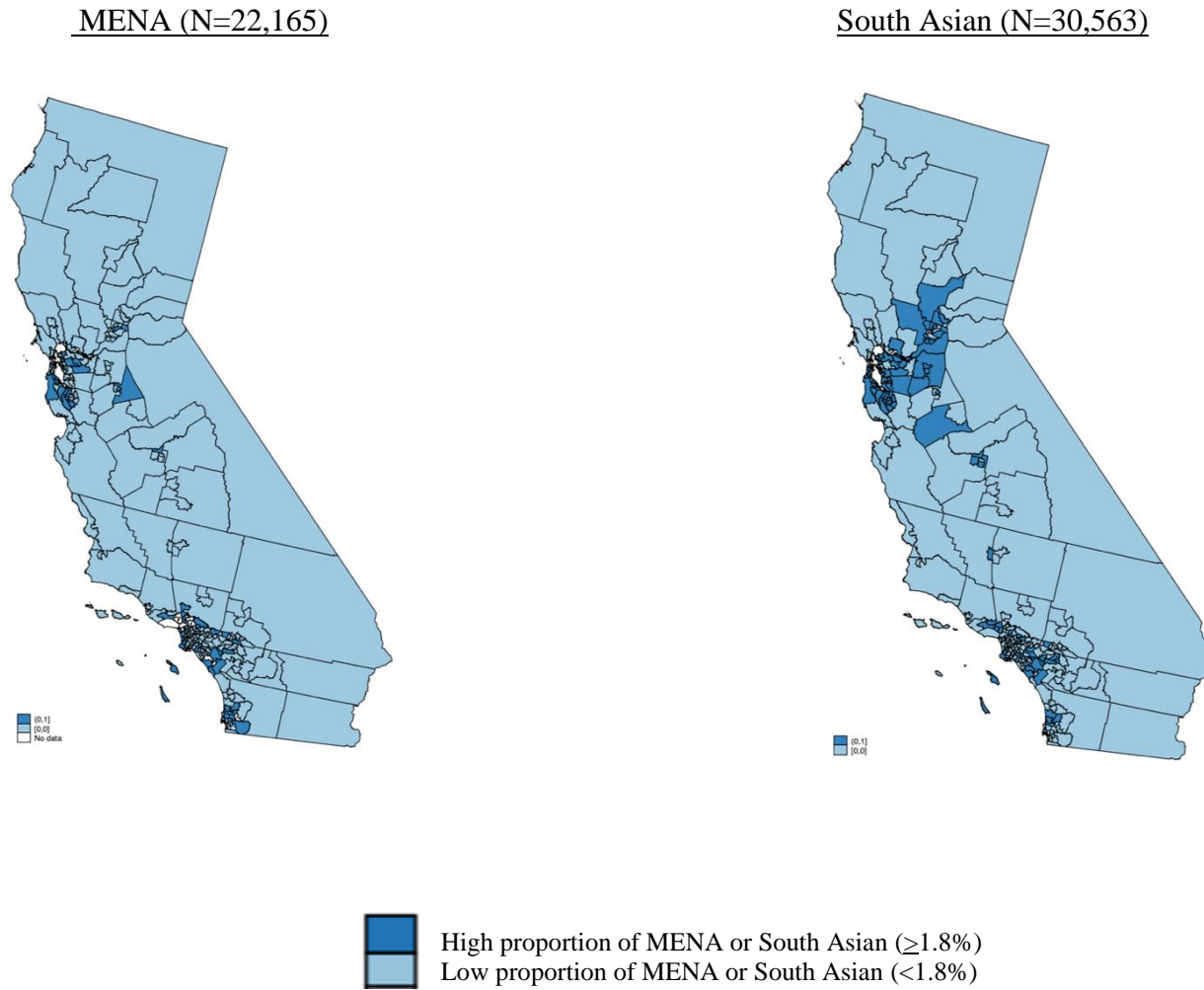
Neighborhood characteristics.

Co-ethnic density. Nearly 11% (N=28) of the neighborhoods in California had a high MENA co-ethnic density and 21% (N=55) had high South Asian co-ethnic density (mutually exclusive of each other). Only 14% (N=37) of the neighborhoods in California had a high co-ethnic density of both MENA *and* South Asians (Table 3; i.e. a population that was at least 1.8% MENA *and* 1.8% South Asian (e.g., Irvine City, Orange County)).

Geographic dimensions. Neighborhoods with high MENA co-ethnic density were mainly located in Los Angeles County, Orange County, San Diego County, San Bernardino County, and Contra Costa County (Appendix D includes a list of MENA ethnic neighborhoods). Neighborhoods with high South Asian co-ethnic density were mainly in Alameda, Contra Costa, Los Angeles, Orange County, Santa Clara, Sacramento, San Francisco, Riverside, San Joaquin, San Mateo, and Ventura (Appendix E includes a list of South Asian ethnic neighborhoods). Most neighborhoods with a high MENA (87%) or South Asian (96%) co-ethnic density, and MENA *and* South Asian co-ethnic density (97%) were in urban counties (see Appendix F). Additionally, 40% of exclusively neighborhoods with high MENA co-ethnic density were in a central city compared to 20% of neighborhoods with only high South Asian co-ethnic density and 30% of neighborhoods with high MENA *and* South Asian co-ethnic density (Table 3).

Social and socioeconomic dimensions. Approximately 32% of neighborhoods with high MENA co-ethnic density were immigrant neighborhoods, compared to 47% of neighborhoods with high South Asian co-ethnic density and 62% of neighborhoods with high MENA *and* South Asian co-ethnic density. About 30% of neighborhoods with high MENA *and* South Asian co-ethnic density had a high median annual household income compared to 13% of neighborhoods with high MENA co-ethnic density, and 11% of neighborhoods with high South Asian co-ethnic

density and 2% of neighborhoods with low MENA and South Asian co-ethnic density (Table 4). Neighborhoods with high MENA *and* South Asian co-ethnic density also had the highest prevalence of college graduates (57%) and home ownership (58%) (see Appendix F).

Co-ethnic neighborhood classifications. Five neighborhood types emerged from the analysis for MENA and South Asians, including non-co-ethnic neighborhood (low MENA and South Asian co-ethnic density), the disadvantaged immigrant co-ethnic neighborhood, the disadvantaged integrated co-ethnic neighborhood, the advantaged immigrant co-ethnic neighborhood, and the advantaged integrated co-ethnic neighborhood. All four co-ethnic neighborhood types had a high MENA or South Asian co-ethnic density. The disadvantaged immigrant co-ethnic neighborhoods had high foreign-born density ($\geq 31\%$) and low neighborhood-level socioeconomic status. Disadvantaged integrated co-ethnic neighborhoods had low foreign-born density ($< 31\%$) and low neighborhood-level socioeconomic status. Advantaged immigrant co-ethnic neighborhoods high foreign-born density and high neighborhood-level socioeconomic status. Finally, advantaged integrated neighborhoods had a low foreign-born population and high neighborhood-level socioeconomic status (see Figure 3). Among MENA, approximately 34% lived in a non-co-ethnic neighborhood, 22% lived in a disadvantaged immigrant co-ethnic neighborhood, 8% lived in a disadvantaged integrated co-ethnic neighborhood, 17% lived in an advantaged immigrant co-ethnic neighborhood, and 19% lived in an advantaged integrated co-ethnic neighborhood. South Asians were most prevalent in the advantaged immigrant co-ethnic neighborhoods (42%) followed by non-co-ethnic neighborhoods (21%) and least prevalent in disadvantaged integrated (8%) and disadvantaged immigrant neighborhoods (10.0%).

Table 3. Geographic, social, and socioeconomic dimensions of neighborhoods by MENA and South Asian co-ethnic density (N=265)

	Low MENA & South Asian co-ethnic density	High MENA co-ethnic density only	High South Asian co-ethnic density only	High MENA & South Asian co-ethnic density
	N=145	N=28	N=55	N=37
	54.7%	10.6%	20.8%	14.0%
Geographic dimensions				
County geographic classification				
Urban	71.0	96.4	87.3	97.3
Suburban	20.7	3.6	10.9	2.7
Rural	8.3	0.0	1.8	0.0
City	13.1	39.9	20.0	20.0
Social dimensions				
Immigrant neighborhood	31.0	32.1	47.3	62.2
Socioeconomic dimensions				
Median annual household income				
Low	69.0	39.3	30.9	8.1
Middle	29.0	50.0	56.4	62.6
High	2.1	10.7	12.7	29.7
College graduates	33.3	52.5	43.0	57.2
Home ownership	54.3	52.0	57.0	58.2

Figure 3. Ethnic neighborhood typology classification for MENA and South Asian Americans
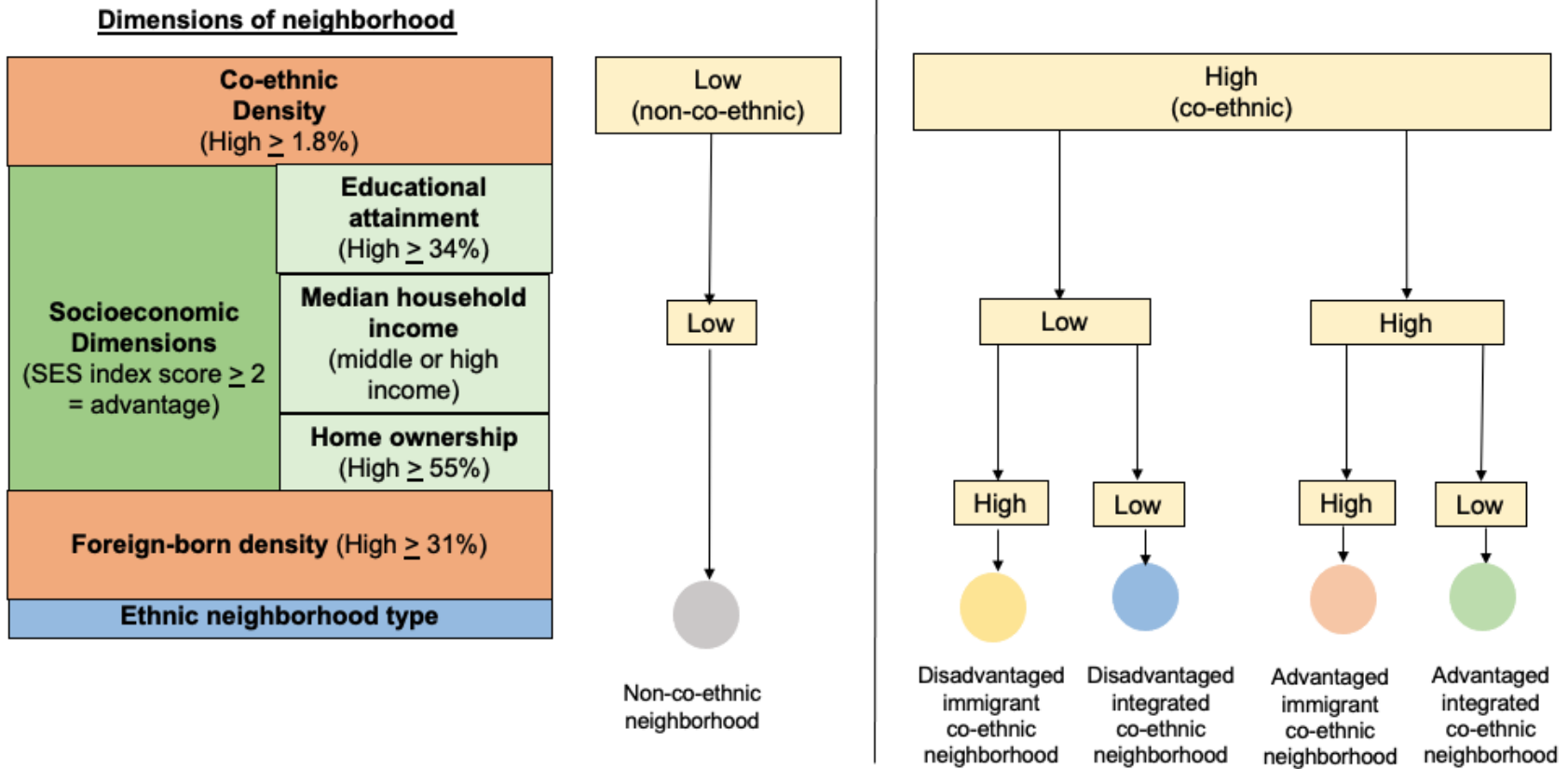
Table 4. Population distribution of MENA and South Asians in California by ethnic neighborhood type

	MENA (N=22,165)	South Asian (N=30,563)
Ethnic neighborhood type		
Non-co-ethnic neighborhood	33.8	21.2
Disadvantaged immigrant co-ethnic neighborhood	22.3	10.0
Disadvantaged integrated co-ethnic neighborhood	7.7	8.3
Advantaged immigrant co-ethnic neighborhood	17.3	42.0
Advantaged integrated co-ethnic neighborhood	19.0	18.6

Characteristics of MENA and South Asian Americans in California by co-ethnic neighborhood

Among MENA, there were significant bivariate differences in household size, migration, and socioeconomic characteristics by ethnic neighborhood type (Table 5). For example, disadvantaged integrated co-ethnic neighborhoods had the highest prevalence of large household size (27%) relative to all other types of MENA co-ethnic neighborhoods (12%-15%; p<0.001). Iranians were the most prevalent MENA ethnic subgroup in disadvantaged immigrant, advantaged immigrant, and advantaged integrated co-ethnic neighborhoods (55%-60%), while Iraqis were the most prevalent subgroup in disadvantaged integrated co-ethnic neighborhoods (55%). Non-citizens were least prevalent in the advantaged integrated co-ethnic neighborhoods (18%) followed by disadvantaged integrated co-ethnic neighborhoods (30%) while citizens (includes those U.S.-born and naturalized) made up 77%-80% in the advantaged immigrant and advantaged integrated co-ethnic neighborhoods (p<0.001). The ability to speak English well was lowest and linguistic isolation was highest in disadvantaged immigrant and disadvantaged integrated co-ethnic neighborhoods (p<0.001). In terms of socioeconomic status, living below FPL was most prevalent among those living in disadvantaged integrated co-ethnic neighborhoods (25%) and lowest in advantaged immigrant and advantaged integrated co-ethnic neighborhoods (10-11%, p<0.001). Advantaged immigrant and integrated co-ethnic neighborhoods also had MENA with the most prevalence for high income households (about

43% and 41%, respectively; p<0.001) and having at least a college degree (56%-61%; p<0.001). There was no significant difference in having any health insurance among MENA by ethnic neighborhood type, but private health insurance was least prevalent in the disadvantaged integrated neighborhoods (44%) and most common in the advantaged integrated and advantaged immigrant co-ethnic neighborhoods (71%-72%; p<0.001).

South Asians. For South Asians, disadvantaged integrated co-ethnic neighborhoods had significantly more large households (43%) compared to all other types of neighborhoods (16%-27%; p<0.001; Table 6). Non-citizens were most prevalent in the disadvantaged immigrant and advantaged immigrant co-ethnic neighborhoods (50%) compared to disadvantaged integrated (38%) and advantaged integrated co-ethnic neighborhoods (40%), and non-co-ethnic neighborhoods (36%; p<0.001). The ability to speak English well was least prevalent in the disadvantaged integrated co-ethnic neighborhoods (75%), where linguistic isolation was also the highest (21%). Those living in the disadvantaged integrated co-ethnic neighborhoods had the highest proportion of South Asians living below FPL (17%) followed by the non-co-ethnic neighborhood (14%). The greatest share of South Asians with a high income and at least a college degree lived in advantaged immigrant co-ethnic neighborhoods (64% and 82%, respectively). At least 94% of South Asians in each neighborhood had health insurance, however, the prevalence of having private health insurance was significantly higher in the advantaged immigrant co-ethnic neighborhoods (87%), followed by the advantaged integrated co-ethnic neighborhoods (80%). Private health insurance was the lowest in the disadvantaged integrated co-ethnic neighborhoods (53%; p<0.001).

Table 5. Weighted bivariate associations between sociodemographic characteristics of MENA (18+) in California by ethnic neighborhood type (N= 22,165)

	Non-co-ethnic neighborhood	Disadvantaged immigrant co-ethnic neighborhood	Disadvantaged integrated co-ethnic neighborhood	Advantaged immigrant co-ethnic neighborhood	Advantaged integrated co-ethnic neighborhood	p-value
Type of ethnic neighborhood	33.8	22.3	7.7	17.3	19.0	
Age						
18-24	11.5	7.1	13.0	7.5	8.7	***
25-34	18.2	14.8	24.2	15.6	13.6	
35-44	18.2	16.0	16.9	17.6	15.9	
45-59	25.8	34.9	22.7	26.4	28.4	
60+	26.3	27.2	23.2	33.0	33.4	
Female	46.1	50.8	50.7	49.0	49.3	***
Relationship status						
Never married	26.0	25.4	30.6	24.6	24.6	***
Married	58.8	54.6	55.1	57.8	59.6	
Previously married	15.2	17.7	14.4	17.7	16.7	
Large household size (≥5)	21.8	11.8	26.5	12.6	15.4	***
Country of origin						
Iran	29.3	62.3	18.7	54.6	54.6	
Iraq	6.7	3.3	54.4	2.9	3.4	***
Israel/Palestine	5.9	6.6	1.2	10.7	8.7	
Lebanon	7.9	8.1	3.3	5.3	8.8	
Syria	7.1	6.6	6.3	4.0	4.8	
Egypt	13.2	4.6	1.4	5.9	7.5	
Other	30.0	8.6	14.7	16.7	12.2	
Citizenship status						

US-born citizen	14.2	8.2	9.1	10.8	13.7	***
Naturalized citizen	59.8	68.1	61.3	67.7	68.0	
Non-citizen	26.0	23.7	29.6	21.5	18.3	
Lived in U.S $\geq$ 15 years[b]	61.7	59.4	39.8	65.6	70.2	***
Speaks English well or only English	87.7	75.0	76.3	86.2	88.7	***
Linguistically isolated	13.4	28.0	28.1	14.0	12.4	***
Socioeconomic status						
Live at 0-99% FPL	16.4	16.8	25.4	10.4	10.9	***
Household income						***
Low income (< $90,000)	49.2	58.2	74.1	43.8	41.0	
Middle income ($90,000-$149,999)	20.4	21.5	13.5	18.9	19.4	
High income ($\geq$ $150,000)	30.5	20.4	12.4	37.4	39.6	
College educated[c]	50.8	37.7	28.7	56.1	60.7	***
Home ownership	55.1	39.1	32.5	54.7	62.1	***
Has health insurance	93.9	93.3	91.7	94.5	94.5	0.1637
Has private health insurance[d]	65.5	53.6	43.5	70.5	71.6	***

Notes: a. Previously married includes widowed, divorced, or separated; b. $N_{immigrant}$=20,480; c. $N_{\geq 25\ years}$=20,163; d. $N_{insured}$=21,089 e. The results are weighted to population estimates.

Table 6. Weighted bivariate associations between sociodemographic characteristics of South Asian (18+) in California by ethnic neighborhood type (N= 30,563)

	Non-co-ethnic neighborhood	Disadvantaged immigrant co-ethnic neighborhood	Disadvantaged integrated co-ethnic neighborhood	Advantaged immigrant co-ethnic neighborhood	Advantaged integrated co-ethnic neighborhood	p-value
Type of ethnic neighborhood	21.0	10.0	8.3	42.0	18.6	
Age						***
18-24	10.2	8.3	12.7	6.7	7.8	
25-34	23.4	33.9	27.4	29.7	21.3	
35-44	20.5	22.7	19.0	28.9	28.6	
45-59	23.2	18.5	21.8	20.5	23.5	
60+	22.8	16.7	19.1	14.2	18.7	
Female	47.6	47.8	48.7	47.5	48.9	0.607
Relationship status						
Never married	24.0	25.2	18.7	19.5	16.0	***
Married	65.9	66.2	72.2	74.9	75.4	
Previously married	10.1	8.7	9.1	5.6	8.6	
Large household size (≥ 5)	24.8	22.7	43.4	16.0	27.0	***
Country of origin						
Afghanistan	7.1	7.9	11.4	2.7	8.9	***
Bangladesh	5.6	3.7	1.8	1.1	1.3	
Burma	5.3	4.0	1.6	4.8	1.9	
India	64.9	70.2	66.1	83.6	76.2	
Pakistan	11.5	8.4	16.8	5.0	9.0	
Other	5.7	5.8	2.3	2.9	2.8	
Citizenship Status						
US-born citizen	8.0	5.4	8.2	5.1	7.0	***
Naturalized citizen	56.1	45.0	53.4	44.7	53.3	

Non-citizen	35.9	49.7	38.4	50.2	39.8	
Lived in U.S > 15 years[b]	55.0	42.0	43.7	43.3	53.2	***
Speaks English well or only English	87.7	89.5	74.9	94.3	90.5	***
Linguistically isolated	12.1	10.5	20.6	5.9	8.2	***
Socioeconomic status						
Live at 0-99% FPL	14.2	10.3	16.8	4.1	5.6	***
Household income						
Low income (< $90,000)	42.4	33.1	57.2	16.0	25.9	***
Middle income ($90,000-$149,999)	22.3	24.8	19.7	20.5	24.8	
High income ($\geq$ $150,000)	35.4	42.1	23.1	63.5	49.4	
College educated[c]	60.3	66.4	33.9	81.9	69.9	***
Home ownership	59.1	45.0	60.4	54.1	70.7	***
Has health insurance	94.3	95.5	93.5	97.8	95.5	***
Has private health insurance[d]	72.3	77.1	52.9	87.1	80.3	***

Notes: a. Previously married includes widowed, divorced, or separated; b. $N_{immigrant}$=29,050; c. $N_{\geq 25\ years}$=27,979; d. $N_{insured}$=29,509 e. The results are weighted to population estimates.

Discussion

In this study, I examined the resettlement contexts of MENA and South Asian immigrants in California and proposed a theoretically informed typology to organize the types of ethnic neighborhoods which they form. These analyses indicated that MENA and South Asians in California are primarily spread across metropolitan areas of Northern and Southern California, and they have developed significant communities within the central cities of these metropolitan regions and their surrounding suburbs. The data supported the formation of four distinct neighborhood types that represented MENA and South Asian resettlement contexts including the disadvantaged immigrant co-ethnic neighborhoods, disadvantaged integrated co-ethnic neighborhoods, advantaged immigrant co-ethnic neighborhood, and advantaged integrated co-ethnic neighborhood. There were also notable differences in the sociodemographic characteristics of MENA and South Asians in California by their neighborhood context.

Most MENA ethnic neighborhoods in California were in Los Angeles and Orange County and among South Asians, Alameda County and Santa Clara County. Prior literature also identifies these counties as some of the most populous counties for MENA and South Asian immigrants in the U.S. (*ACS 2014 5 Year Estimates*, 2015; Arab American Institute Foundation & Zogby International, 2018; *Echoes of Freedom: South Asian Pioneers in California, 1899-1965*, 2020). The resettlement of South Asians in areas of Northern California was expected since San Francisco has been a common destination among Indian immigrants since the late 1800s and early twentieth century (*Echoes of Freedom: South Asian Pioneers in California, 1899-1965*, 2020). The sizeable MENA populations in neighborhoods of West Los Angeles including Westwood, Woodland Hills, Tarzana, Encino, and Beverly Hills was also expected

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given the history of Iranian resettlement of the area as early as the 1960s and following the 1979 Islamic Revolution (Auyoung, 2010; Etehad, 2019; Montagne, 2006).

There was some evidence of spatialization between MENA and South Asian ethnic neighborhoods as 14% of the neighborhoods in California had high MENA and high South Asian co-ethnic density; these neighborhoods were mainly located in Orange County, Los Angeles, and San Francisco County. Still, most MENA and South Asian ethnic neighborhoods were located in different areas. Despite their shared experiences within the host society, attitudes and norms of their sending nations may influence these resettlement patterns. For example, MENA and South Asians immigrants may arrive in the country with prejudices toward immigrants of different pan-ethnic or national origin (Jablonski, 2012; Pasha-Zaidi et al., 2021). Furthermore, ideas of racism and colorism which are also common within the MENA and South Asian region may translate into preferences to establish communities and neighborhoods that are distinct from one another (Jablonski, 2012; Pasha-Zaidi et al., 2021). For example, migrant economies of the Gulf states of the MENA region are sustained by South Asians laborers who are often treated also regarded as second-class citizens (Anitha & Pearson, 2013). These social hierarchies may be reproduced in the host society and reappear as geographically segregated MENA and South Asian ethnic neighborhoods. Racial hierarchies in the host society may also reinforce colorist ideals in MENA and South Asians communities. On the other hand, ancestral, linguistic, and familial differences may also shape the formation of distinct ethnic neighborhoods. Future research should investigate if ideologies, norms, and prejudices rooted in the sending nation can shape attitudes of MENA and South Asian immigrants in the U.S. and their preferences for where to resettle and whom to integrate with. Researchers should also explore dynamics of race among MENA and South Asians who resettle in the same co-ethnic neighborhoods.

This study also indicated that nearly 80% of South Asians were living in a co-ethnic neighborhood compared to about 65% of MENA. MENA were most concentrated in non-co-ethnic neighborhoods (34%) and disadvantaged immigrant co-ethnic neighborhoods (22%) whereas South Asians were mostly lived in advantaged immigrant co-ethnic neighborhoods. These differences in the population distribution of MENA and South Asians across each co-ethnic neighborhood may relate to differences in how these groups racially assimilate and their migration histories. MENA, who have historically been classified as racially "White" may be able to racially integrate into predominantly White neighborhoods (Lipsitz, 2011; Aschalek, 2022). The large presence of MENA Americans in non-co-ethnic neighborhoods may also be a consequence of refugee resettlement efforts of the past few decades. From 2002 to 2018, 40% of refugee arrival in the U.S. came from Iraq, Somalia, Iran, Sudan, and Syria (*Refugee Resettlement in U.S. Cities*, n.d.). Due to the limited capacities of gateway cities that were formerly the epicenters of migration, the federal government and resettlement agencies increased refugee resettlement in mid-size and small cities that are less accustomed to integrating newcomers (*Where Are Refugees Being Resettled*, n.d.; *Why Small Cities*, n.d.).

South Asian Americans, overall, had better socioeconomic circumstances than MENA Americans and nearly half lived in an advantaged immigrant neighborhood. It is possible that since many South Asians, particularly Indian Americans, have arrived on merit-based visas, they may have better opportunities to settle down in affluent neighborhood contexts which provide them with socioeconomic resources, strong social networks, and institutions for education and health (Ruiz, 2017). This is similar to the patterns of resettlement among recent East Asian immigrants, particularly Chinese immigrants throughout California and Korean immigrants in Southern California (Walton, 2012). Still, there is a sizeable third wave of South Asian

immigrants who entered the U.S. during the 1980s who were less educated and refugees (US Department of State, n.d.; Baugh, 2020), and make up the South Asian a large proportion of residents in Fresno City and Sacramento, which based on the typology developed in this study, were disadvantaged integrated neighborhood (Bhattacharya & Schoppelrey, 2004; Sandhu & Madathil, 2008; Verma, 2008).

Finally, there were sociodemographic differences within the MENA and South Asian populations by the type of ethnic neighborhood in which they lived. Specifically, there were notable differences in their timing of migration, relational and household characteristics, and socioeconomic status. This is similar to the differences observed in the inner-city Chinatown of Los Angeles compared to suburban ethnic communities of San Gabriel Valley, where the Chinese immigrant population differs by age, socioeconomic status, and time in the U.S. (Li, 1998; Wei, 1998). South Asians who lived in the disadvantaged integrated co-ethnic neighborhoods were the most distinct from South Asians in other ethnic neighborhoods; they had the highest prevalence of large households, linguistic isolation, and low-income households. In contrast, the advantaged immigrant and integrated ethnic neighborhood and more socioeconomically advantaged South Asian residents, which is similar to trends among East Asians who live in ethnoburbs (Li, 1998). Sociodemographic differences by ethnic neighborhood type were not as pronounced among MENA Americans. Future studies should continue to examine sociodemographic differences among MENA and South Asian Americans within their neighborhood context and assess if this contributes to other structural level inequities in their social opportunities and health access (Galster et al., 1999; Logan et al., 2002).

This study had some limitations. First, no causal claims can be made from this study. Next, the ACS did not have an explicit measure for MENA and South Asian race/ethnicity and

definitions of who *is* MENA and South Asian American vary in the literature. Grassroots organizations have attempted to address this question by pushing for better representation of MENA and South Asian populations in Census data and other national surveys. Other groups have used decolonial label of "South West Asians and North Africans (SWANA)" to identify immigrants from the MENA region and South Asia based on their collective opposition to "white supremacy, imperialism, heteropatriarchy, and capitalism". In this dissertation, I used indicators of country of birth and parents' country of birth and could only include MENA and South Asians who were first- or second-generation immigrants in this study, which was similar to methods used in prior research (Abuelezam et al., 2018). Another limitation of this study was that it used an arbitrary spatial boundary (PUMA) and the unit of measurement for assessing neighborhood effects. Such spatial boundaries for neighborhoods are often "modifiable" (i.e. they can be aggregated to form units of different sizes or spatial arrangements at any point in time that lead to different results) (Openshaw, 1984). The study also only offered a snapshot of community characteristics from a single time-point, or the average community profile over five years, and did not account for short term changes in community context.

Conclusion

This study suggests an ethnic neighborhood typology as a way of understanding MENA and South Asian resettlement contexts in the U.S. and the hyperdiversity within these two pan-ethnic communities. The development of this typology is a crucial step away from treating MENA and South Asian Americans as a monolith in terms of their social contexts, lived experiences, and even social well-being and health. The study also demonstrated ways that MENA and South Asian migration challenges early notions of the classical assimilation theory in which immigrants only aimed to converge with the White, middle-class population. Instead,

MENA and South Asian immigrant demonstrate that by living in co-ethnic neighborhood, they can still be socioeconomically thriving and socially well-connected. The different social and economic patterns observed within MENA and South Asian ethnic neighborhoods also demonstrated heterogeneity within and between these pan-ethnic immigrant communities (Kraftl et al., 2019; Miyares, 2004; Tasan-Kok et al., 2014; Zhou & DiRago, 2023; Zhou & Yang, 2022). Future research should continue to explore notions of hyperdiversity and spatialization among MENA and South Asians and the implications of diverse MENA and South Asian neighborhood contexts on social and economic mobility and health access within the U.S..

Chapter 7: Does neighborhood matter? Using an ethnic neighborhood typology to assess health access among Middle Eastern North African and South Asian American adults in California

Aim 2

Introduction

Two pan-ethnic immigrant groups that have grown since the 1965 Immigration and Nationality Act (i.e. repealed national-origin immigration quotas which were established in 1924), are Middle Eastern North Africans (MENA) and South Asians (Bhandari, 2022; Harjanto & Batalova, 2022). MENA and South Asians make up approximately 5% of the U.S. population (Arab American Institute Foundation, 2018; US Census Bureau, 2017; South Asian Americans Leading Together (SAALT), 2019) and they have also established prominent ethnic networks across North America in the past few decades. Still, MENA and South Asians are two perplexing pan-ethnic immigrant communities; these groups are vastly diverse, but they also share similar migration trajectories, at times cultural and religious values and community centers, are affected by similar stereotypes and prejudices, including the "model minority" myth and Islamophobia (i.e. the "unfounded hostility towards Islam and a fear or dislike of all or most Muslims"

(Runnymede, 1997)). The "immigrant selection hypothesis" has previously suggested that immigrants tend to exhibit better health outcomes compared to native-born (Newbold, 2006) since they are a self-selected segment of the population within their respective countries of origin with better health and social outcomes relative to those who do not migrate (Bostean, 2013; Newbold, 2006). Additionally, the strict points-based immigration system in the U.S. tends to only allow entry to immigrants who are more likely to thrive and benefit upon arrival (Ramraj et al., 2015). Still, challenging migration trajectories and experiences with discrimination and prejudice in their receiving contexts are also expected to impact the health of Muslim, MENA, and South Asian population in the U.S. adversely (Abuelezam et al., 2017; Samari, 2016). For example, studies on MENA and South Asian Americans have reported that experiences including racial bias and discrimination from providers was associated with negative experiences in the healthcare setting (Martin, 2015; Reitmanova & Gustafson, 2008), and the restrictive immigration policies including the 2017 "Muslim Ban" are associated with forgoing care (Samuels et al., 2021) and incidence of preterm birth (Samari et al., 2020). On the other hand, research on MENA and South Asians does not always highlight major health inequities. One reason that studies may show mixed evidence of health disparities within the MENA and South Asian immigrant communities may be due to their diverse neighborhood context. In Chapter 6, I found that MENA and South Asian resettlement contexts in the U.S. vary by multiple factors, including if they live among members of the same ethnic group, social opportunities to engage with immigrants of other ethnic origins, and the level of socioeconomic advantage of the neighborhood. In this chapter, I explored if within group differences in health access may be associated with differences in ethnic neighborhood contexts among MENA and South Asian adults (18+) in California.

Background

MENA and South Asian immigrants and their children are at risk of adverse health
outcomes and barriers to health access. Studies indicate that MENA Americans are at risk of
tobacco and nicotine dependence (Al-Omari & Scheibmeir, 2009), low physical activity and
diabetes (Aqtash & Van Servellen, 2013; Kahan, 2007, 2011), mental health disorders
(Abdulrahim et al., 2012; W. Abu-Ras & Abu-Bader, 2008; Aloud & Rathur, 2009; Amer &
Hovey, 2012; Awad, 2010; Ellis, Lincoln, et al., 2010; Ellis, MacDonald, et al., 2010; Goforth et
al., 2014; Jaber et al., 2003; Jamil et al., 2002; Martin, 2015; A. E. Norris et al., 2011; Padela &
Heisler, 2010; E. M. Taylor et al., 2014), intimate partner violence (IPV) victimization and
response (Abu-Ras, 2003; Barkho et al., 2011; Khan et al., 2021), vaccine hesitancy (Dallo &
Kindratt, 2015), and poor obstetric and prenatal care (El-Sayed & Galea, 2010; Hyder & Barnett,
2021; Johnson-Agbakwu et al., 2014; Samari et al., 2020). Various factors have been attributed
to these health risks among MENA Americans. For example, among MENA Americans with
diabetes, language barriers, negligence, lack of awareness, dislike of physicians and/or
medications, transportation, and lack of health insurance have been associated with lack of
diabetes treatment and poor management (Bertran et al., 2015). Acculturation has been positively
associated with tobacco dependence, and youth physical activity overall among MENA (Kahan,
2007), but negatively correlated with nicotine dependence (Al-Omari & Scheibmeir, 2009) and
being overweight and low physical activity among girls (Kahan, 2007). IPV victimization and
response in the MENA American community has been attributed to several factors including
community norms, fear and shame, lack of knowledge of existing resources, language barriers
between services and providers, and lack of informal support (Abu-Ras, 2003; Khan et al.,
2021). Furthermore, MENA women have reported that the fear of promoting negative

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stereotypes about MENA Americans and amplifying Islamophobia discourages from disclosing or seeking support services (Khan et al., 2021).

Cultural norms (Abu-Ras & Abu-Bader, 2008; Awad, 2010; Ellis, Lincoln, et al., 2010) and lack of culturally competent mental health services are also barriers to counseling and psychotherapy among MENA Americans (Abu-Ras & Abu-Bader, 2008). Studies, including the Detroit Arab American Study (DAAS; N=1,016) also reported discrimination (especially that which was related to 9/11) was associated with psychological distress, reduced levels of happiness, and worse health status among several MENA groups including Arab and Chaldean adults in Southeast Michigan (Padela & Heisler, 2010) and mental health service use among MENA immigrants (Abdulrahim et al., 2012; A. E. Norris et al., 2011; Padela & Heisler, 2010). Furthermore, the association between discrimination and psychological distress was stronger among Christian Arabs, those with dark skin color, and residents of non-ethnic neighborhoods (Abdulrahim et al., 2012). Another study, which used the Demands of Immigration Scale (DI)—a 23-item measure of immigration stressors related to loss, not feeling at home, novelty, occupation, language, and discrimination (Aroian et al., 1998)—found that post-migration stressors were positively and substantively associated with comorbid post-traumatic stress disorder (PTSD) and major depressive disorder (MDD) (A. E. Norris et al., 2011). For MENA Americans, discrimination has also been associated negative experiences in various healthcare settings (Martin, 2015), including the maternity settings (Reitmanova & Gustafson, 2008), and negative birth outcomes (Samari et al., 2020). Furthermore, two studies reported that the 2017 "Muslim Ban" had adverse effects for preterm birth (Samari et al., 2020) and forgoing healthcare (Samuels et al., 2021).

Among South Asians, data on health disparities is even more limited, in part because South Asians are often grouped with the broader Asian race/ethnicity category. In several states including Texas, New Jersey, and Florida (2018 State Factsheet Florida, n.d.; Hanna & Batalova, 2020; Yi, 2020) South Asians make up the largest Asian American sub-group. The few studies that do explore South Asian American health focus on mental health (Masood et al., 2009; Tirodkar et al., 2011), IPV victimization and response (Hurwitz et al., 2006; Raj et al., 2005; Raj & Silverman, 2002, 2003, 2003; Tripathi & Azhar, 2022), and heart disease (Guadamuz et al., 2021; Pursnani & Merchant, 2020; Tirodkar et al., 2011; Worth et al., 2009). Studies on mental health of South Asians include research related to lifetime mood and anxiety disorders, gender differences in risk factors of adverse mental health, such as lack of family support for women and family and cultural conflict and social position among men (Masood et al., 2009). Other studies have reported that acculturative stress, which encompasses a broad scope of experiences including intergenerational conflict and discrimination, is associated with depression among South Asian immigrants and their U.S.-born children (Bhattacharya & Schoppelrey, 2004; Inman et al., 2007; Kaduvettoor-Davidson & Inman, 2013; Rahman & Rollock, 2004; Samuel, 2009). South Asian American IPV survivors are also more likely to report poor physical and mental health outcomes (Hurwitz et al., 2006), reduced sexual autonomy, higher risk for unwanted pregnancy, and increased likelihood of having multiple abortions (Hurwitz et al., 2006; Raj et al., 2005; Raj & Silverman, 2002, 2003, 2003; Tripathi & Azhar, 2022).

Existing literature on MENA and South Asian American health has some major limitations. First, the literature does not have one consistent and cohesive way of defining MENA and South Asian racial or ethnic background. As such, the scope of generalizability of studies that focus on MENA and South Asian American is unclear. Another limitation of existing

literature on MENA and South Asian Americans is that, in most cases, the samples are not randomly selected, and instead, are a self-selected, small convenience sample. Additionally, few studies on MENA and South Asian American health draw meaningful comparisons with the general U.S. population or other racial/ethnic groups, and those that do demonstrate mixed results. For example, three studies indicated better birth outcomes for birth weight, preterm birth and infant mortality among MENA American women in metro Detroit compared to non-Hispanic U.S.-born Whites (El Reda et al., 2007; El-Sayed & Galea, 2009a; Finkton et al., 2013), while one study based out of Ohio indicated significantly higher risk of preterm birth among MENA American women compared to U.S.-born whites (Hyder & Barnett, 2021). The first longitudinal study of U.S.-based South Asians, or th**e** Mediators of Atherosclerosis in South Asians Living in America (MASALA) Study, which examines factors that lead to heart disease and guide prevention and treatment of heart disease, reported that South Asians are at higher risk of type 2 diabetes (Kanaya et al., 2014), and cardiovascular related hospitalization and mortality compared to other racial and ethnic groups (Hughes et al., 1989; Jha et al., 1993; Jose et al., 2014; Klatsky et al., 1994; Palaniappan et al., 2004; Vafaei et al., 2023; Volgman et al., 2018). Finally, studies that attempt to examine the effects of Islamophobia on health-seeking behaviors in Muslim American samples (include but are not exclusively MENA and South Asian American) often report null associations between Islamophobia and health (Padela et al., 2014, 2015). For example, a cross-sectional survey of Muslims in Chicago (n=240) indicated that discrimination was and not associated with obtaining Pap smears (Padela et al., 2014), and negatively linked to obtaining a regular mammogram screening (Padela et al., 2015). However, these studies also indicate that factors such as years of U.S. residency and having a healthcare provider were associated health screenings among Muslim women (Padela et al., 2015).

Most studies that have attempted to compare MENA and South Asian American health outcomes with other racial/ethnic groups are set in some of the most densely populated MENA and South Asian immigrant resettlement contexts, including metro Detroit and the Greater Chicago area (El-Sayed & Galea, 2009; Inhorn, 2016; Padela et al., 2014, 2015). In addition to being densely concentrated in these areas, MENA and South Asian Americans also tend to have higher incomes and live in middle class or affluent neighborhoods as compared to non-MENA or South Asian immigrant populations and even U.S.-born whites in the same area (Logan & Stults, 2011). These studies may be limited in their generalizability for understanding health of MENA and South Asian immigrants in other geographic contexts across the U.S. Understanding health among MENA and South Asian Americans at the population level would require a more intentional account of variations their social or neighborhood context. In the next section, I discuss why the neighborhood that MENA and South Asians live in add another critical dimension for understanding their health and health access.

Neighborhood context

Sociologists describe the neighborhood as a subdivision of urban or rural locations such as cities, villages, and towns that are defined by their physical and psychosocial characteristics (Berk, 2005). These physical and psychosocial characteristics are shaped by the people who live there, their location, existing systems of interaction and engagement, shared identities, and public symbols (Keller, 1968; Schwiran, 1983). These characteristics can shape individuals' access to 'material and infrastructural resources' (Macintyre et al., 2002) , "opportunity structures", and opportunities for building social relationships (Macintyre et al., 2002; Kellekci & Berköz, 2006). For immigrants, the ethnic neighborhood is an important context for their experiences within the new host society.

One type of ethnic neighborhood that has been commonly studied within the sociology literature is the "*ethnic enclave*", which is a geographic area with high ethnic concentration, characteristic cultural identity, and economic activity (Hummon, 1996; Portes & Zhou, 1993; Sanders & Nee, 1992; Wilson & Portes, 1980; Zhou, 2009). Ethnic enclaves were originally studied with respect to the inner city Cuban neighborhoods of Miami, the Mexican immigrant communities of Texas and California (Portes & Bach, 1985; Portes & Jensen, 1992), and Old Chinatowns (Zhou, 2009). These neighborhoods have provided an important context for social engagement and integration, strategic resources, and multidimensional supports (i.e. for finding jobs and housing, and addressing financial and material needs) among their immigrant residents (Nee & Sanders, 2001a, 2001b; Campbell & McLean, 2002). The communities within these ethnic neighborhoods are known for their strong levels of trust, cohesion (Iwamoto & Liu, 2010; Mossakowski & Zhang, 2014; Pettigrew et al., 2011), social capital, and supportive immigrant networks (Nee & Sanders, 2001a, 2001b; Campbell & McLean, 2002). Ethnic neighborhoods are often a preferred resettlement contexts for newly arrived immigrants since they provide them with affordable housing, economic activity, and co-ethnic social and professional networks (Hummon, 1996; Iceland & Scopilliti, 2008; Portes, 1981; Portes & Bach, 1985; Portes & Jensen, 1992; Wilson & Portes, 1980; Zhou, 1992).

More recently, research on Asian Americans demonstrates that Asian ethnic neighborhoods may be quite different from Latinx and Black neighborhoods in respect to their social and institutional resources (Logan & Stults, 2011). Contemporary East Asian neighborhoods are also known for having a heightened presence of affluent and well-educated community members, and high quality neighborhood institutions, including churches, voluntary organizations, and service programs, which improve social relationships and individual well-

being (Browning & Cagney, 2003). These neighborhoods are more commonly known as

"*ethnoburbs*", which are post-suburban neighborhoods that exhibit low exposure to poverty, high

household incomes, and better access to culturally-tailored institutional resources, even when

compared to integrated neighborhoods (Li, 2008; Trinh Vo & Yu Danico, 2004; Wen et al.,

2009; Zhou & Kim, 2006). These neighborhoods provide immigrants a place to live where they

are able to experience upward socioeconomic mobility and high levels of social capital while

maintaining their cultural identity, and decreasing their need to assimilate to the cultural norms

of the host society (Zhou, 2007; Zhou & DiRago, 2023).

The metropolitan areas of California, Michigan, New York, Texas, Illinois, New Jersey,

and Washington, D.C. serve as the most common residential contexts for MENA and South

Asian Americans (Arab American Institute Foundation, 2018; Budiman & Ruiz, 2021; US

Census Bureau, 2017). Southern California alone is home two major ethnic neighborhoods

including "Little Arabia" in Anaheim and "Little India" on Pioneer Boulevard in Artesia (J. C.

Lee, 2006), both of which are known for their plethora of MENA- or South Asian-owned

businesses, restaurants, community organizations, and cultural centers (Shukla, 1999) and

contributions to their local economies (Labossiere, 2004). There are also prominent communities

of MENA and South Asian immigrants in the inner-city Midwestern neighborhoods of metro

Detroit and the Minnesota Twin Cities. For example, Dearborn is a popular ethnic enclave for

MENA Americans of Lebanese, Iraqi, and Yemeni descent (Rignall, 1997) while Hamtramck is

a popular destination among Bangladeshi immigrants (Kershaw, 2001). Similarly, several

thousand Somali immigrants live in the inner-city neighborhood of Cedar-Riverside, which is

located just outside of Minneapolis (Corn & Domansky, 2009; Roble & Rutledge, 2008). These

neighborhoods may be described as similar to the inner city *ethnic enclaves* that are

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characteristic of the Cuban immigrants in Miami and Mexican neighborhoods of Texas and California (Portes & Bach, 1985; Portes & Jensen, 1992). There is also a growing presence of MENA and South Asians in suburban areas across many U.S. and Canadian metropolises ; Qadeer & Kumar, 2006). These suburban immigrant communities are comparable to the East Asian "*ethnoburbs* (Lin, 1998; Walton, 2012) which are known for providing immigrants with high levels of social capital and access to quality social and educational institutions, while also maintaining a strong sense of cultural (Zhou & DiRago, 2023).

Neighborhood context and health

Living in an ethnic neighborhood can influence the health of immigrants in several ways. For example, they provide immigrants a socializing agent for beliefs and knowledge related to illness and health-seeking behavior, they improve immigrant access to social and health services, as well as translation and transportation services, and provide health guidance that complementary to the socioeconomic means and cultural or linguistic needs of the ethnic community (Doherty & Campbell, 1988; Doherty & McCubbin, 1985; Kawachi et al., 1996, 1997; Kawachi & Berkman, 2014; Leclere et al., 1994; C. E. Ross et al., 1990). One study reported that societal context (i.e. their ethnicity, social capital, community participation, and access support networks) impacted healthcare access among Korean, Filipino, and Marshallese immigrants in Hawaii (J. Y. Choi, 2009). Another study of Haitian and Cuban refugees in Florida found that living in a favorable context of reception, which encompassed an area with a co-ethnic community and strong support network made up of kin, people of similar national origin, and supervisors and co-workers of the same ethnic identity, was associated with greater use of local mental health services (Portes et al., 1992). A study on Hispanic immigrants, however, indicated that living within a co-ethnic neighborhood was negatively associated with

having health insurance (Cebula, 2006). While these studies indicate major ways in which the neighborhood can shape immigrant health, they also demonstrate how the effects can vary depending on the immigrant community (Kandula et al., 2009; Mason et al., 2011; Walton, 2009).

Among MENA and South Asian Americans, though there are studies that demonstrate differences in health outcomes for MENA and South Asians living in different geographic contexts (El Reda et al., 2007; El-Sayed & Galea, 2009a; Finkton et al., 2013; Hyder & Barnett, 2021), no studies have examined the effects of MENA and South Asian ethnic neighborhood context on health insurance status. California has one of the most expansive eligibility criteria for health insurance in the U.S. compared to any other state, especially for immigrants (L. Norris, 2023). Still, immigrants, who make up 27% of the state make up half of the uninsured (P. Cha, 2021). Furthermore, state-level data from the California Health Interview Survey (CHIS) indicated that from 2019-2020, just under 5% of South Asians were uninsured, which was lower than other Asian sub-groups including Korean and Japanese Americans, and Black and Latinx Americans (S. A. Charles et al., 2022). In the same year, MENA Americans across the U.S. were less likely to be uninsured than the overall foreign-born population (13% vs. 20%) (Harjanto & Batalova, 2022). Still reports on health insurance status for MENA and South Asian Americans does not capture within-group disparities in health insurance status, nor does it account for differences in MENA and South Asian neighborhood context. In this study, I examined if neighborhood context was a determinant having any health insurance and having private health insurance among those who were insured, among MENA and South Asian Americans aged 18 years and older who lived California. I expected to find disparities in the health insurance status

(both any and private over public health insurance) among MENA and South Asian Americans based on their neighborhood context.

Conceptual Framework

This study integrates the socioecological model (SEM), various theories of assimilation, including the classical assimilation theory (MacDonald & MacDonald, 1964; Zhou, 1992), place stratification theory (C. Z. Charles, 2003), segmented assimilation theory (Portes & Zhou, 1993; Zhou, 1997), spatial assimilation theory (Massey & Denton, 1985; Orum, 2019; T. Wen, 2019), and the resurgent ethnicity perspective (Walton, 2012, 2015; T. Wen, 2019), and concepts of social context to understand how ethnic neighborhoods may affect MENA and South Asian health insurance status.

SEM posits that "health behavior and promotion are interrelated" and occur through the interplay of individual, interpersonal, institutional, community, and policy factors (McLeroy et al., 1988). The integration of contextual factors (i.e., factors that span the community, institutional, and policy level) makes SEM unique from other theories of health behavior in that it explicitly recognizes the role of the social environment on health (McLeroy et al., 1988; Sallis et al., 2015). SEM is a useful tool for identifying, understanding, and describing how factors across multiple levels of the social environment influence health outcomes (Ajayi et al., 2021; Aura et al., 2016; Garney et al., 2021). I used SEM to examine how various dimensions of neighborhood context, including geographic setting and socioeconomic context, contribute to health insurance status.

Next, the place stratification theory asserts that dominant have been able to manipulate space to maintain their physical and social separation from groups that they view as undesirable (C. Z. Charles, 2003; Logan & Molotch, 2007). As result, racial and ethnic minorities may be

unable to resettle in neighborhoods that are socioeconomically advantaged and have better quality resources and institutions (C. Z. Charles, 2003; Logan & Molotch, 2007). Rejection from members of the host society empowers immigrants to resettle in urban centers with members of their own co-ethnic community or kin (Chimbos & Agocs, 1983; Portes & Jensen, 1989) which are built on solidarity for mutual assistance and cultural security (Takaki 1989), a process which has been described by the classical assimilation theory and the chain-migration process (MacDonald & MacDonald, 1964; Zhou, 1992). These areas are better known as ethnic enclaves, which are geographic areas with high ethnic concentration that uphold a strong cultural identity and have flourishing economic activity (Hummon, 1996). In addition to providing economic success, ethnic enclaves offer their residents strong migrant networks and high social capital which they can capitalize on in exchange for tangible resources, such as information on employment opportunities, affordable housing, and government assistance programs (C. Z. Charles, 2003; Logan & Molotch, 2007). Tangible and intangible resources that come out of ethnic enclaves heighten the incentive to stay in these neighborhoods even though they may normally be considered undesirable places to live among dominant members of the host society (Logan & Alba, 1993). Other perspectives on place stratification suggest that the barriers to moving into more advantaged neighborhoods are higher for racial and ethnic minorities compared to members of the majority, which disincentivizes immigrants from moving out (Logan & Alba, 1993).

Next, the segmented assimilation theory and place stratification theory were used to understand another type of inner-city ethnic neighborhood formation. According to the segmented assimilation theory, immigrants whose ethnic communities do provide leverage for social mobility will have children who will ultimately be unable to residentially integrate with

predominantly White, upper-middle class neighborhoods, and will instead integrate into disadvantaged, racially-segregated neighborhoods with U.S.-born co-ethnics and other racialized minorities (Portes & Zhou, 1993; South et al., 2008). Whether these ethnic neighborhoods are formed in response to the discrimination and constraint predicted by place stratification, or by individual and group horizontal or downward mobility as predicted by segmented assimilation, the result is an economically disadvantaged and socially disorganized ethnic context dominated by a "poverty paradigm" and characterized by crime, gangs, dilapidated housing, and failing schools (Morenoff & Lynch, 2004; Williams & Collins, 2016). Prior literature describes such ethnic neighborhoods as communities of constraint and characterizes them as having a high concentration of U.S.-born individuals who are socioeconomically disadvantaged.

The spatial assimilation theory posits that as social status among immigrants increases, they attempt to improve their spatial position by moving into predominantly White, upper-middle class suburban neighborhoods (Massey & Denton, 1985; Orum, 2019; T. Wen, 2019). These suburban ethnic contexts are better known as "ethnoburbs", which are suburban clusters in residential areas where one ethnic group has significant concentration but does not necessarily comprise the majority (Li, 1998; Trinh Vo & Yu Danico, 2004). The tendency of minorities clustering in neighborhoods that are geographically distant from their traditional gateways does only improve their social and economic mobility in the U.S., but has also influenced changing demographic trends in ethno-racial diversity across the country (Fischer & Tienda, 2006; Hall, 2013; Hall et al., 2016; Massey, 2008).

Finally, according to the resurgent ethnicity theory, immigrants and U.S.-born ethnic minorities who already have high socioeconomic status have little to gain from spatial integration with whites and much to gain from living among others of the same ethnicity (Logan

et al., 2002; M. Wen et al., 2009). Therefore, instead of trying to move into integrated neighborhoods, the resurgent ethnicity theory posits that immigrants who have high socioeconomic status prefer to live in less integrated neighborhoods. Such neighborhoods offer immigrants access to high-quality education and access to institutional resources (Zhou, 2007) while maintaining their ability to live in a neighborhood where their cultural identity is preserved (Aguilar-San Juan, 2009). These neighborhoods offers immigrants professional opportunities, well connected social networks, and high social capital, while also decreasing their chances of assimilating with the dominant culture (Zhou, 2007).

Place stratification theory, classical assimilation theory, segmented assimilation theory, spatial assimilation theory, and the resurgent ethnicity perspective were used to develop an ethnic neighborhood typology for MENA and South Asian immigrants based on their social and socioeconomic dimensions. These neighborhoods included the disadvantaged immigrant co-ethnic neighborhood (integrated the classical assimilation theory, place stratification, chain migration), disadvantaged integrated co-ethnic neighborhood (integrated the segmented assimilation theory and place stratification theory), the advantaged immigrant co-ethnic neighborhood (resurgent ethnicity theory), and advantaged integrated co-ethnic neighborhood (spatial assimilation theory). These neighborhoods are representative of the social contexts, or "one' physical and social environment including their 'material and infrastructural resources' and 'collective functioning and practices' (Macintyre et al., 2002), that immigrants encounter in the host society.

For immigrants, the ethnic neighborhood is an essential feature of one's social context which can at times enable or hinder their access to healthcare (Pickett & Wilkinson, 2008). First, when individuals in a neighborhood share a similar cultural background and socioeconomic

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status, it can facilitate cooperation between neighbors, lead to higher levels of trust and cohesion, and foster solidarity among residents (Iwamoto & Liu, 2010; Mossakowski & Zhang, 2014; Pettigrew et al., 2011). The ethnic neighborhood also provides an important context for building social cohesion since it provides immigrants a space for social engagement and integration, strategic resources, multidimensional supports (i.e. for finding jobs and housing), and social capital (Nee & Sanders, 2001a, 2001b; Campbell & McLean, 2002). In turn, immigrant networks play a crucial role in enabling health care access and utilization since they offer immigrants a space to exchange information on beliefs and knowledge related to illness and health-seeking behavior and where to obtain culturally-competent and affordable social and health services (Doherty & Campbell, 1988; Doherty & McCubbin, 1985; Kawachi et al., 1996, 1997; Kawachi & Berkman, 2014; Leclere et al., 1994; C. E. Ross et al., 1990; Walton, 2012).

As the main setting for interpersonal interactions and cultural and community resources (Diez Roux & Mair, 2010; Goto et al., 2002), the ethnic neighborhood can also reduce immigrant exposure to discrimination (Feagin, 2018; Fisher et al., 2000; Portes & Zhou, 1993; Seaton et al., 2018). For example, immigrants who live in an ethnic neighborhood have little reason to leave their neighborhood for work, school, shopping or even health care, eliciting fewer opportunities to encounter racial and ethnic discrimination from members of the dominant racial group (Clough et al., 2013; Pickett & Wilkinson, 2008). Ethnic neighborhoods also provide immigrants access to cultural resources, which may reduce their need to turn to health and social service institutions that are discriminatory or biased (Clough et al., 2013; Gee & Ford, 2011). Alternatively, when immigrants integrate into social contexts that are racially segregated and socially disadvantaged, they may experience greater exposure to discrimination (Massey & Denton, 1988). Previous literature refers to such neighborhoods as "communities of constraint"

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(comparable to the disadvantaged integrated co-ethnic neighborhoods in this study) (Portes & Zhou, 1993; South et al., 2008) since they represent immigrants neighborhoods where socioeconomic resources are constrained (Portes & Zhou, 1993; South et al., 2008). Immigrants who live in these racially segregated and socially disadvantaged neighborhoods may experience downward mobility (Zhou, 1999), have limited healthcare access, and poor physical and mental health outcomes (Forman et al., 1997; Gee et al., 2007; Karlsen et al., 2002). Although this study did not assess typical indicators of social context including social cohesion, social capital, and discrimination, the MENA and South Asian ethnic neighborhood typology provides a strong theoretical justification for the disparate social contexts that could emerge in each type of ethnic neighborhood.

Finally, this study assessed the role of individual factors associated with health insurance status including sociodemographic characteristics such as age, sex (A. E. Cha & Cohen, 2022), race (A. E. Cha & Cohen, 2022), marital status, educational attainment, percent below the federal poverty level, country of origin, citizenship status, and acculturation (Barry et al., 2020; Bunn et al., 2013; Hasstedt et al., 2018c; Ko Chin, 2018; Stimpson & Wilson, 2018).

Figure 1. Conceptual model of MENA and South Asian American neighborhood context and health insurance status

*included in the analysis
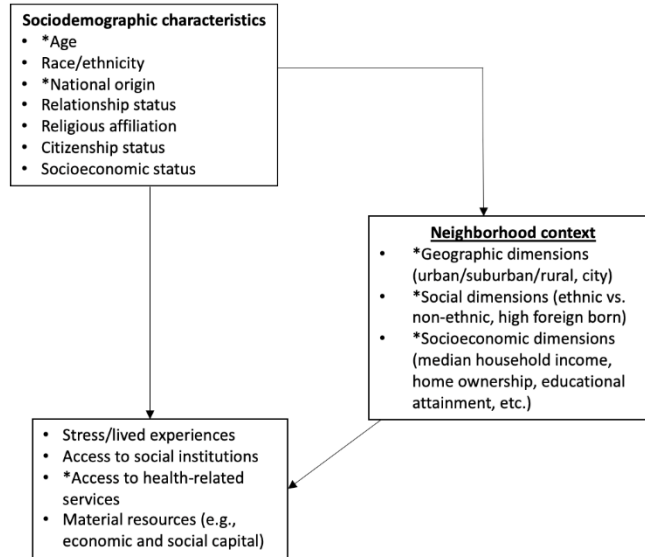
Figure 2. Ethnic neighborhood typology classification for MENA and South Asian Americans[21]

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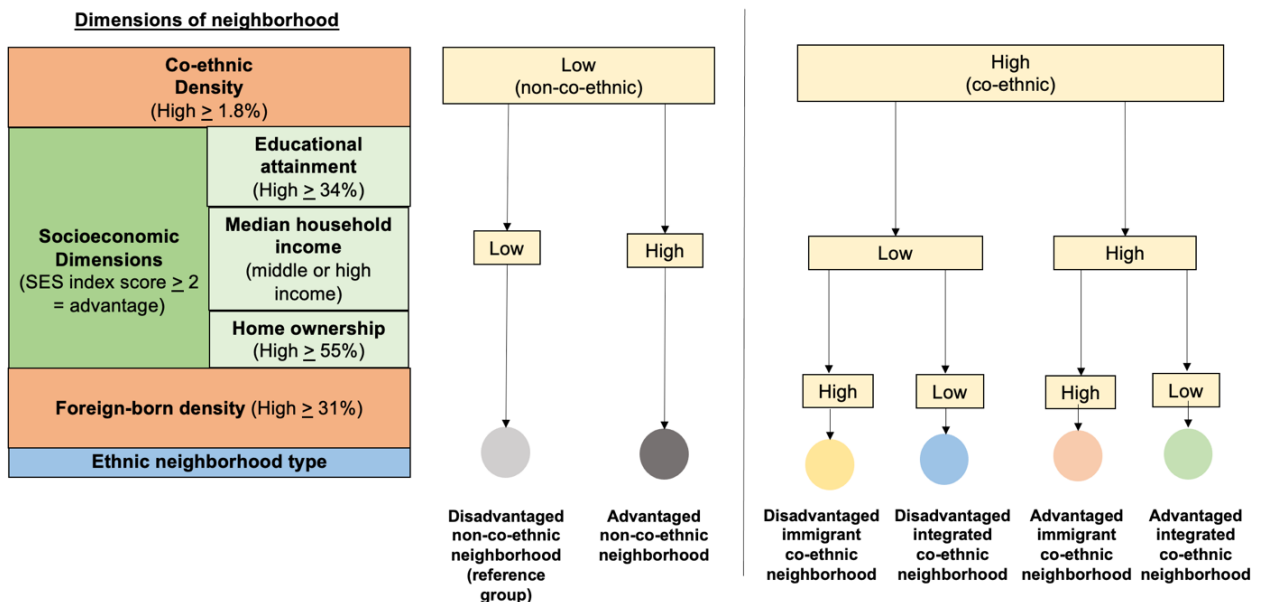
21 The ethnic neighborhood typology in Aim 2 differs from that of Aim 1 because of the multivariate analysis. The only difference is the inclusion of two non-co-ethnic neighboods based on neighborhood level socioeconomic status.

Methods

<u>Data</u>

This study used data from the American Community Survey (ACS), which is a nationwide survey that collects annual data on social, economic, housing, and demographic characteristics of the U.S. population (ACS, 2023). The study used the 2020 ACS 5-year estimates since they offered a large sample and small margins of error (U.S. Census Bureau, 2020). Over 3.5 million households and group quarters[22] were contacted to participate in the ACS from a sampling frame provided by the Census Bureau's official inventory of known living quarters and nonresidential units in the U.S. (Poehler, 2022a). Response rates for household units in California ranged from 94.4% to 69.9% from 2016 to 2020 and 94.6% to 35.3% for group quarters (*Response Rates California*, 2022) (Appendix A). For household units the data were collected by Internet, mail, telephone, and personal visit, and in GQs, by a field representative using the CAPI instrument. Respondents could use a bilingual (Spanish or English) self-report questionnaire if they were unable to complete a CAPI interview (Poehler, 2022c).

<u>Sample</u>

The sample included all respondents over the age of 18 years (N=1,444,781). The analysis of neighborhood effects on health insurance status was only conducted among MENA (N=22,165) and South Asian respondents aged 18 and older (N=30,563). This study defined MENA and South Asian race/ethnicity using measures for place of birth and mother or father's place of birth[23].

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22 Group quarters are where people stay in group living arrangements that are owned or managed by an organization providing housing and/or services for the residents (e.g., college residence halls, skilled nursing facilities, group homes, correctional facilities) (Chapter 8, ACS Design & Methodology, 2014).
23 MENA included those who were born or had at least one parent who was born in a Middle Eastern nation including Bahrain, Iraq, Iran, Israel, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, Syria, the United Arab Emirates, Yemen or North Africa such as in Algeria, Egypt, Libya, Mauritania, Morocco, Somalia,

<u>Measures</u>

Dependent variable. Health insurance status was examined using a measure of the type of health insurance that the respondent had in the past year. Responses included "insurance through a current or former employer or union (of this person or another family member)", "insurance purchased directly from an insurance company (by this person or another family member)", "Medicare (for people 65 and older, or people with certain disabilities)", "Medicaid, Medical assistance, or any kind of government-assistance plan for those with low incomes or a disability", "TRICARE or other military health care", "VA (including those who have ever used or enrolled for VA health care)", "Indian Health Service, or any other type of health insurance or health coverage plan". Responses were recoded into a three-level categorical variable (0=uninsured, 1=public insurance, and 2=private or private and public insurance) and two binary measures of (1) has health insurance (0=uninsured, 1=has health insurance), and among those who did have health insurance 2) has private health insurance (0=has public health insurance, 1=has private health insurance). Private health insurances included those provided through an employer or union, purchased by an individual from a private company, and TRICARE or other military health care and public health insurance included Medicare, Medicaid, Medical Assistance, or any kind of government assistance plan for those with low incomes or a disability, and the VA (Turner et al., 2009). Type of health insurance was categorized based on Census Bureau definitions (Turner et al., 2009).

Independent variables. ACS included a measure of race which was recoded into nine categories within the public use microdata including "white", "Black/African American", "American Indian/Alaska native", "Chinese", "Japanese", "Other Asian or Pacific islander",

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Sudan, Tunisia. South Asians included those who were born or had at least one parent born in a South Asian nation including Afghanistan, Bangladesh, Bhutan, India, Myanmar (Burma) Nepal, Pakistan, Sri Lanka (Ceylon).

"Other race", "two major races", "three or more major races" and a separate measure to identify "Hispanic". Based on their place of birth or their parents' place of birth, MENA and South Asians were identified and excluded from these preexisting race/ethnicity categories. A new seven category variable of race/ethnicity with the following categories was created: "MENA", "South Asian", "White", "Black", "Latinx" (included anyone who identified ethnicity as Hispanic regardless of their self-reported race), "Asian", and "Other" (included those who identified as "Other race", "two major races", "three or more major races" and were not of MENA or South Asian origin).

Neighborhood. Neighborhood was defined as a public use microdata area (PUMA). PUMAs are statistical geographic areas with non-overlapping boundaries that have a minimum population of 100,000 (*Public Use Microdata Areas (PUMAs)*, 2022). PUMAs were the smallest geographic area unit available through the ACS public use microdata. Based on the 2010 Census spatial boundary data, California has 265 PUMAs.

Next, I selected geographic, social, and socioeconomic dimensions available in ACS to evaluate neighborhood context. Past studies which explore the effects of ethnic neighborhood on health have operationalized the neighborhood using measures of co-ethnic density (percentage of the same racial/ethnic group within a certain region) (Cebula, 2006; Portes & Zhou, 1992), foreign-born density (the concentration of foreign-born individuals within a certain region) (J. Y. Choi, 2009), and the features of the urban environment including abandoned housing, public deviance, high crime rates, high poverty, high unemployment, low education, and low income (Macintyre et al., 2002; Veenstra et al., 2005; Wight et al., 2008). In this study geographic dimensions in the neighborhood were assessed as their geographic county classification (i.e. urban, suburban, rural). Social dimensions of the neighborhood were evaluated through their co-

ethnic and foreign-born density and socioeconomic dimensions of the neighborhood were assessed using measures of educational attainment, household income, and home ownership. Details of how these measures were developed are detailed in the previous chapter. Table 1 includes definitions for each measure which was created to assess social and economic dimensions of the neighborhood and the ethnic neighborhood typology.

The final typology for MENA and South Asian ethnic neighborhoods included six neighborhood types which were organized based on their socioeconomic status (advantaged vs. disadvantaged), foreign born density (integrated vs. immigrant) and co-ethnic density (non-co-ethnic vs. co-ethnic). Neighborhoods in this study included two non-co-ethnic neighborhoods and four co-ethnic neighborhoods (0=disadvantaged non-co-ethnic neighborhood (reference), 1=advantaged non-co-ethnic neighborhood, 3=disadvantaged integrated co-ethnic neighborhood, 4=disadvantaged immigrant co-ethnic neighborhood, 5=advantaged immigrant co-ethnic neighborhood, 6=advantaged integrated co-ethnic neighborhood) (See Figure 2).

Control variables. The analysis controlled for sociodemographic characteristics that are associated with health insurance status including age (0=18-24 years, 1=25-34 years, 2=35-44 years, 3=45-59 years, 4=60 years or older) (S. A. Charles et al., 2022), sex (0=male, 1=female), nativity (0=foreign-born, 2=U.S. born), marital status (0=never married, 1=married, 2=previously married (includes widowed, divorced, separated), and household size (0= < 5, 1= $\geq$ 5), citizenship status (0=U.S.-born citizen, 1=naturalized citizen, 2=non-citizen), country of origin (MENA: 0=Iran, 1=Iraq, 2=Israel/Palestine, 3=Lebanon, 4=Syria, 5=Egypt, 6=other MENA nation; South Asian: 0=Afghanistan, 1=Bangladesh, 2=Burma, 3=India, 4=Pakistan, 5=other South Asian nation), years in the U.S. (0 = < 15 years, 1= $\geq$ 15), English proficiency (0=does not Speak English or does not speak English well, 1=speaks English well or only speaks

English), and linguistic isolation (0=no or not applicable, 1=yes), educational attainment (0=high school/GED or less, 1=some college or Associate's degree, 2=Bachelor's degree, 3=Graduate degree (M.S., M.A., professional degree, or doctorate), total annual household income (0=low (< $90,000), 1=middle ($90,000-$149,999), 2=high (≥ $150,000)), and percent below the federal poverty level (FPL) (0= 0-99%, 1=100-199%, 2=200-299%, 3=300-399%, 4=400%+) (Barry et al., 2020; Bunn et al., 2013; Hasstedt et al., 2018c; Ko Chin, 2018; Stimpson & Wilson, 2018).

Analysis

Sociodemographic characteristics of the MENA and South Asians in California are reported in Table 2. Next, I assessed how the socioeconomic dimensions of the neighborhood were associated with health insurance status (any and private vs. public) using Pearson chi-square tests (Table 3). Then, I conducted adjusted binomial logistic regressions that examined how MENA and South Asian race/ethnicity was associated with health insurance status (Table 4). Finally, I estimated adjusted binomial logistic regressions that examined how neighborhood-level characteristics were associated with health insurance status (Table 5). Wald Tests were used to examine if neighborhood-level characteristics were better predictors of health insurance status compared to individual covariates alone, or neighborhood level characteristics individually or as an organized neighborhood typology.

Table 1. Definitions for neighborhood-level measures

Variable	Definition	Categories
Individual-level characteristics		
MENA or South Asian race/ethnicity	<u>MENA:</u> born in Bahrain, Iraq, Iran, Israel, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, Syria, the United Arab Emirates, Yemen; North Africa: Algeria, Egypt, Libya, Mauritania, Morocco, Somalia, Sudan, Tunisia or U.S.-born with at least one parent born in one of the aforementioned countries; <u>South Asian:</u> born in Afghanistan, Bangladesh, Bhutan, India, Myanmar (Burma) Nepal, Pakistan, Sri Lanka (Ceylon) or U.S.-born with at least one parent born in one of the aforementioned countries.	4. MENA 5. South Asian 6. Not MENA or South Asian
Nativity	Anyone born outside of one of the fifty U.S. states or in a U.S. territory was considered foreign-born.	3. U.S.-born 4. Foreign-born
Annual household income	Sum of all annual household incomes among those present in a household who were ≥ 15 years.	4. Low (< $90,000) 5. Middle ($90,000-$149,999) 6. High (≥ $150,000)
Educational attainment	Highest grade of school (household member) completed, or the highest degree (household member) has received for individuals ≥ 25 years.	3. Completed a college degree 4. Did not complete at least a college degree
Home ownership	Three-category measure of home ownership, which included the responses "not applicable", "owned or being bought (loan)", and "rented". Those who said "owned or being bought (loan)" were considered homeowners	3. Not a homeowner 4. Homeowner
Neighborhood-level characteristics		
Neighborhood	a public use microdata area (N=265)	

Geographic dimensions
  Urban-suburban-rural
  classification
	Indicated whether the household resided within an urban, suburban, or rural county	4. Urban
		5. Suburban
		6. Rural

Social dimensions Co-ethnic density	Proportion of MENA or South Asians in a neighborhood (High $\geq$ 1.8%)	5. Low MENA and South Asian co-ethnic density 6. High MENA co-ethnic density only 7. High South Asian co-ethnic density only 8. High MENA *and* South Asian co-ethnic density
Ethnic neighborhood	Proportion of MENA or South Asians in a neighborhood $\geq$ 1.8% (mutually exclusive of each other)	4. MENA ethnic neighborhood 5. South Asian ethnic neighborhood 6. Not a MENA or South Asian ethnic neighborhood
Foreign born density	Percentage of foreign born residents in a neighborhood.	3. Integrated (< 31% foreign-born 4. Immigrant ($\geq$ 31% foreign-born)
Socioeconomic dimensions Median annual household income	Median annual household income in a neighborhood.	4. Low (< $90,000) 5. Middle ($90,000-$149,999) 6. High ($\geq$ $150,000)
Percent college graduates	Percentage of adults $\geq$ 25 years who have completed a bachelor's degree within a neighborhood.	3. High ($\geq$ 33% graduated college) 4. Low (< 33% graduated college)
Percent home ownership	Percentage of homeowners in a neighborhood.	3. High: $\geq$ 55% are homeowners 4. Low: < 55% are not homeowners
Socioeconomic status index	Composite score for neighborhood-level socioeconomic status that uses the three socioeconomic status indicators. Each indicator of neighborhood-level socioeconomic status that	3. High: $\geq$ 2 neighborhood-level socioeconomic status score 4. Low: < 2 neighborhood-level socioeconomic status score

	met the threshold of "high" was assigned a score of 1 (e.g. middle or high neighborhood median household income ($\geq$ \$90,000), high neighborhood percent college education ($\geq$34%), or high percent neighborhood home ownership ($\geq$ 55%)).	
Ethnic neighborhood type	Ethnic neighborhood type based on social and socioeconomic dimensions of the neighborhood.	6. Non-co-ethnic neighborhood (Neighborhood has < 1.8% MENA or South Asian co-ethnic density) 7. Disadvantaged immigrant neighborhood ($\geq$ 1.8% MENA or South Asian co-ethnic density, immigrant neighborhood, and low socioeconomic status) 8. Disadvantaged integrated neighborhood ($\geq$ 1.8% MENA or South Asian co-ethnic density, integrated neighborhood, and low socioeconomic status) 9. Advantaged immigrant neighborhood ($\geq$ 1.8% MENA or South Asian co-ethnic density, immigrant neighborhood, and high socioeconomic status) 10. Advantaged integrated neighborhood ($\geq$ 1.8% MENA or South Asian co-ethnic density, integrated neighborhood, and high socioeconomic status)

Analysis

First, I reported sociodemographic characteristics of the MENA and South Asians in

California (Table 2). Next, I assessed how the socioeconomic dimensions of the neighborhood

were associated with health insurance status (any health insurance and private vs. public health

insurance) using Pearson chi-square tests (Table 3). Then, I conducted adjusted binomial logistic regressions of MENA and South Asian race/ethnicity and having health insurance status (any health insurance and private vs. public health insurance; Table 4). Finally, I estimated adjusted binomial logistic regressions on neighborhood-level characteristics on having any health insurance (Table 5) and among those who had health insurance, having private health insurance among MENA and South Asians (Table 6). Wald Tests were used to examine if the ethnic neighborhood typology was a better predictor of health insurance status then individual covariates alone and each neighborhood-level characteristic individually.

Results

<u>Sample characteristics</u>

MENA. Among MENA Americans, 26% were ages 18-34, 25.5% were 35-49, 27% were 50-64, and 22% were 65 or older. Approximately 92% were foreign-born and 24% were non-citizens. Most MENA in California were from Iran (45%), followed by Egypt (8%), Iraq (8%), Israel/Palestine (7%), Lebanon (7%), and Syria (6%). Most MENA (84%) spoke English well and 18% were linguistically isolated. Nearly half (45%) of MENA who were 25 years and older were college educated, 30% had an annual household income of $150,000 or more, 15% lived below the FPL, and 6% were uninsured (Table 2).

South Asians. Approximately 35% of the South Asian population was ages 18-34, 35% as 35-49, 18% were 50-64, and 13% were 65 and older. Only 5% of South Asians were U.S.-born and 44% were non-citizens. Most South Asians in California were from India (75%), Pakistan (8%), and Afghanistan (6%). Approximately 90% spoke English well and 9% were linguistically isolated. Approximately 66% of South Asians 25 years and older were college educated, 50%

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had an annual household income of $150,000 or more, 8% lived below the FPL, and 4% were

uninsured (Table 2).

Table 2. Characteristics of MENA and South Asians in California (N=57,728)

| | MENA | South Asian | |
| | N = 22,165 | N = 30,563 | p-value |
	Weighted %	Weighted %	
Age			
18-24	9.4	8.3	***
25-34	16.6	27.1	
35-44	17.1	25.6	
45-59	26.5	21.5	
60+	30.5	17.5	
Sex			
Male	51.4	52.1	0.635
Female	48.6	47.9	
Nativity			
Foreign-born	92.1	95.0	***
U.S.-born	7.9	5.0	
Marital status			
Never married	25.5	20.3	***
Married	57.6	72.0	
Previously married	16.9	7.7	
Household size ≥ 5	17.1	22.9	***
Citizenship			
U.S.-born citizen	11.8	6.3	***
Naturalized citizen	64.7	49.5	
Non-citizen	23.6	44.2	
MENA country of origin			
Iran	45.0		
Iraq	8.3		
Palestine/Israel	7.1		
Lebanon	7.3		
Syria	5.9		
Egypt	8.0		
Other MENA nation	18.4		
South Asian country of origin			
Afghanistan		6.0	

Bangladesh		2.4	
Burma		4.0	
India		75.5	
Pakistan		8.4	
Other		3.7	
Lived in the U.S. $\geq$ 15 years[a]	42.2	57.5	***
Speaks English well	83.9	90.1	***
Linguistically isolated	17.7	9.3	***
County classification			
Urban	92.3	91.0	***
Suburban	6.6	6.7	
Rural	1.1	2.3	
Lives in a city	35.7	16.6	***
Educational attainment[b]			
$\leq$ High school	30.1	20.0	***
Some college	24.2	13.6	
Bachelor's degree	26.2	30.2	
Graduate degree	19.6	36.2	
Annual household income			
Low income (< \$90,000)	50.6	28.5	***
Middle income (\$90,000-\$149,999)	19.6	22.1	
High income ($\geq$ \$150,000)	29.8	49.4	
% Federal poverty level (FPL)			
0-99%	15.3	8.2	***
100-199%	15.2	9.0	
200-299%	12.3	9.4	
300-399%	9.9	8.5	
$\geq$ 400%	47.2	64.9	
Health insurance status			
Uninsured	6.2	3.9	***
Public health insurance	34.5	20.2	
Private health insurance[c]	59.3	75.9	

Notes: a. MENA $N_{immigrant}$=20,480, South Asian $N_{immigrant}$=29,050; b. $N_{MENA \geq 25 years}$ =20,163; $N_{South Asian \geq 25 years}$ = 27,979; c. Includes those with public *and* private health insurance. d. Results are representative to population estimates e. *p<0.05, **p<0.01, ***p<0.001.

Table 3. Weighted bivariate associations of health insurance status of MENA and South Asians (18+) in California by social and socioeconomic dimensions of the neighborhood

	Any health insurance				Private health insurance			
	MENA		South Asian		MENA		South Asian	
	N = 22,165		N = 30,563		N = 21,089		N = 29,509	
	%	p	%	p	%	p	%	p
Neighborhood-level characteristics								
Geographic classification								
Urban	93.7	0.352	96.2	0.317	63.0	0.1377	80.6	***
Suburban	95.4		95.2		65.4		65.7	
Rural	94.1		93.2		71.4		54.4	
City								
Yes	93.6	0.618	96.5	0.185	60.5	0.0035	84.8	***
No	93.9		95.9		64.9		77.0	
Co-ethnic density								
Low	93.9	0.870	94.3	***	65.5	0.0065	74.7	***
High	93.8		96.5		62.1		85.1	
Foreign born density								
Integrated (low)	93.8	0.950	94.7	***	64.8	0.0038	72.7	***
Immigrant (high)	93.8		97.0		61.7		83.4	
Percent college educated								
Low	93.3	**	94.9	***	58.7	***	71.7	***
High	95.0		97.9		73.1		89.5	
Median annual household income								
Low	92.6	**	93.4	***	51.0	***	59.8	***
Middle or high	94.5		96.8		70.5		84.0	
Percent home ownership								
Low	93.2	0.122	95.5	0.051	57.9	***	77.8	*

High	94.5		96.4		69.2		79.7	
Socioeconomic status index							
Low	92.7	**	93.9	***	53.9	***	66.4	***
High	94.8		97.0		71.6		84.4	
Neighborhood classification							
Disadvantaged non-co-ethnic	92.5	*	93.0	***	58.7	***	66.6	***
Disadvantaged immigrant co-ethnic	93.3		95.5		53.6		77.1	
Disadvantaged integrated co-ethnic	91.7		93.5		43.5		52.9	
Advantaged non-co-ethnic	95.4		96.2		72.9		80.1	
Advantaged immigrant co-ethnic	94.5		97.8		70.5		87.1	
Advantaged integrated co-ethnic	94.5		95.5		71.6		80.3	

Notes: a. Results are weighted to population estimates; b. *** p<0.001, ** p<0.01, * p<0.05.

Any health insurance

MENA. Having any health insurance was associated with neighborhood-level percent college educated, median annual household income, and the socioeconomic status index (p<0.01). Additionally, MENA who lived in disadvantaged integrated co-ethnic neighborhoods had the lowest prevalence of any health insurance and MENA who lived in advantaged non-co-ethnic neighborhoods had the highest prevalence of having any health insurance (p<0.05).

South Asians. Neighborhood-level co-ethnic density, foreign-born density, percent college educated, median annual household income, and the socioeconomic status index were significantly associated with having any health insurance (p<0.001). South Asians living in the disadvantaged non-co-ethnic neighborhoods had the lowest prevalence of any health insurance and South Asians in advantaged immigrant co-ethnic neighborhoods had the highest prevalence of having any health insurance (p<0.001).

Private health insurance.

MENA. Among those who had insurance, private health insurance was associated with living in a city, and neighborhood-level co-ethnic density, foreign-born density (p<0.01), percent college educated, median annual household income, home ownership, and the socioeconomic status index (p<0.001). Additionally, MENA who lived in disadvantaged integrated co-ethnic neighborhoods had the lowest prevalence of having private health insurance and MENA who lived in advantaged non-co-ethnic neighborhoods had the highest prevalence of having any health insurance (p<0.001).

South Asians. Geographic classification, city residence, and neighborhood-level co-ethnic density, foreign-born density, percent college educated, median annual household income

(p<0.001), percent home ownership (p<0.05), the socioeconomic status index (p<0.001) were

significantly associated with having private health insurance (p<0.001). South Asians living in

the disadvantaged integrated neighborhoods had the lowest prevalence of having private health

insurance and South Asians in advantaged immigrant co-ethnic neighborhoods had the highest

prevalence of having private health insurance (p<0.001).

Multivariate findings

Health insurance status by race/ethnicity

        Compared to Whites, MENA, South Asians, and other Asians in California had

significantly higher odds of having health insurance (Table 3, Model 1; aOR_{MENA}: 1.2; p<0.05;

$aOR_{South\ Asian}$: 1.9; aOR_{Asian}: 1.3 p<0.001) and Black, Latinx, and other races had lower odds of

having health insurance (OR_{Black}: 0.8; p<0.001; aOR_{Latinx}: 0.7; aOR_{Other}: 0.8 p<0.001). MENA,

South Asians, other Asians, Black, Latinx, and Other races in California all had significantly

lower odds of having private health insurance compared to Whites (Table 3, Model 2; aOR_{MENA}:

0.5, $aOR_{South\ Asian}$: 0.6, aOR_{Black}: 0.6, aOR_{Latinx}: 0.6, aOR_{Asian}: 0.9, p<0.001; OR_{Other}: 0.9,

p<0.001).

Table 4. Weighted binomial logistic regression on health insurance status by race/ethnicity of
adults (18+) respondents of the 2020 ACS 5-Year Estimates

	Model 1	Model 2
	Has health insurance vs. uninsured	Private vs. public health insurance
	OR (s.e.)	OR (s.e.)
	N=1,444,781	N = 1,336,044
Race (ref. White)		
MENA	**1.156***	**0.485***
	(0.0713)	(0.0136)
South Asian	**1.890***	**0.631***
	(0.125)	(0.0258)
Black	**0.845***	**0.624***
	(0.0213)	(0.0159)

Latinx	**0.661*****	**0.631*****
	(0.00875)	(0.00786)
Asian	**1.268*****	**0.875*****
	(0.0211)	(0.0149)
Other	**0.796*****	**0.839*****
	(0.0244)	(0.0217)
Age (ref. 18-34)		
35-49	**0.956***	**0.963***
	(0.0191)	(0.0159)
50-64	**1.210*****	**0.789*****
	(0.0269)	(0.00856)
65+	**8.827*****	**0.173*****
	(0.650)	(0.00801)
Female	**1.513*****	**0.956*****
	(0.0176)	(0.0103)
Marital status (ref. Married)		
Never married	**0.614*****	**0.621*****
	(0.0104)	(0.0272)
Widowed/divorced/separated	**0.673*****	**0.698*****
	(0.0160)	(0.0365)
Citizen	**2.960*****	**1.148****
	(0.0419)	(0.0531)
Speaks English well/English only	**1.673*****	**2.425*****
	(0.0288)	(0.0301)
≥ Bachelor's degree	**1.661*****	**1.912*****
	(0.0353)	(0.0794)
% FPL (ref. ≤ 99% or more)		
100-199% FPL	**1.111*****	**1.606*****
	(0.0204)	(0.0635)
200-299% FPL	**1.202*****	**3.747*****
	(0.0278)	(0.271)
300-399% FPL	**1.494*****	**6.132*****
	(0.0500)	(0.520)
400% FPL	**2.606*****	**10.86*****
	(0.198)	(1.105)
Constant	**1.842*****	**0.544*****
	(0.0486)	(0.0289)

Notes: a. Results are weighted to population estimates; b. Standard errors are in parentheses; c. *** $p<0.001$, ** $p<0.01$, * $p<0.05$.

Neighborhood characteristics and health insurance status.

Any health insurance

MENA. After adjusting for individual-level covariates, only living in a suburban county increased the odds of having any health insurance compared living in an urban county (Table 5, Models 2 & 3). Adjusting for the neighborhood-level factors was not significantly better model for assessing having any health insurance compared assessing only individual level factors.

South Asian. Net of individual level factors, living in a suburban county (vs. urban) and immigrant neighborhood increased the odds of having any health insurance (p<0.05) (Table 5, Model 7). When assessed using the ethnic neighborhood typology, living in an advantaged immigrant co-ethnic neighborhood increased the odds of having any health insurance compared to those who lived in disadvantaged integrated non-co-ethnic neighborhoods net of other factors (Table 4, Model 8, aOR: 1.61; p<0.05). Including neighborhood context significantly improved the models for predicting having any health insurance among South, and examining each neighborhood-level characteristic individually was better than assessing the effects of neighborhood context through the ethnic neighborhood typology.

Private health insurance

MENA. Net of individual level characteristics, living in a suburban county increased the odds of having private health insurance compared to living in an urban or rural county (Table 6, Models 2-4, p<0.05). High neighborhood-level socioeconomic status increased the odds of having private health insurance (Table 6, Model 3). When neighborhood context was assessed using the ethnic neighborhood typology, living in an advantaged non-co-ethnic, advantaged immigrant co-ethnic neighborhood, and advantaged integrated co-ethnic neighborhood increased the odds of having private health insurance (Table 6, Model 4, p<0.05). After adjusting for

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neighborhood-level factors, age, sex, country of origin (from Iraq, Israeli/Palestine, Kuwait, Saudi Arabia, and Turkey), citizenship status, speaking English well or only English, having at least a Bachelor's degree, and living above FPL were significantly associated with having private health insurance. Including neighborhood context significantly improved the models for predicting private health insurance status and examining each neighborhood-level characteristic individually was better than assessing the effects of neighborhood context through the ethnic neighborhood typology.

South Asian. Among South Asians, living in a central city increased the odds of having private health insurance (Table 5, Models 6-8, p<0.05). Living in an area of high co-ethnic density lowered the odds of having private health insurance (Table 6, Model 7, p<0.05) and high neighborhood-level socioeconomic status increased the odds of having private health insurance (Table 6, Model 7, p<0.001). When applying the ethnic neighborhood typology, living in a disadvantaged integrated co-ethnic neighborhood lowered the odds of having private health insurance and advantaged non-co-ethnic neighborhood increased the odds of having private health insurance (Table 6, Model 8, p<0.01). After adjusting for neighborhood factors, age, being widowed, separated or divorced, country of origin (i.e. Afghanistan, Bangladesh, and Pakistan, India, and Burma, speaking English well or only English, having a Bachelor's degree or more, and living at least 200% FPL were associated with having private health insurance (p<0.05). Adjusting for neighborhood context significantly improved the models for predicting private health insurance status and examining each neighborhood-level characteristic individually was better than assessing the effects of neighborhood context through the ethnic neighborhood typology.

Table 5. Weighted binomial logistic regressions of any health insurance by neighborhood characteristics of MENA and South Asians (18+) in California based on 2020 ACS 5-Year Estimates

	MENA				South Asian			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	O.R. (s.e.)	O.R. (s.e.)	O.R. (s.e.)	O.R. (s.e.)	O.R. (s.e.)	O.R. (s.e.)	O.R. (s.e.)	O.R. (s.e.)
	N=22,165	N=22,165	N=22,165	N=22,165	N=30,563	N=30,563	N=30,563	N=30,563
Neighborhood level characteristics								
Geographic dimensions								
County classification (ref. urban)								
Suburban		**1.542***	**1.600***	1.583*		1.235	**1.546***	1.405
		(0.327)	(0.368)	(0.357)		(0.271)	(0.329)	(0.290)
Rural		0.954	0.996	1.019		0.920	1.159	0.967
		(0.713)	(0.745)	(0.804)		(0.473)	(0.568)	(0.474)
City		0.962	0.957	0.945		1.127	0.983	1.026
		(0.108)	(0.120)	(0.127)		(0.127)	(0.124)	(0.128)
Socioeconomic dimensions								
High co-ethnic density			0.968				1.157	
			(0.111)				(0.122)	
High foreign-born density			1.066				**1.474***	
			(0.130)				(0.223)	
High socioeconomic status			1.113				1.214	
			(0.128)				(0.161)	
Co-ethnic neighborhood type (ref. Disadvantaged non-co-ethnic)								
Disadvantaged immigrant co-ethnic				1.133				1.329
				(0.218)				(0.252)
Disadvantaged integrated co-ethnic				1.038				1.293

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				(0.233)				(0.249)
Advantaged non-co-ethnic				1.311				1.314
				(0.301)				(0.298)
Advantaged immigrant co-ethnic				1.146				**1.955*****
				(0.204)				(0.368)
Advantaged integrated co-ethnic				1.080				1.058
				(0.193)				(0.198)
Controls								
Age (ref. 18-34 years)								
35-49	0.835	0.843	0.841	0.837	1.100	1.101	1.069	1.080
	(0.113)	(0.115)	(0.115)	(0.114)	(0.192)	(0.202)	(0.197)	(0.192)
50-64	0.896	0.907	0.903	0.899	0.898	0.898	0.874	0.890
	(0.141)	(0.143)	(0.144)	(0.145)	(0.200)	(0.208)	(0.203)	(0.201)
65+	**4.284******	**4.372******	**4.317******	**4.306******	**3.342******	**3.354******	**3.194******	**3.266******
	(1.177)	(1.213)	(1.198)	(1.196)	(0.819)	(0.831)	(0.801)	(0.812)
Female	**1.428******	**1.422******	**1.421******	**1.419******	**1.241****	**1.240***	**1.219***	**1.223***
	(0.130)	(0.130)	(0.132)	(0.131)	(0.0998)	(0.105)	(0.108)	(0.106)
Relationship status (ref. married/co-habiting)								
Never married	**0.479******	**0.483******	**0.483******	**0.482******	**0.515******	**0.509******	**0.490******	**0.499******
	(0.0772)	(0.0788)	(0.0785)	(0.0788)	(0.0622)	(0.0626)	(0.0568)	(0.0581)
Widowed/separated/divorced	**0.514******	**0.514******	**0.514******	**0.514******	**0.568******	**0.566******	**0.574****	**0.576****
	(0.0752)	(0.0744)	(0.0745)	(0.0733)	(0.0913)	(0.0924)	(0.0940)	(0.0939)
Citizen	**2.531******	**2.527******	**2.523******	**2.516******	**1.806******	**1.820******	**1.882******	**1.876******
	(0.239)	(0.239)	(0.238)	(0.241)	(0.224)	(0.241)	(0.253)	(0.251)
Speaks English well or only English	1.037	1.031	1.020	1.027	1.433	1.433	1.387	1.397
	(0.218)	(0.210)	(0.207)	(0.210)	(0.270)	(0.297)	(0.293)	(0.282)

≥ Bachelor's degree	**1.321****	**1.330****	**1.316****	**1.326****	**1.942*****	**1.931*****	**1.855*****	**1.866*****
	(0.128)	(0.126)	(0.124)	(0.125)	(0.262)	(0.281)	(0.275)	(0.272)
% FPL (ref. ≤ 99%)								
100-199% FPL	0.899	0.903	0.898	0.894	**1.656***	**1.661***	**1.611***	**1.632***
	(0.117)	(0.116)	(0.115)	(0.115)	(0.330)	(0.324)	(0.315)	(0.313)
200-299% FPL	**0.546*****	**0.553*****	**0.551*****	**0.548*****	1.015	1.026	0.953	0.958
	(0.0836)	(0.0834)	(0.0837)	(0.0845)	(0.183)	(0.181)	(0.169)	(0.171)
300-399% FPL	0.799	0.799	0.788	0.786	1.228	1.237	1.154	1.182
	(0.143)	(0.145)	(0.141)	(0.140)	(0.232)	(0.242)	(0.230)	(0.234)
400% FPL	**1.609****	**1.632****	**1.594****	**1.587****	**3.704*****	**3.736*****	**3.251*****	**3.286*****
	(0.258)	(0.265)	(0.254)	(0.250)	(0.578)	(0.583)	(0.541)	(0.550)
Constant	**7.502*****	**7.323*****	**7.083*****	**6.831*****	**4.734*****	**4.518*****	**3.474****	**3.783*****
	(1.643)	(1.505)	(1.543)	(1.563)	(1.667)	(1.886)	(1.369)	(1.470)
Wald Test		1.910	1.190	1.200		0.590	**2.740***	**2.570***
p-value		0.136	0.320	0.309		0.624	0.018	0.016

Notes: a. Results are weighted to population estimates; b. Standard errors are in parentheses; c. *** $p<0.001$, ** $p<0.01$, * $p<0.05$

Table 6. Weighted binomial logistic regressions of having private health insurance by neighborhood characteristics of MENA and South Asians (18+) in California based on 2020 ACS 5-Year Estimates

	MENA				South Asian			
	Model 1 O.R. (s.e.)	Model 2 O.R. (s.e.)	Model 3 O.R. (s.e.)	Model 4 O.R. (s.e.)	Model 5 O.R. (s.e.)	Model 6 O.R. (s.e.)	Model 7 O.R. (s.e.)	Model 8 O.R. (s.e.)
	N=21,089	N=21,089	N=21,089	N=21,089	N=29,509	N=29,509	N=29,509	N=29,509
Neighborhood level characteristics								
Geographic dimensions								
County classification (ref. urban)								
Suburban		1.337*	1.515**	1.501**		0.771	0.831	0.863
		(0.176)	(0.205)	(0.191)		(0.133)	(0.160)	(0.166)
Rural		1.498	1.817*	1.760*		0.638	0.779	0.896
		(0.359)	(0.454)	(0.439)		(0.163)	(0.201)	(0.217)
City		0.929	1.004	1.029		1.215*	1.269**	1.224*
		(0.0683)	(0.0862)	(0.0927)		(0.0907)	(0.106)	(0.103)
Socioeconomic dimensions								
High co-ethnic density			0.987				0.797*	
			(0.0676)				(0.0706)	
High foreign-born density			1.056				0.997	
			(0.0784)				(0.0766)	
High socioeconomic status			1.501***				1.482***	
			(0.108)				(0.0992)	
Neighborhood type (ref. Disadvantaged non-co-ethnic neighborhood)								
Disadvantaged immigrant co-ethnic				0.966				0.996

				(0.114)				(0.151)
Disadvantaged integrated co-ethnic				0.923				**0.656****
				(0.161)				(0.0947)
Advantaged non-co-ethnic				**1.414****				**1.507****
				(0.161)				(0.185)
Advantaged immigrant co-ethnic				**1.466****				1.176
				(0.172)				(0.132)
Advantaged integrated co-ethnic				**1.463*****				1.256
				(0.156)				(0.149)
Controls								
Age (ref. 18-34 years)								
35-49	1.188	**1.194***	1.173	1.174	1.135	1.126	1.089	1.083
	(0.103)	(0.104)	(0.103)	(0.104)	(0.124)	(0.122)	(0.117)	(0.116)
50-64	1.005	1.015	0.988	0.989	**0.584*****	**0.580*****	**0.557*****	**0.546*****
	(0.116)	(0.118)	(0.114)	(0.115)	(0.0879)	(0.0865)	(0.0813)	(0.0783)
65+	**0.175*****	**0.176*****	**0.168*****	**0.167*****	**0.0653*****	**0.0642*****	**0.0600*****	**0.0590*****
	(0.0260)	(0.0267)	(0.0258)	(0.0260)	(0.00839)	(0.00825)	(0.00740)	(0.00739)
Female	**0.878****	**0.875****	**0.865****	**0.865****	0.934	0.929	0.921	0.918
	(0.0420)	(0.0421)	(0.0424)	(0.0423)	(0.0433)	(0.0430)	(0.0417)	(0.0412)
Relationship status (ref. married/co-habiting)								
Never married	0.975	0.982	0.968	0.967	0.996	0.972	0.946	0.927
	(0.102)	(0.103)	(0.101)	(0.101)	(0.112)	(0.104)	(0.0975)	(0.0940)
Widowed/separated/divorced	0.892	0.892	0.889	0.890	0.821	**0.816***	**0.817***	**0.810***
	(0.0915)	(0.0921)	(0.0897)	(0.0898)	(0.0831)	(0.0814)	(0.0804)	(0.0787)

Country of origin[a]								
Iraq	0.552***	0.538***	0.607***	0.614***				
	(0.0556)	(0.0539)	(0.0631)	(0.0739)				
Israel/Palestine	1.984***	2.003***	1.928***	1.923***				
	(0.236)	(0.239)	(0.232)	(0.232)				
Kuwait	1.889*	1.907*	1.851*	1.857*				
	(0.562)	(0.571)	(0.562)	(0.573)				
Saudi Arabia	3.743***	3.686***	3.884***	3.860***				
	(1.128)	(1.111)	(1.216)	(1.216)				
Syria	0.519	0.535	0.590	0.787				
	(0.227)	(0.232)	(0.259)	(0.121)				
Somalia	0.768	0.759	0.788	0.595				
	(0.119)	(0.117)	(0.120)	(0.263)				
Tunisia	1.519	1.531	1.390	1.402				
	(0.620)	(0.641)	(0.573)	(0.575)				
Turkey	1.985***	1.953***	1.917***	1.915***				
	(0.278)	(0.273)	(0.269)	(0.270)				
United Arab Emirates	2.754*	2.724	2.580	2.587				
	(1.402)	(1.392)	(1.301)	(1.308)				
Yemen	0.708	0.668	0.685	0.684				
	(0.172)	(0.164)	(0.175)	(0.174)				
Afghanistan					0.311***	0.320***	0.319***	0.319***
					(0.0574)	(0.0601)	(0.0602)	(0.0598)
Bangladesh					0.626*	0.597*	0.616*	0.621*
					(0.145)	(0.140)	(0.145)	(0.145)
Burma					1.725**	1.705**	1.667**	1.694**
					(0.321)	(0.312)	(0.310)	(0.311)
India					1.417*	1.477*	1.475*	1.506**
					(0.223)	(0.223)	(0.222)	(0.223)

Pakistan					**0.531***	**0.535***	**0.548**	**0.564**
					(0.0940)	(0.0965)	(0.0988)	(0.0995)
Citizen	**1.410***	**1.416***	**1.384***	**1.384***	1.103	1.131	1.135	1.141
	(0.124)	(0.125)	(0.125)	(0.125)	(0.0754)	(0.0763)	(0.0771)	(0.0777)
Speaks English well/ English only	**3.108***	**3.059***	**3.011***	**3.007***	**2.714***	**2.658***	**2.578***	**2.553***
	(0.312)	(0.309)	(0.311)	(0.307)	(0.218)	(0.211)	(0.205)	(0.197)
≥ Bachelor's degree	**1.811***	**1.817***	**1.771***	**1.768***	**2.731***	**2.643***	**2.561***	**2.539***
	(0.0904)	(0.0899)	(0.0871)	(0.0864)	(0.154)	(0.148)	(0.146)	(0.146)
% FPL (ref. ≤ 99%)								
100-199% FPL	**1.367**	**1.370**	**1.341**	**1.344**	0.883	0.898	0.896	0.897
	(0.144)	(0.144)	(0.141)	(0.142)	(0.112)	(0.118)	(0.117)	(0.121)
200-299% FPL	**2.889***	**2.896***	**2.871***	**2.875***	**1.974***	**1.994***	**1.972***	1.980***
	(0.346)	(0.353)	(0.354)	(0.354)	(0.303)	(0.301)	(0.310)	(0.309)
300-399% FPL	**5.332***	**5.313***	**5.161***	**5.173***	**3.852***	**3.801***	**3.662***	3.602***
	(0.999)	(0.999)	(0.947)	(0.942)	(0.501)	(0.486)	(0.482)	(0.477)
400% FPL	**11.14***	**11.21***	**10.52***	10.54***	**7.864***	**7.694***	**7.322***	7.224***
	(1.525)	(1.549)	(1.468)	(1.464)	(1.082)	(0.961)	(0.999)	(0.969)
Constant	**0.158***	**0.160***	**0.136***	**0.142***	**0.423***	**0.427***	**0.433***	0.434***
	(0.0206)	(0.0210)	(0.0192)	(0.0204)	(0.0870)	(0.0915)	(0.0997)	(0.103)
Wald Test		2.580	**6.630***	**5.030***		**6.190**	**6.930***	**6.230***
p-value		0.060	0.000	0.000		0.001	0.000	0.000

Notes: a. Countries of origin included if significant bivariate difference relative to general MENA or South Asian population (see Appendix G); b. Standard errors are in parentheses; c. Results are weighted to population estimates; d. *** $p<0.001$, ** $p<0.01$, * $p<0.05$;

Discussion

This study indicated that although MENA and South Asians had higher odds of having any health insurance compared to White Americans, and lower odds of having private health insurance, their neighborhood context played a role in their health insurance status. First, geographic dimensions of the neighborhood could shape MENA and South Asian health insurance status. Different geographic, social, and economic dimensions of the neighborhood were associated with health insurance status among MENA and South Asians. For example, among MENA, suburban residence was associated with any health insurance and high neighborhood-level socioeconomic status increased the odds of having private health insurance. Among South Asians suburban residence, and living in an immigrant neighborhood increased the odds of having any health insurance while high co-ethnic density and high neighborhood-level socioeconomic status were associated with having private health insurance. The ethnic neighborhood typology was also a significant predictor of having any health insurance status among South Asians, and having private health insurance among MENA and South Asians.

In terms of geography, suburban areas are known to have better access to healthcare and health outcomes for smoking, mortality, and suicide (Eberhardt & Pamuk, 2004) compared to urban and rural communities (Schnake-Mahl & Sommers, 2017; Kellermann & Snyder, 2004; Vastag, 2001). With regard to MENA Americans, high socioeconomic status at the neighborhood level increased odds of being privately insured. This may be driven by the large proportion of affluent Iranians who reside in advantaged neighborhoods of Southern California. However, this may not be capturing the experience of a significant proportion of MENA Americans who entered the U.S. as refugees particularly from 2002-2018 (*Refugee Resettlement in U.S. Cities*, n.d.). While MENA refugees may have access to special status which offer them

access to public health insurance options, they may not have the means to obtain private health insurance which could improve the quality of the health services that they receive.

For South Asians, living in an immigrant neighborhood increased the odds of having any health insurance and high neighborhood-level socioeconomic status increased the odds of having private health insurance while living in a co-ethnic neighborhood lowered the odds of private health insurance. The association between living in an immigrant neighborhood and neighborhood with high socioeconomic status may be driven by the specific geographic contexts where South Asians were densely concentrated, which in Chapter 6, was found to be in Santa Clara County, Alameda County, and Contra Costa County. Each of these counties are within the demarcation of Silicon Valley (Silicon Valley Historical Society, 2023), which is known for having a 40% immigrant population (Giaritelli, 2016) and a tech industry that is 75% immigrant (Baron, 2018). Immigrant in this specific industry hail from India, Taiwan, China, and Japan among other countries, perhaps, pointing to a potentially dense immigrant presence who also happen to be high income earners (Alarcon, 1999; Almasalkhi, 2023; Saxenian, 2000, 2022). These findings, however, may be very specific to the state context of California and specific industries that drive South Asian resettlement within this state, and less representative of South Asians in other U.S. states.

Unexpectedly, co-ethnic density lowered the odds of having private health insurance among South Asians. Similar trends have been observed in the Hispanic immigrant community, in which co-ethnic density was associated with lower healthcare coverage at the state level (Cebula, 2006). This may mean that even though living within a co-ethnic network may help South Asian immigrants gain access to basic healthcare resources through their social networks and community providers (Leduc & Proulx, 2004; L. Wang, 2007; L. Wang et al., 2008), they

may face barriers to accessing higher quality services that are attainable through private health insurance, including services for mental health disorders, chronic disease management (Fabricant et al., 2019), and pregnancy complications (Greiner et al., 2020).

The ethnic neighborhood typology indicated differences in MENA and South Asian health insurance status. However, it appeared that assessing the neighborhood context through each social and economic dimension independently was better predictor of health insurance status for MENA and South Asians than the ethnic neighborhood typology. The effects of the social and economic dimensions of neighborhood on health insurance status may balance out when assessed as a typology. Still, the typology points to ways in which the MENA and South Asian population even within the state of California exhibits rich diversity, and that this diversity is apparent through their neighborhood contexts. Furthermore, the ethnic neighborhood typology demonstrates strong support for assessing health inequities in MENA and South Asian communities with consideration of the heterogeneity within this population.

Future research on MENA and South Asian health access should explore how factors such as country of origin, citizenship, visa, or refugee status, and occupational background may shape ethnic neighborhood contexts and in turn, health insurance status. For example since 9/11, at least 97,000 Afghans and 144,400 Iraqis (up until 2019) resettled in the U.S. under refugee status or through a special immigrant visa (Krogstad, 2019; Waddell, 2021). Due to their special visa status, refugees and asylees are able to enroll public health insurance programs like Medicaid, the Children's Health Insurance Program (CHIP), Refugee Medical Assistance (RMA), or obtain coverage through the Health Insurance Marketplace and bypass the five-year enrollment requirement (Kaiser Family Foundation, 2023a). Often immigrants who enter from countries such as India, Israel, Saudi Arabia, Kuwait, and Turkey also arrive under special visa

programs for educational and employment opportunities. For example, Indian Americans are the top recipients of H1-B and J-1 visas, which gives them access to highly skilled professional opportunities in the U.S. (Taylor, 2023). Indian Americans have also attained some of the highest median household incomes in the state California and have better access to healthcare than other South Asian subgroups and even White Americans (Taylor, 2023). Similarly, students from Saudi Arabia, who since 2005 have been offered a government-sponsored scholarship that is inclusive of tuition, room and board, clothing, medical care, and a yearly round trip flight to Saudi Arabia to study in the U.S., may acquire healthcare access more easily than MENA from other countries (Schryer, n.d.). The geopolitics between the U.S. and sending nations as well as the sociopolitical climate within the U.S. are likely to shape the circumstances that each subgroup of MENA and South Asian Americans enters the country, the type of visa or special statuses they are able to obtain, and the employment opportunities they are able to secure. This, in turn, may have differential downstream effects on their resettlement contexts and access to social and healthcare services. Future work should consider ways of examining the if immigration and citizenship status or country of origin are associated with ethnic neighborhood context among MENA and South Asians, and then, if these factors are associated with health insurance status within these groups.

Finally, while California was an appropriate state context for this study, it is also known to have a relatively inclusive health policy climate for immigrants (Brooks et al., 2018; *Medi-Cal Expansion Provided 286,000 Undocumented Californians With Comprehensive Health Care*, 2022). While this means that immigrants in this state may have better access to healthcare that immigrants in other states, it may also be mitigating the effects of the neighborhood on health insurance status. California serves as a positive example for ways that access to healthcare can be

improved for immigrants across the country, but also suggests that effects of ethnic neighborhood on health insurance status should be examined among MENA and South Asian populations in other state policy contexts.

Limitations

This study had some limitations. First, no causal claims can be made from this study. Next, the ACS did not have an explicit measure for MENA and South Asian race/ethnicity and definitions of who *is* MENA and South Asian American vary in the literature. Grassroots organizations have attempted to address this question by pushing for better representation of MENA and South Asian populations in Census data and other national surveys. Other groups have used decolonial label of "South West Asians and North Africans (SWANA)" to identify immigrants from the MENA region and South Asia based on their collective opposition to "white supremacy, imperialism, heteropatriarchy, and capitalism". For this study, I used indicators of country of birth and parents' country of birth, limiting the analysis to first- or second-generation MENA and South Asian immigrants, which is a methods used in prior research (Abuelezam et al., 2018). Another limitation of this study was that it used an arbitrary spatial boundary (PUMA) as the unit of measurement for assessing neighborhood effects. Such spatial boundaries for neighborhoods are often "modifiable" (i.e. they can be aggregated to form units of different sizes or spatial arrangements at any point in time that lead to different results) (Openshaw, 1984). Finally, the geographic classification measure is also limited since urban, suburban, and rural classifications could be subject to change, and even somewhat arbitrary considering new metropolitan and county designations can be redefined and areas that have previously been classified as urban may have areas of fringe/suburban areas while suburban counties may have areas with more levels urbanization (Eberhardt & Pamuk, 2004).

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Conclusion

This study indicated that social and economic dimensions of the neighborhood are critical determinants of health access in MENA and South Asian immigrant communities, however, different aspects of the neighborhood may be more important for predicting health access for Americans and South Asian Americans. For MENA Americans, socioeconomic advantage was important for predicting health insurance status while co-ethnic density and foreign-born density was important for South Asians. Finally, these specific neighborhood characteristics were better predictors of health insurance status for MENA and South Asian Americans instead ethnic neighborhood typology. Future studies should examine if the ethnic neighborhood typology could be used to assess disparities in MENA and South Asian health outcomes including self-rated health, maternal and child health outcomes, and chronic conditions, or other ways to examine multiplicative effects of various social and economic dimensions of the neighborhood using conditional or stratified analyses. Future studies should account for intragroup differences within the MENA and South Asian immigrant population through their countries of origin and citizenship and visa statuses since these differences may offer more historical and sociopolitical contexts to factors that shape MENA and South Asian health.

Chapter 8: Examining the role of citizenship status on contraceptive use among women in California

Aim 3

Introduction

There are approximately 23 million foreign-born women in the U.S. of which 54% are of childbearing age (15-45 years) (Batalova, 2018). Contraception can help immigrant women control their fertility and avoid adverse reproductive health outcomes including unintended

pregnancy, STI, need for abortion, and pregnancy complication. Furthermore, the use of contraception can enable immigrant women even achieve educational, professional, and financial stability, ensuring their ability to establish a safe, healthy, and secure life in the U.S. (Hasstedt et al., 2018a). Increasing restrictions around immigration and reproductive health over the past decade, however, have compounded immigrant women's barriers to sexual and reproductive healthcare (SRH) and resulted in disparities in their ability to access and use contraception. According to the 2017-2020 California Health Interview Survey (CHIS), 35% of reproductive-aged immigrant women who were at risk of becoming pregnant were not using any method of contraception compared to 26% of U.S.-born women (author's tabulations). Citizenship status, which is a legal classification designated in immigration policies that confers immigrants with differential degrees of legal and social protection and rights within the U.S. (Bosniak, 2008b; De Genova, 2002), is another criteria immigrants must meet to access healthcare in most states, including certain SRH services. In fact, from 2017-2020, CHIS indicated that naturalized citizens and legal permanent residents (LPRs) had lower use (63% each) compared to non-citizens without a green-card (71%) and U.S.-born citizens (74%; author tabulations). With an increasingly restrictive immigration policy context and anti-immigrant rhetoric that intensified during the Trump administration, this study aimed to examine if citizenship status was associated with contraception use among 18-44 year old, cis-gender, sexually active women who were at risk of becoming pregnant. Given the racial and ethnic diversity of immigrants in California, this study also examined differences in the association between citizenship status and contraception use by race/ethnicity .

Background

Literature review: contraceptive use among immigrant women

      Women from immigrant and minoritized communities often face more barriers to SRH compared to the general population (Desai & Samari, 2020b; Hasstedt & Rowan, 2016; Tapales et al., 2018b). Most studies attribute these disparities to sociodemographic and behavioral characteristics. Studies report that among immigrants or those of immigrant family background, nativity (Chao et al., 2016; Sangi-Haghpeykar et al., 2006), race/ethnicity (Foster et al., 2004; Garcés-Palacio et al., 2008; Jones et al., 2012; Kim & Raley, 2015; Sangi-Haghpeykar et al., 2006; Shih et al., 2011), age (Kavanaugh & Pliskin, 2020), socioeconomic status (Garcés-Palacio et al., 2008; Jacobs & Stanfors, 2013; Kavanaugh & Jerman, 2018; Kavanaugh & Pliskin, 2020), parity (Garcés-Palacio et al., 2008; Kavanaugh & Pliskin, 2020; E. K. Wilson & Koo, 2008), and relationship status (Foster et al., 2004; Garcés-Palacio et al., 2008; Wilson & Koo, 2008) are associated with contraception use among immigrants women. According to the National Survey for Family Growth (NSFG), foreign-born women use SRH services at lower rates than U.S.-born women, and foreign-born Black and White women were less likely to use the most effective methods of contraception compared to U.S.-born women of the same race/ethnicity, though among Hispanic women the reverse was true (Tapales et al., 2018b). One study of American Muslims (N=224) found that U.S.-born women had lower odds of using any contraception, oral contraceptive pills, and condoms and higher odds of using withdrawal method compared to foreign-born women (Budhwani et al., 2018).

      Behavioral factors that are associated with contraception use among immigrants include knowledge and attitudes (Garcés-Palacio et al., 2008; Gonzalez et al., 2010; Kaye et al., 2009; Quelopana & Alcalde, 2014; White et al., 2017), the perceived ability to become pregnant (Kaye

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et al. 2009; Mosher et al. 2012), culture and religion (Budhwani et al., 2018), acculturation (Castañeda et al., 2015; Romo et al., 2004), medical adherence and preventive screenings (Castañeda et al., 2015). In a study of Korean immigrants, combining condoms, rhythm and withdrawal was preferred due to distrust toward hormonal methods and fears that hormonal methods can cause permanent harm (Wiebe et al., 2006). One study of racially diverse Muslim immigrant women also reported cultural, religious, and sec related barriers to contraception use (Budhwani et al., 2018). Studies that focus on acculturation have found that measures such as language, time in the U.S., and development of an immigrant network were related to changing beliefs, attitudes, norms, and intentions regarding contraception (Brown et al., 2003; Gonzalez et al., 2010; Romo et al., 2004; White et al., 2017; Lee, 2007). For example, one study found that primary use of Spanish increased the odds of inconsistent contraception use (Brown et al., 2003), while another study of pregnant Latina women aged 18-40 years from two university reproductive health clinics in southeast Texas found that primarily speaking Spanish was associated increased odds of consistent contraception use along with longer residency in the U.S. among Spanish-speaking women (Romo et al., 2004). Another study of Latina women in Birmingham, Alabama found that after emigrating to the U.S., immigrants who became involved in a trusted immigrant support network were able to navigate the health sector more easily and learn where to obtain contraception (White et al., 2017).

Human rights perspectives on contraception use. More recently, studies on SRH have taken on a human rights approach to examine contraception use among immigrants. This perspective asserts the "basic right of all couples and individuals to decide freely and responsibly the number, spacing, and timing, of their children" (*Report of the International Conference on Population and Development* [ICPD], 1994) and each individual's right to reproductive

autonomy and privacy with SRH (Shalev, 1998). These studies highlight the role of partner dynamics including partner decision-making and communication in shaping contraception use (Quelopana & Alcalde, 2014; White et al., 2017). Studies of Latina women have indicated that discussing contraception use with intimate partners is difficult and discouraged (Quelopana & Alcalde, 2014; White et al., 2017). Only a few studies report that patriarchal ideologies and lack of partner communication were not major barriers to contraception decision-making (Gonzalez et al., 2010; Wiebe et al., 2006).

Reproductive justice lens of contraceptive use. There is a nascent literature that emphasizes growing disparities in contraception use among minoritized populations including Black and Latina women and immigrants. For example, the 2006-2010 NSFG indicated that among unmarried Hispanic and Black sexually active women aged 15–24, pregnancy rates were double and four times that of White women, respectively ; Sweeney & Raley, 2014) and use of highly effective methods of contraceptive was significantly lower among Black women compared to Whites (Jacobs & Stanfors, 2013). Coercive sterilization practices and testing of the earliest formulations of the birth control pill on racial and ethnic minorities fostered a legacy of mistrust toward contraception among racial and ethnic minorities in the U.S. (Gordon, 2002; Roberts, 1999) and poses a major barrier to their contraception use (Rocca & Harper, 2012). Recently, promotion of SRH among racial and ethnic minorities has adopted a reproductive justice (RJ) framework, which asserts that childbearing peoples, especially indigenous women and women of color, have the right "to have a child, not to have a child, to parent the children they have, and have control of their birthing options" (*Reproductive Justice*, n.d.), as a way to promote best practices related to contraception, pregnancy, and childbearing, while also preserving the safety of these communities (Ross, 2017).

Among reproductive-aged immigrant women who did not intend to become pregnant, 35% had not used any method of contraception in the past year (author's tabulations). Access to contraception among immigrants can be impeded by restrictive immigration and reproductive health policies, which are often conferred based on citizenship status. Even in California, which is known for its relatively inclusive policy landscape for immigrants, nearly half (46%) of undocumented immigrants, 25% of documented immigrants, and 8% of U.S.-born citizens still lack health insurance (Kaiser Family Foundation, 2023a). In the next section, I will discuss why citizenship status, a status which is used to differentiate degrees of rights and access among U.S. residents, is an important factor to consider when examining immigrant women's contraception use.

The role of citizenship status on contraception use

California is home to 10.5 million immigrants (Perez, Mejia, et al., 2021) among which 78% are naturalized citizens, LPRs, or temporary visa holders and 22% are undocumented (Perez, Mejia, et al., 2021). Nearly half (49%) of California's immigrant population is Latinx and 39% are Asian American (Budiman & Ruiz, 2021). The breakdown of citizenship status varies within these racial/ethnic groups. Data from the 2019 California Immigrant Data Portal indicated that about 36% of Latino immigrants in California are naturalized citizens, 28% are LPRs, and 35% are undocumented; among Asian immigrants 63% are naturalized citizens, 27% are LPRs, and 10% are undocumented (Anon, 2022a). These statuses imply differential degrees of legal protections, access to political rights and labor market and social opportunities (Bosniak, 2008) and vulnerability to immigration enforcement actions (Asad & Clair, 2018). For example, immigrants who are present on discretionary, temporary, or undocumented status face the greatest barriers to social benefits including housing discrimination, limited civil and labor

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protection, and healthcare (Hall & Greenman, 2013; McConnell, 2015; Jones-Correa & De Graauw, 2013). For example, in most states, Medicaid and the Children's Health Insurance Program (CHIP), which are two state-administered public health coverage programs for eligible low-income adults, children, pregnant women, elderly, and people with disabilities, are not available to immigrants with "unqualified" status (i.e., in the U.S. for less than 5 years after obtaining LPR status) (Kaiser Family Foundation, 2023b). Some states allow exceptions to these rules. For example, in California, Medicaid and CHIP was made available to pregnant women and girls and children who were lawfully residing immigrants for less than 5 years (Hasstedt et al., 2018a) and since May 2016, Medi-Cal, another state-funded healthcare program, made free and low-cost state health insurance available to non-citizens aged 19 and younger (Anon, 2022b). By January 2020, a full scope of Medi-Cal was also extended to young adults under 25 years, regardless of their citizenship or legal status (Anon, 2022b). Still, in 2020, the uninsured rate among non-elderly Californians was 7%, including 18% of noncitizens (Hartman, 2022).

California also has a few state health programs that have facilitated contraception access across the state including the Family Planning, Access, Care, and Treatment (Family PACT) program, which offers contraception access for low-income women and immigrants (Anon, n.d.-b), and Covered California which provides a twelve month supply of FDA-approved methods of contraception including the ring, patch, and oral contraception to individuals for twelve months (*Let's Talk BIRTH CONTROL (Contraception),* n.d.; *Information for Immigrants: Most Immigrants Qualify for Health Coverage,* n.d.; *Let's Talk BIRTH CONTROL (Contraception),* n.d.). Today, 67% of Family PACT clients are Latina and 6.4% are Asian (Office of Family Planning, 2020). California also mandated access to specific family planning services to undocumented immigrants, like emergency contraception and pregnancy-related services

through Medi-Cal (Lucia, 2019). The most substantial options for subsidized healthcare for undocumented immigrants in California are only available in select counties, including Los Angeles, Sacramento, San Diego, and San Francisco County (Kelch, 2015). Within California, the Deferred Action for Childhood Arrivals (DACA) program, which was created to protect eligible young adults who were brought to the U.S. as children from deportation and provide them with work authorization for temporary, renewable periods (Kaiser Family Foundation, 2023b), has also been associated with increased consistency of contraception use among undocumented women in California (Sudhinaraset et al., 2022).

Although California has provided more inclusive healthcare options immigrants, the Trump administration may have undone some of these efforts. Just within the first 100 days President Trump's term, there was a 40% rise (30,028 to 41,318 arrests) in immigration enforcement and removal operations (Anon n.d.). Forced removals by immigration enforcement officials also intensified during the Trump administration. Unlike under the Obama administration, which provided specific guidance and criteria that apprehension and removal be limited to undocumented immigrants who posed a threat to public safety and national security and recent entrants, the Trump administration targeted all undocumented immigrants regardless of level of threat and their time of entry (Law Enforcement Immigration Task Force, 2021). ICE practices under President Trump were also notorious for separating immigrant families and communities (Law Enforcement Immigration Task Force, 2021). Data from the National Survey of Latinos indicated that deportation fears among Latinos increased under the Trump administration even among citizens (Asad, 2020) and were reported as a reason that immigrant women avoid using preventative SRH services even when they had healthcare coverage (White et al., 2017). Furthermore, with disproportionate levels of ICE arrests of Latino men (Menjívar et

al., 2016; J. S. Passel & D'Vera Cohn, 2011), immigrant women and their children were at risk of losing financial resources to acquire SRH services (Asad & Clair, 2018; Cervantes, Ullrich, & Matthews, 2018; Coleman-Minahan & Samari, 2018).

The 2017 "public charge rule" which attempted to disqualify individual admission into the U.S. and adjustment to legal permanent residency status on the grounds that immigrants who were using public assistance programs were a "public charge" (Fremstad, 2018) also had "chilling effects" on immigrant women and their families. Even many eligible immigrants refrained from enrolling in Medicaid and Medicare (US Centers for Medicare & Medicaid Services, n.d.) and utilizing other health services (S. W. Choi, 2023; Ettinger de Cuba et al., 2023; S. S. Wang et al., 2022). A study conducted in Boston, Minneapolis, and Little Rock found that the election of President Trump and the proposed "public charge" rule change were associated with reduced well-child visit adherence among children of immigrants compared to the children of U.S.-born (Ettinger de Cuba et al., 2023), and studies of Latinx immigrants indicated increased odds of preterm birth among uninsured birthing people (S. W. Choi, 2023), delays in prenatal Medicaid enrollment among immigrant mothers, and declines in birth weight among the infants (S. S. Wang et al., 2022).

Immigrant women are also known to be more reliant on publicly-funded Title X clinics compared to U.S.-born women (Frost et al., 2021a). Under the "domestic gag rule", which significantly reduced funding for Title X family planning clinics across the country (Dawson, 2021; Hasstedt et al., 2018), immigrant women were expected to be disproportionately affected since Title X clinics are among the few healthcare settings where immigrants are not required to disclose their citizenship or legal status (Dawson, 2021; Hasstedt et al., 2018).

Whether due to immigration enforcement policies and practices, restrictions on healthcare, or significant reductions in SRH funding, citizenship status has serious implications for immigrant women's SRH, including their access to contraception. Reproductive-aged non-citizen women have nearly four times the risk of being uninsured (34% compared to 9% for U.S.-born women) (Sonfield, 2018). A study from Guttmacher also found that among patients recruited from Title X centers across the country, immigrants reported that immigration status was their primary barrier to having healthcare coverage (Kavanaugh et al., 2018). According to the Current Population Survey (CPS), long-term permanent residents also avoided Medicaid enrollment in response to punitive immigration policies (Watson, 2014), and even when they were insured, one in five did not plan to use their insurance due to fears related to their documentation status and linguistic and logistical barriers (Kavanaugh et al., 2018).

While citizenship status may be an important determinant of SRH access and contraception use among immigrant women, this self-identity is not occurring in a vacuum. With the way that immigration policies affect immigrants, it is hard to separate whether immigrants are targeted along lines of citizenship or a perceived citizenship status because of their racial and ethnic identity. In the next section, I explore how the relationship between citizenship status and immigration may also be conditional on race/ethnicity.

Racialized legal status and sexual and reproductive health

Despite their claim of being "race-neutral", immigration policies are known to reproduce ideologies and processes that define belonging and deservingness for residency and rights in the U.S. along racial and ethnic lines (Gee & Ford, 2011). This can be observed in the racialized nature of immigrant enforcement practices which target immigrants on the basis of their skin color, language, or any other characteristics that are used to conflate race or ethnicity with

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citizenship status (Asad & Clair, 2018; Gee & Ford, 2011; Viruell-Fuentes et al., 2012). The earliest example of this dates back to the 1790 Naturalization Act which barred any non-White persons from becoming a U.S. citizen (Gee & Ford, 2011). Racial double standards in the twentieth century were also evident in a series of policy changes at the federal level when Cuban immigrants were welcomed to the U.S. and granted refugee or permanent resident status while the 1924 Immigration Act (a.k.a, "Asian Exclusion Act and National Origins Act") barred all Asian immigrants (except Filipino "nationals") from citizenship and naturalization, landownership, and marriage to Whites (Newman, 2019; United States Department Of State, n.d.). Immigration enforcement practices of the twenty-first century have also been described as a *racial project* (Asad, 2017; Golash-Boza & Hondagneu-Sotelo, 2013). One only needs to look to Latinx individuals, who despite making up only two-thirds of the undocumented population, comprise 95% of detainees and deportees of the immigration enforcement system (Menjívar et al., 2016; J. Passel & Cohn, 2014). Additionally, when documented immigrants are caught in the immigration enforcement system, they are known to suffer the same consequences as undocumented immigrants including harsh detention measures and even deportation (Asad, 2017; Barillas, 2014; Golash-Boza, 2014; Golash-Boza & Hondagneu-Sotelo, 2013).

The racialized nature of immigration enforcement may influence how citizenship status effects contraception use among immigrants of different racial and ethnic identity. For example, Latinas report strong fears of being deported and are therefore reluctant to obtain healthcare (White et al., 2017). Another study found that although encounters with immigration enforcement were associated with delays in care for both Latinx and Asian Americans, encounters with immigration enforcement were higher among Latinx (Young et al., 2023).

Among Asian immigrants, becoming undocumented is often a consequence of visa overstays. When this happens, Asian immigrants lose access to healthcare services, become at risk of being targeted by immigration enforcement, and are isolated from their support networks (K. Ramakrishnan & Shah, 2017). Due to feelings of shame that accompany the loss of documentation status, undocumented Asian Americans are less likely to enroll in programs that could improve their access to material and health resources. For example, reports from DACA indicate only 21% of DACA applicants are Asian American compared to 77% Latinx (Rusin, 2015). Even among Asians who are DACA eligible, only 13% use the program (Migration Policy Institute, 2018). These disparities may trickle down to their SRH access and contraception use. In 2017, approximately 10% of reproductive aged Asian American women were uninsured (Berchick et al., 2018), under 40% were using contraception regularly, and another 40% were having unprotected sex, which is the highest rate of unprotected sex compared to any other race or ethnic group (Choimorrow, 2018).

Understanding factors that contribute to immigrant contraception use is complex but critical in guaranteeing reproductive justice for immigrant women. This study used data from the 2017-2020 CHIS to examine the association of citizenship status on contraception use among cis-gender, heterosexual 18-44 year old women in California who were at risk of becoming pregnant (i.e., were sexually active in the past 12 months, could become pregnant, and did not plan to become pregnant in the next 12 months). Finally, understanding that immigration policies in practice are not truly "race-neutral" and that immigrants of different racial and ethnic backgrounds have different migration contexts and experiences with the immigration system, I examined if the association between citizenship status and contraception use was different among Latinx and Asian Americans.

Conceptual Framework

The Reproductive Justice (RJ) framework (L. J. Ross, 2017) and Socioecological Model (SEM) (McLeroy et al., 1988; Sallis et al., 2015) provide the theoretical frameworks for this study. I also use the theorized pathway for how immigration-related policies and policies relevant to immigrants influence Latino health disparities in the U.S. (Philbin et al., 2018) and the model for how structural racism affects health outcomes among immigrants (Misra et al., 2021) for the theoretical justification of the study. Finally, the framework on the health effects of racialized legal status provide support for the expected moderating effects of race/ethnicity on the association between citizenship status and contraception use (Asad & Clair, 2018).

The RJ framework asserts the right of childbearing peoples "to have a child, not to have a child, and to parent the children they have, and have control of their birthing options" (*Reproductive Justice*, n.d.). This framework underscores the ways in which social inequalities have shaped SRH and how our government and public institutions perpetuate these inequalities (L. J. Ross, 2017). Indeed, immigration policies, which are often enforced through citizenship status, reinforce differential degrees of legal protection and surveillance: access to political, labor market, and social opportunities among immigrants (Bosniak, 2008); and can pose as barriers for immigrants access to contraception.

Next, I used SEM, which posits that "health behavior and promotion are interrelated" and occur through the interplay of individual, interpersonal, institutional, community, and policy factors (McLeroy et al., 1988). The integration of contextual factors (i.e., factors that span the community, institutional, and policy level) makes SEM unique from other theories of health behavior which focus on the individual with no explicit recognition for how the social environment shapes health (McLeroy et al., 1988; Sallis et al., 2015). Traditionally, SEM has

been used to develop interventions that target specific health behaviors; however, it is also a useful tool for identifying, understanding, and describing how factors across multiple levels of the social environment influence health outcomes (Ajayi et al., 2021; Aura et al., 2016; Garney et al., 2021). I integrated SEM in the examination of policy level factors on immigrant women's contraception use (Viruell-Fuentes et al., 2012).

The theorized pathway of how immigration-related policies shape Latinx health in the U.S. suggests that policies related to immigration are a form of structural racism that limit healthcare access and contribute to stress, discrimination, and illness among racial and ethnic minorities (Philbin et al., 2018). This theory describes four mechanisms by which immigration policies influence health. First, through stress produced by structural racism (i.e. "social forces, institutions, ideologies, and processes that interact with one another to generate and reinforce inequities among racial and ethnic groups") (Gee & Ford, 2011), then, via immigration policies which prevent access to beneficial social institutions, such as education and health institutions, and via one's material conditions (i.e. access to food, income, and adequate housing) (Philbin et al., 2018). Policies that affect immigrants range from immigration enforcement laws and healthcare eligibility to those that limit employment (Philbin et al., 2018). Ultimately, these policies restrict immigrant access to health resources and services, which could eventually influence health outcomes. Among immigrant women, this may mean less willingness to engage with the formal health sector to obtain highly- or moderately-effective methods of contraception due to fears of detention or deportation (Noe-Bustamante et al., 2020; Stafford et al., 2023). Rules around public charge also created confusion over eligibility for services, even among legal residents, which reduced their access to healthcare and material resources (Hardy et al., 2012) and limited contraception choice.

Misra et al. (2021) also proposed a pathway of how structural racism affects immigrant health. According Misra et al. (2021), immigration policies and citizenship status shape access to material and health resources and political and civic participation, disproportionate immigration enforcement and criminalization result in the ongoing threats of detention and deportation, and economic exploitation and disinvestment lead to labor exploitation and neighborhood disinvestment. I synthesized Misra et al.'s (2021) pathway of how structural racism affects immigrant health with the theorized pathway proposed for how immigration-related policies shape Latinx health in the U.S. proposed by Philbin et al (2018). These theories informed the conceptual model in this study for how citizenship status shaped immigrant contraception use and demonstrate the role of health insurance status as a potential mediator of the relationship between citizenship status and contraception use among immigrant women.

Asad and Clair's (2018) conceptual model linked racialized legal status to racial/ethnic health disparities. This theory suggests that although immigration policies do not explicitly target specific racial/ethnic groups, the political rhetoric and media messaging around immigration creates a hostile environment for anyone who is perceived to be an immigrant because of their skin color, language, or other characteristics that could be used to conflate ethnicity and legal status (Gee & Ford, 2011; Viruell-Fuentes et al., 2012). This results in racial minorities, such as Black and Latinx, being disproportionately affected by immigration enforcement procedures including surveillance, detention, and deportation (Asad & Clair, 2018; Pager & Shepherd, 2008; Rosenblum & McCabe, 2014), which increases stress and fear among these racialized groups and adversely affects their health (Asad & Clair, 2018). This theory was used as justification for examining the role of race and ethnicity as a moderator of the association between citizenship status and contraception use.

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Figure 1. Conceptual model of the association between citizenship status and contraception use
(*included in analysis)
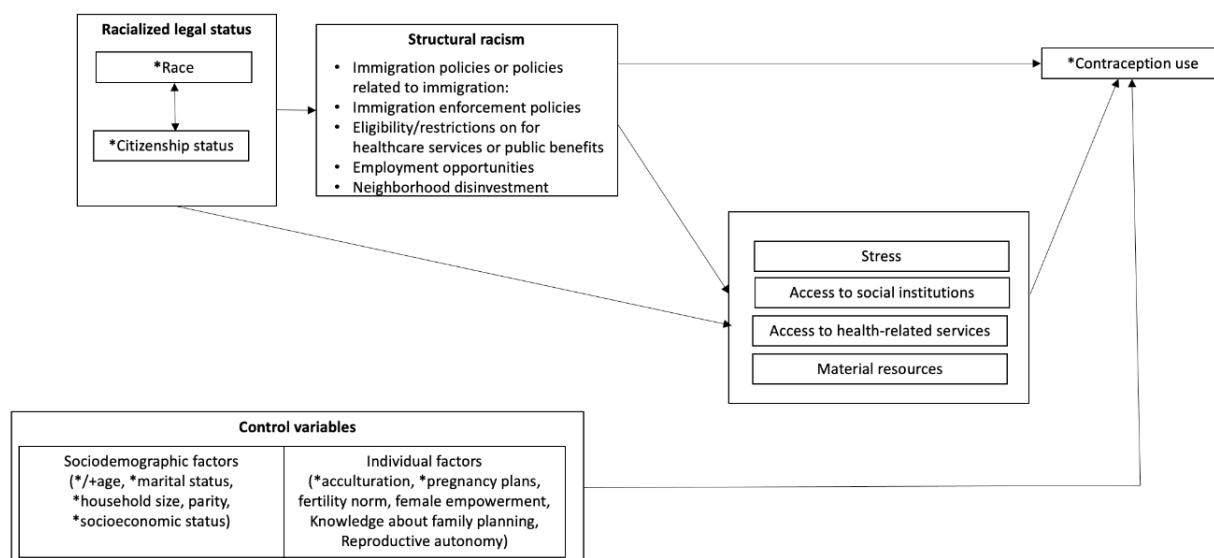
Methods

Data

      This study used data from the 2017-2020 waves of the adult (18 years and older)

California Health Interview Survey (CHIS), which is a multi-wave population-representative

survey of health and healthcare needs in California (UCLA Center for Health Policy Research,

n.d.). Sampling methods included a telephone-multimode method of random-digit-dialing of

landline and cell-phones numbers (2017, 2018) (CHIS, 2019a) and address-based sampling

(ABS) by phone and web[24] (2019, 2020) (CHIS, 2021a). Respondents were offered a $2 pre-

incentive ($5 for cellphone participants) and $25 for survey completion (CHIS, 2019b, 2021b).

The adult interview response rate was 3.4% from 2017-2018 and 12.2% from 2019-202025

(Appendix H provides details on how composite response rates were calculated).

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[24] The change to web-based sampling methods improved the geographical precision for acquiring addresses for the sampling frame, lowered study costs, and improved survey response (California Health Interview Survey, 2021a).

Data was collected using a computer-assisted-telephone- and web-interviewing system (only in 2019 and 2020) and conducted in English, Spanish, Chinese (Mandarin and Cantonese), Vietnamese, Korean, and Tagalog for 35 to 48 minutes (CHIS, 2019b, 2021b). Surveys that reached at least 80% completion were included in the data (California Health Interview Survey, 2019b, 2021b). The original study was approved under UCLA Human Subjects Protection Committee (IRB) under IRB#11-002227 (*CHIS Frequently Asked Questions (FAQs)*, n.d.)

The 2017-2020 CHIS included a sample of 86,439. The analytic sample was limited to 5,804 respondents which included cis-gender, heterosexual, sexually-active women between 18-44 years in California who were at risk of becoming pregnant (i.e. could become pregnant and did not plan to become pregnant in the next 12 months; see Figure 2). Permanent method users (N=1,361) were excluded.

Measures

Dependent variable(s). Contraception use was defined as the use of a reversible method of contraception in the past 12 months using two survey items. First, respondents indicated if they or their male sex partner were "using a birth control method to prevent pregnancy in the past 12 months". This item was recoded into a binary variable (0=no, 1=yes) and those who responded, "no male sexual partner", "refused", and "don't know" were excluded from the analysis. Next, in multiple response question respondents who reported "yes" to using contraception were asked which type of contraception method they had used from a list that included "tubal ligation (tubes tied or cut)", "vasectomy (male sterilization)", "IUD (Mirena, Paragard)", "implant (Implanon, Explanon)", "birth control pills", "other hormonal methods (injection/Depo-provera, patch, vaginal ring/Nuva ring)", condoms (male), or "other (included a write-in option)". Those who reported that they had used a modern (see Hubacher and Trussell's

(2015) definition[26]) and reversible method of contraception were recoded as "yes" (1). Those who reported "refused", "don't know", or "none" were recoded as "no" (0). Those who indicated that they had used tubal ligation, hysterectomy or partner with a vasectomy (i.e. "permanent method users") were excluded from the outcome since the timing of their procedure was not reported and they were not considered to be at risk of becoming pregnant. A supplemental analysis was conducted to examine if citizenship was associated with type of method use (see Figure 3). This analysis was conducted using a six-level categorical variable of contraception method type used in the past 12 months (0=permanent method, 1=long-acting reversible method, 2=pill or other hormonal, 3=condom, and 4=other) (Eunice Kennedy Shriver National Institute for Child and Health Development, n.d.). Since the survey measure for type of contraception method used in the past 12 months allowed for multiple responses, the responses were recoded into the longest acting method type[27].

Independent variable(s). Nativity was assessed using the measure "in which country were you born?" (0=U.S.-born, 1=foreign-born). Then, foreign-born respondents were asked to indicate their citizenship status (naturalized citizen, non-citizen). Finally, non-citizens were asked to indicate if they had a green card. Citizenship status was recoded as three-level categorical variable (0=naturalized citizen, 1=legal permanent resident (LPRs) (non-citizen with a green-card), 2=non-citizen without a green card (e.g. undocumented immigrants, temporary visa holders, DACA recipients, or refugees and asylees)).

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26 Modern method of contraception is a product or medical procedure that interferes with reproduction from acts of sexual intercourse"—which included intrauterine devices and systems (IUD), subdermal implants, oral contraceptives (pill), condoms (male and female), injectables, emergency contraceptive pills, patches, diaphragms and cervical caps, and spermicidal agents (gels, foams, creams, suppositories, etc.), vaginal ring, and sponge (Hubacher & Trussell, 2015).
27 Recoded by the Data Access Center (DAC) at the UCLA Center for Health Policy Research (CHPR).

Race/ethnicity was assessed using a self-report measure which included the categories "Latino/Hispanic", "Non-Latino White", "Non-Latino Black or African American", "Asian", "American Indian", or "Alaska Native", "Other Pacific Islander", "Native Hawaiian", or "did not know" or "refused". This measure was recoded into a five-level categorical measure (0="Non-Latina (NL) White" (reference and modal category in the unweighted data), 1="Latina[28]", 2="NL Asian (included Pacific Islanders)", 3="NL Black", and "Other[29]").

Health insurance was examined using an item in which respondents indicated if they had health coverage through a "current or former employer/union", "school", "a professional association", "trade group or another organization", "purchased directly from a health plan", "Medicare", "Medi-Cal", "ChampUS/Champ-VA", "Tricare", "VA or some other military health care", "Indian Health Service", "Tribal Health Program", "Urban Indian Clinic", "Covered California", "some other government health plan", or "some other non-governmental health plan". Responses were first recoded[30] into a categorical variable with eight options including "uninsured", "Medicare & Medicaid", "Medicare & others", "Medicare only", "Medicaid", "employment-based", "privately purchased" and "other public". These categories were collapsed into a three-level categorical variable (0=uninsured, 1=public health insurance (i.e. Medicare & Medicaid", "Medicare & others", "Medicare only", "Medicaid", and "other public"; reference) and 2= private health insurance (i.e. "employment-based" and "privately purchased")).

Controls. I controlled for several sociodemographic factors that are known to be associated with contraception use including age (0=18-24, 1=25-34 (reference), 2=35-44), relationship status (0=never married, 1=married or cohabiting (reference), 2=divorced,

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28 This category also included those who identified as "Hispanic" or "Latino"
29 Included "American Indian and "Alaska Native", "Native Hawaiian", or individuals who identified as more than one non-Latino race.
30 Recoded by the Data Access Center (DAC) at the UCLA Center for Health Policy Research (CHPR).

separated, or widowed), household size (0=1-2, 1=3-4, 3= ≥ 5; used instead of parity since CHIS did not measure of parity), educational attainment (0=high school or less (reference), 1=some college, vocational/trades school/associate's degree, or 2-year junior college", 2= 4-year college or university (B.A. or B.S), and 3=graduate or professional school (M.S., M.A., PhD, or equivalent")), annual household income before taxes (0=$19,999 or less" (reference), 1=$20,000-$69,999, 2= $70,000-$135,000, 3= ≥ $135,000). For example, older women may be more knowledgeable about contraception and its importance compared to younger women, while younger women experience more challenges with SRH access (Subedi et al., 2018). Studies also report that women in less serious relationships are less likely to plan sexual intimacy and less prepared with protection (Glei, 1999). The financial burden of family planning services may also restrict contraception use for low income women (Bolatova & Law, 2019). To control for acculturation, which is positively associated with contraception use (Brown et al., 2003; J. Jones et al., 2012; M. E. Jones et al., 2002; Romo et al., 2004), I used the proxy measure of language spoken at home (1=speaks only English at home, 0=speaks no English or speaks both English and something else at home (reference); Abraído-Lanza et al., 2005; Cabassa, 2003; Lara et al., 2005). I could not control for parity, knowledge and attitudes related to contraception, partner communication related to contraception use, and fertility norms even though they are known to be associated with contraception use due to limitations of the data. I controlled for fertility preference by only including respondents who indicated that they were not planning to pregnant in the next year in the analytic sample.

Figure 2. Screening of final analytic sample for Aim 3

Adult sample 2017-2020 N = 86,439	Male N = 38,431
Female N = 48,008	Sex assigned at birth: Male N = 89
Sex assigned at birth: Female N = 47,919	≥ 45 years old N = 34,990
18-44 years old N = 12,929	Sexual orientation: Not Heterosexual N= 1,543
Sexual orientation: Heterosexual N = 11,357	Currently pregnant N = 374
Not currently pregnant N = 10,983	Plan to become pregnant N = 991
No plan to become pregnant N = 9,992	No sex partner(s) in the last 12 months N = 2,041
≥ 1 sex partner N = 7,951	No **male** sexual partner in the past 12 months N = 211
Male sexual partner in the past 12 months N = 7,740	Unable to become pregnant N = 575
At risk of becoming pregnant N = 7,165	Used a permanent method of contraception in the past 12 months N = 1,361
Final sample N = 5,804	

<u>Analysis</u>

First, I described the sociodemographic characteristics of the sample (Table 1). Then, I conducted Pearson chi-square tests to assess if there were significant differences in the sociodemographic, migration (i.e. nativity, citizenship status, years in the U.S., language spoken at home), and health characteristics (i.e. insurance status, usual source of care, and contraception use) of the sample by citizenship status (Tables 2) and race (Table 3). Pearson chi-square tests were used to examine if contraception use was associated with any sociodemographic, migration, or health characteristics (Table 4). Next, I conducted multivariate binomial logistic regressions to assess the effects of nativity, race/ethnicity, and health insurance status on contraception use in the past 12 months (Table 5). Then, among foreign-born, I estimated multivariate binomial logistic regressions of citizenship status, race/ethnicity, and health insurance status on contraception use in the past 12 months (Table 6). Then I estimated a stratified multivariate regressions of citizenship status on contraception use for Latina and Asian immigrants separately (Table 7). Pearson chi-square tests were used to assess if there were significant bivariate differences in type of contraception method used in the past 12 months by citizenship status (included U.S.-born citizens and reversible and permanent methods of contraception; Figure 3). A sensitivity analysis (Appendix I) was conducted to assess if there were differences between the analytic sample (contraception non-users and reversible method users) and the permanent method users who were excluded from the main analysis.

Results

<u>Sample characteristics</u>

The sample was 49% Latina, 28% White, 15% Asian, 4% Black, and 3% other race/ethnicity. Approximately 70% were U.S.-born citizens, 12% were naturalized citizens, 8%

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were LPRs, and 10.5% were non-citizens without a green card. Among foreign-born, about 56%

had lived in the U.S. for at least 15 years and 41% did not speak English in their home.

Approximately 60% were married or cohabiting with a partner, 30% had a large household size

($\geq$ 5) and 47% had at least a college degree. About 82% had a usual source of care, 9% were

uninsured, 31% had public health insurance, and 60% had private health insurance. Finally, 71%

were using contraception (Table 1).

Table 1. Sample characteristics of 18-44 year old cis-gender, heterosexual women who were at risk of becoming pregnant in the CHIS 2017-2020 (N=5,804)

	Weighted %	N
Age		
18-24	23.8	1,088
25-34	41.9	2,324
35-44	34.3	2,392
Race[a]		
NL White	28.4	2,388
Latina	48.7	2,240
NL Asian	15.4	722
NL Black	4.2	199
NL Other	3.3	255
Nativity		
U.S.-born	69.6	4,424
Foreign-born	30.4	1,380
Citizenship status[b]		
U.S.-born citizen	69.6	4,424
Naturalized citizen	12.2	669
Legal permanent resident	7.7	335
Non-citizen without green card	10.5	376
Years in the US[b]		
0-14 years	44.3	583
$\geq$ 15 years	55.7	797
Languages spoken at home[b]		
No English	41.4	482
English and something else	46.8	669
English only	11.8	229
Marital status		

Never married	36.8	1,927
Married or living with partner	58.2	3,505
Widowed/separated/divorced	5.0	372
Household size		
1-2	24.2	1,840
3-4	46.2	2,650
≥ 5	29.6	1,314
Educational attainment		
HS diploma/GED or less	29.1	1,143
Some college	23.9	1,533
College degree	30.8	1,936
Graduate degree	16.3	1,192
Annual household income		
$\leq$$19,999	15.3	723
$20,000-$69,999	37.2	2,023
$70,000-$135,000	27.5	1,717
$\geq$ $135,000	20.0	1,341
Survey year		
2017	27.8	1,440
2018	26.2	1,266
2019	23.0	1,444
2020	23.0	1,654
Type of current insurance		
Uninsured	9.2	442
Public health insurance	30.8	1,487
Private health insurance	60.0	3,875
Has usual source of care other than ED	81.6	4,853
Contraception use	71.2	4,223
Contraception method type used in the past 12 months		
None	28.8	1,581
IUD	18.2	1,186
Implant	6.1	313
Pill	22.7	1,351
Other hormonal	4.7	275
Condom	18.3	1,034
Other non-hormonal	1.2	64

Notes: a. Non-Latina (NL); b. Among foreign born (N=1,380); c. Reported frequencies (N) are unweighted, percentages are weighted population estimates.

<u>Bivariate findings</u>

Differences by citizenship status. Among U.S. born citizens, 37% were White, 44% were Latina, 9.5% were NL Asian, 6% were NL Black and 3% identified as other. Among naturalized citizens, 13% were NL White, 44.5% were Latina, 38% were NL Asian, and 2% were Black, and 3% identified as other. LPRs were 10% NL White, 58% Latina, 31% NL Asian, and 1% NL Black, and non- citizens without a green card were 2.5% NL White, 80% Latina, and 17% NL Asian ($p<0.001$). Among foreign-born, naturalized citizens had the highest prevalence of only speaking English at home (21%) compared to LPRs (8%) and non-citizens without a green card (7%; $p<0.001$). U.S.-born citizens had the lowest prevalence for large household size (25% vs. 35% naturalized citizen, 42% LPRs, 43% non-citizens without a green card; $p<0.001$), highest prevalence for graduate degree (17% vs. 16% naturalized citizens, 11% LPRs and 12% non-citizens without a green-card; $p<0.001$), and highest levels of contraception use (74% vs. 63% naturalized citizens, 63% LPR, and 70.5% non-citizens without a green card; $p<0.01$).

Differences by race. Approximately 91% of NL White were U.S.-born citizens, 6% were naturalized citizens, 3% were LPRs, and 1% were non-citizens without a green-card. About 62% of Latinas were U.S.-born citizens, 11% were naturalized citizens, 9% were legal permanent residents and 17% were non-citizens without a green card. NL Asians were 43% U.S. born-citizens, 30% naturalized citizens, 16% LPRs, and 12% non-citizens without a green card. Among NL Black, 92% were U.S.-born citizens, 5% were naturalized citizens, 2% were LPR, and 1% were non-citizens without a green card. Approximately 89% of NL Other were U.S.-born citizens, 10% were naturalized citizens, 0.5% were LPRs and 1% were non-citizens without a green card ($p<0.001$). Speaking only English at home was highest among foreign-born NL Black (59%) and NL White (41%), and lowest among Latinas (4%) and NL Asians (16%;

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p<0.001). Educational attainment of a college degree or more was most prevalent among NL Whites (62%) and NL Asians (69% vs. 30% of Latinas, 48% of NL Blacks, 56% of NL Other; p<0.001). Approximately 36% of NL Asians and 31% of NL Whites reported annual household income of $135,000 (vs. 9% of Latinas, 13% of NL Blacks, and 22% of NL Other (p<0.001). Latinas had the highest prevalence of being uninsured (13.5% vs. 5% NL White, 5% NL Asian, 6% NL Blacks, and 4% NL Other; p<0.001). Contraception use was lowest among NL Black women (56% vs. 68% Latina and NL Asian women, and 79% of NL White women; p<0.001).

Contraception use. Sociodemographic characteristics that were correlated with contraception use included age (74% 18-24 years, 76% 25-34 years, and 63% 35-44; p<0.001), race/ethnicity (79% NL White, 68% Latina, 68% NL Asian, 56% NL Black, 78.5% NL Other; p<0.001), household size (78% 1-2, 71% 3-4, 66% ≥ 5; p<0.01), educational attainment (66% high school/GED or less, 68% some college, 74% college degree, 81% graduate degree; p<0.01), and annual household income (62% ≤ $20,0000, 70% $20,000-$69,999, 74% $70,000-$134,999, 77% ≥ $135,000; p<0.001). Migration characteristics that were correlated with contraception use included nativity (66% foreign born, 74% U.S.-born; p<0.01) and time in the U.S. (71% in U.S. < 25 years vs. 61% in U.S. the U.S. ≥ 15 years; p<0.05). Health insurance status (62% uninsured, 65% public health insurance, 76% private health insurance; p<0.01) and having a usual source of (66% yes, 73% no) were also significantly correlated with contraception use.

Table 2. Weighted bivariate associations of sociodemographic, migration, and health access characteristics by citizenship status among 18-44 year old cis-gender, heterosexual women who were at risk of becoming pregnant in the CHIS 2017-2020 (N=5,804)

	All	U.S.-born citizen	Naturalized citizen	Legal permanent resident (LPR)	Non-citizen without a green card	p-value
	N=5,804	N=4,424	N=669	N=335	N=376	
	%	%	%	%	%	
Age						
18-24	23.8	28.3	16.6	10.5	11.5	
25-34	41.9	43.4	33.4	39.4	43.9	***
35-44	34.3	28.3	50.1	50.1	44.6	
Nativity						
U.S.-born	69.6	100.0				***
Foreign-born	30.4					
Race[a]						
NL White	28.4	37.0	13.0	9.6	2.5	
Latina	48.7	43.7	44.5	58.3	80.0	
NL Asian	15.4	9.5	38.2	31.0	17.0	***
NL Black	4.2	5.6	1.7	0.9	0.3	
NL Other	3.3	4.3	2.7	0.1	0.2	
Time in the U.S.[b]						
0-14 years	44.3		28.2	59.1	52.1	***
15 or more years	55.7		71.8	40.9	47.9	
Languages spoken at home[b]						
No English	41.4		21.5	44.0	62.6	
English and something else	46.8		57.2	48.1	33.8	***
English only	11.8		21.3	7.9	3.6	
Relationship status						
Never married	36.8	43.4	26.0	17.1	20.5	
Married or living with partner	58.2	52.4	66.1	78.7	72.7	***

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Widowed/separated/divorced	5.0	4.2	8.0	4.2	6.9	
Household size						
1-2	24.2	27.7	17.1	14.6	16.8	
3-4	46.2	47.1	48.0	43.5	40.0	***
≥ 5	29.6	25.2	34.9	41.9	43.2	
Educational attainment						
High school diploma/GED or less	29.1	22.0	26.0	49.9	64.8	
Some college	23.9	27.7	20.5	14.9	8.6	***
College degree	30.8	32.9	37.4	23.9	14.2	
Graduate degree	16.3	17.4	16.1	11.3	12.4	
Annual household income						
< $20,000	15.3	13.3	10.5	16.2	33.0	
$20,000-$69,999	37.2	34.7	35.5	50.1	46.6	***
$70,000-$134,999	27.5	31.3	26.9	20.2	8.9	
≥ $135,000	20.0	20.7	27.1	13.6	11.6	
Year of survey						
2017	27.8	26.8	27.3	33.7	30.1	
2018	26.2	25.7	25.3	30.0	28.4	0.390
2019	23.0	23.8	25.9	17.2	18.7	
2020	23.0	23.8	21.5	19.2	22.8	
Health insurance status						
Uninsured	9.2	6.8	8.9	11.2	24.2	
Public health insurance	30.8	27.9	25.1	41.7	49.0	***
Private health insurance	60.0	65.3	66.0	47.1	26.9	
Has usual source of care other than ED	81.6	83.2	82.6	83.4	68.7	***
Contraception use	71.2	73.7	62.9	62.7	70.5	**

Notes: a. Non-Latina (NL); b. Includes only foreign-born (N=1,380); c. Includes Associate's degree or vocational school; d. Reported frequencies (N) are unweighted, percentages are weighted population estimates; e. * p<0.05, ** p<0.01, *** p<0.001

Table 3. Weighted bivariate associations of sociodemographic, migration, and health access characteristics by race/ethnicity among 18-44 year old cis-gender, heterosexual women who were at risk of becoming pregnant in the CHIS 2017-2020 (N=5,804)

	Race[a]						p value
	All N=5,804	NL White N=2,388	Latina N=2,240	NL Asian N=722	NL Black N=199	NL Other N=255	
	%	%	%	%	%	%	
Age							
18-24	23.8	16.3	27.3	26.6	20.7	26.2	
25-34	41.9	47.1	39.7	38.3	41.6	47.1	**
35-44	34.3	36.6	33.0	35.1	37.7	26.6	
Nativity							
U.S.-born	69.6	90.9	62.4	42.7	92.4	89.2	***
Foreign-born	30.4	9.1	37.7	57.3	7.6	10.8	
Citizenship status							
U.S.-born citizen	69.6	90.9	62.4	42.7	92.4	89.2	
Naturalized citizen	12.2	5.6	11.1	30.2	5.1	9.7	***
Legal permanent resident	7.7	2.6	9.3	15.6	1.7	0.3	
Non-citizen without green card	10.5	0.9	17.3	11.6	0.8	0.8	
Time in the U.S.[b]							
0-14 years	44.3	47.6	37.6	57.1	55.7	38.3	**
15 or more years	55.7	52.4	62.4	42.9	44.3	61.7	
Languages spoken at home[b]							
No English	41.4	15.7	49.5	33.9	6.2	30.9	
English and something else	46.8	43.7	46.2	49.8	34.5	37.0	***
English only	11.8	40.6	4.3	16.3	59.4	32.1	
Relationship status							
Never married	36.8	28.9	38.0	40.6	57.5	43.7	
Married or living with partner	58.2	66.3	56.1	56.4	38.8	53.7	**

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Widowed/separated/divorced	5.0	4.8	5.9	2.9	3.6	2.6	
Number of people in the household							
1-2	24.2	36.0	15.7	24.9	28.8	39.2	
3-4	46.2	46.9	43.2	53.6	46.9	48.6	***
≥ 5	29.6	17.1	41.1	21.5	24.3	12.3	
Educational attainment							
High school diploma/GED or less	29.1	14.3	44.0	13.8	23.6	16.5	
Some college[c]	23.9	22.3	26.3	17.1	28.7	27.4	***
College degree	30.8	40.4	21.8	42.9	24.5	31.2	
Graduate degree	16.3	23.1	7.9	26.3	23.2	25.0	
Annual household income							
< $20,000	15.3	7.1	22.3	9.8	13.4	10.0	
$20,000-$69,999	37.2	26.7	46.8	24.2	45.3	36.9	***
$70,000-$134,999	27.5	35.4	22.0	29.6	27.8	31.5	
≥ $135,000	20.0	30.7	9.0	36.4	13.4	21.6	
Year of survey							
2017	27.8	27.9	26.0	34.1	26.5	24.1	0.150
2018	26.2	24.7	28.8	21.9	24.3	23.8	
2019	23.0	23.5	22.5	22.2	24.0	27.7	
2020	23.0	23.8	22.7	21.8	25.2	24.4	
Health insurance status							
Uninsured	9.2	5.3	13.5	5.3	5.8	3.7	
Public health insurance	30.8	14.3	43.8	18.3	37.1	31.2	***
Private health insurance	60.0	80.5	42.7	76.4	57.1	65.1	
Has a usual source of care other than ED	81.6	85.9	77.3	84.9	86.4	85.8	***
Contraception use	71.2	79.1	68.3	68.5	55.7	78.5	***

Notes: : a. Non-Latina (NL); b. Includes only foreign-born (N=1,380); c. Includes Associate's degree or vocational school; d. Sample size (N) are unweighted, percentages are weighted population estimates; e. * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 4. Weighted bivariate associations of contraception use by sample characteristics of 18-44 year old cis-gender, heterosexual women who were at risk of becoming pregnant in the CHIS 2017-2020 (N=5,804)

	Used a reversible method of contraception in the past 12 months	
	Weighted %	p-value
Age		
18-24	74.2	***
25-34	76.3	
35-44	62.8	
Race[a]		
NL White	79.1	***
Latina	68.3	
NL Asian	68.5	
NL Black	55.7	
NL Other	78.5	
Nativity		
U.S.-born	73.7	**
Foreign-born	65.5	
Citizenship status		
U.S.-born citizen	73.7	
Naturalized citizen	62.9	**
Legal permanent resident	62.7	
Non-citizen without green-card	70.5	
Time in the U.S.[b]		*
0-14 years	70.8	
≥ 15	61.2	
Language spoken at home[b]		
Not English	63.5	0.771
English and something else	67.3	
English only	65.1	
Marital status		
Never married	74.2	
Married or living with partner	69.6	0.264
Widowed/separated/divorced	67.1	
Household size		
1-2	77.9	**
3-4	70.7	
≥ 5	66.4	

Educational attainment		
High school diploma/GED or less	65.7	**
Some college[c]	68.1	
College degree	73.9	
Graduate degree	80.6	
Annual household income		
$\leq$ $20,000	62.0	***
$20,000-$69,999	69.7	
$70,000-$134,999	74.0	
$\geq$ $135,000	77.0	
Year		
2017	68.7	0.529
2018	72.3	
2019	71.6	
2020	72.5	
Health insurance status		**
Uninsured	62.4	
Public health insurance	65.0	
Private health insurance	75.7	
Has usual source of care other than ED		
Yes	65.5	*
No	72.5	

Notes: a. Non-Latina (NL); b. Among foreign born (N=1,380); c. Includes Associate's degree or vocational school; d. Sample size (N) are unweighted, percentages are weighted population estimates; e. * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Multivariate findings.

Contraception use and nativity. After adjusting for covariates, NL Black and NL Asian women had lower odds of contraception compared to White women (Table 5; Model 4: aOR_{Asian}: 0.62, OR_{Black}: 0.34; $p<0.001$). Additionally, those who were 25-34 years had lowered odds of contraception use, while having a graduate degree and income of 135,000 or more increased odds of contraception use (Table 5; Model 4: aOR_{25-34}: 0.52, $p<0.001$; $aOR_{gradute\ degree}$: 1.60, $p<0.05$; $aOR_{annual\ household\ income\ \geq\ \$135,000}$: 1.58; $p<0.05$).

Contraception use and citizenship status. After adjusting for other covariates, only age was significantly associated with contraception use in the past 12 months among foreign born

women (Table 6, Models 1-3). Stratified analysis (Table 6, Models 4-7) also indicated that those

aged 35-44 years had lower odds of contraception use compared to those who were 18-24 years,

net of other factors. Though not significant, after adjusting for covariates, NL Asians who were

non-citizens without a green-card had nearly twice the odds of contraception use compared to

naturalized citizens (Model 7; aOR: 1.95; p>0.05). Those who were uninsured also had twice the

odds of using contraception in the past 12 months, net of other factors (Model 7, aOR: 2.03;

p>0.05).

Table 5. Weighted binomial logistic regression of contraception use among 18-44 year old
cis-gender, heterosexual women who were at risk of becoming pregnant in the CHIS 2017-
2020 (N=5,804)

	Model 1	Model 2	Model 3	Model 4
	N=5,804	N=5,804	N=5,804	N=5,804
	OR (s.e.)	OR (s.e.)	OR (s.e.)	OR (s.e.)
Foreign-born (ref. U.S.-born)		0.954	1.026	1.052
		(0.143)	(0.164)	(0.177)
Race[a] (ref. NL White)				
Latina			0.805	0.829
			(0.123)	(0.128)
NL Asian			**0.624***	**0.617***
			(0.117)	(0.116)
NL Black			**0.336*****	**0.344*****
			(0.0871)	(0.0877)
NL Other			0.940	0.958
			(0.263)	(0.266)
Health insurance status (ref. public health insurance)				
Uninsured				0.833
				(0.309)
Private health insurance				1.277
				(0.253)
Controls				
Age (ref. 25-34)				
18-24	1.006	1.002	1.005	1.002
	(0.174)	(0.176)	(0.181)	(0.183)
35-44	**0.517*****	**0.520*****	**0.525*****	**0.521*****

	(0.0686)	(0.0668)	(0.0685)	(0.0673)
Marital status				
(ref. Married or living with partner)				
Never married	1.105	1.098	1.196	1.209
	(0.187)	(0.190)	(0.211)	(0.211)
Widowed/separated/divorced	1.112	1.111	1.108	1.137
	(0.327)	(0.326)	(0.311)	(0.360)
Household size (ref. ≥ 5)				
1-2	1.201	1.200	1.176	1.149
	(0.190)	(0.190)	(0.194)	(0.184)
3-4	0.995	0.995	0.992	0.985
	(0.158)	(0.157)	(0.159)	(0.150)
Educational attainment				
(ref. High school diploma/GED or less)				
Some college[b]	0.874	0.866	0.877	0.847
	(0.201)	(0.209)	(0.213)	(0.215)
College degree	1.069	1.064	1.088	1.015
	(0.244)	(0.250)	(0.266)	(0.255)
Graduate degree	**1.643****	**1.633***	**1.748****	**1.603***
	(0.314)	(0.322)	(0.347)	(0.320)
Annual household income (ref. < $20,000)				
$20,000-$69,999	1.329	1.329	1.334	1.287
	(0.216)	(0.216)	(0.209)	(0.200)
$70,000-$134,999	**1.496***	**1.492***	**1.477***	1.332
	(0.289)	(0.287)	(0.271)	(0.247)
≥ $135,000	**1.796****	**1.796****	**1.776****	**1.578***
	(0.329)	(0.329)	(0.341)	(0.347)
Speaks only English at home	**1.344***	**1.318***	1.298	1.281
	(0.186)	(0.175)	(0.195)	(0.192)
Survey year (ref. 2017)				
2018	1.194	1.193	1.168	1.165
	(0.210)	(0.210)	(0.205)	(0.209)
2019	1.077	1.076	1.070	1.069
	(0.172)	(0.172)	(0.172)	(0.176)
2020	1.117	1.116	1.114	1.108
	(0.166)	(0.166)	(0.167)	(0.170)
Constant	**1.594***	**1.644***	**1.976***	**1.931***
	(0.311)	(0.383)	(0.603)	(0.571)

Notes: a. Non-Latina (NL) b. Includes vocational training or Associate's Degree; Standard error in parentheses; c. Analyses are weighted to the population projections; d. *** $p<0.001$, ** $p<0.01$, * $p<0.05$.

Table 6. Weighted binomial logistic regression of contraception use by citizenship status among foreign-born 18-44 year old cis-gender, heterosexual women who were at risk of becoming pregnant in the CHIS 2017-2020 (N=1,380)

	All			Latina		NL Asian[a]	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
	N=1,380	N=1,380	N=1,380	N=734	N=734	N=403	N=403
	OR (s.e.)	OR (s.e.)	OR (s.e.)	OR (s.e.)	OR (s.e.)	OR (s.e.)	OR (s.e.)
Citizenship status (ref. naturalized citizen)							
Legal permanent resident	1.002	1.015	1.019	1.049	1.049	0.820	0.836
	(0.233)	(0.242)	(0.245)	(0.441)	(0.446)	(0.354)	(0.362)
Non-citizen without green card	1.455	1.375	1.396	1.228	1.236	2.092	1.953
	(0.387)	(0.372)	(0.404)	(0.516)	(0.548)	(1.183)	(1.097)
Race[a] (ref. NL White)							
Latina		1.217	1.227				
		(0.419)	(0.426)				
NL Asian		0.745	0.744				
		(0.275)	(0.275)				
NL Black		0.379	0.377				
		(0.311)	(0.306)				
NL Other		1.969	1.988				
		(1.674)	(1.693)				
Health insurance status (ref. public health insurance)							
Uninsured			0.948		0.924		2.029
			(0.414)		(0.441)		(2.029)
Private health insurance			1.036		0.969		1.310
			(0.329)		(0.393)		(1.008)
Controls							
Age (ref. 18-24)							
25-34	0.828	0.891	0.899	0.688	0.692	0.737	0.741

	(0.346)	(0.400)	(0.414)	(0.356)	(0.359)	(0.662)	(0.696)
35-44	0.415***	0.407***	0.408***	0.404**	0.405**	0.341*	0.338*
	(0.0967)	(0.0949)	(0.0964)	(0.125)	(0.128)	(0.164)	(0.164)
Relationship status (ref. Married or living with partner)							
Never married	0.781	0.769	0.767	0.803	0.798	0.604	0.583
	(0.224)	(0.225)	(0.226)	(0.305)	(0.312)	(0.402)	(0.392)
Widowed/separated/divorced	0.650	0.640	0.643	0.618	0.617	0.370	0.399
	(0.254)	(0.252)	(0.256)	(0.346)	(0.351)	(0.415)	(0.456)
Household size (ref. ≥ 5)							
1-2	1.220	1.243	1.235	1.249	1.253	1.637	1.596
	(0.398)	(0.419)	(0.411)	(0.580)	(0.596)	(1.026)	(0.992)
3-4	1.068	1.078	1.077	1.018	1.019	1.037	1.022
	(0.345)	(0.361)	(0.359)	(0.400)	(0.401)	(0.675)	(0.651)
Educational attainment (ref. High school diploma/GED or less)							
Some college[b]	0.886	0.909	0.905	0.894	0.899	0.999	1.088
	(0.326)	(0.355)	(0.363)	(0.480)	(0.501)	(0.956)	(1.134)
College	0.767	0.900	0.894	1.088	1.100	0.599	0.608
	(0.307)	(0.445)	(0.461)	(0.841)	(0.889)	(0.444)	(0.484)
Graduate degree	1.154	1.443	1.424	1.302	1.314	1.057	1.113
	(0.422)	(0.555)	(0.570)	(0.938)	(0.945)	(0.912)	(1.073)
Annual household income (ref. < $20,000)							
$20,000-$69,999	1.438	1.431	1.432	1.346	1.353	1.555	1.460
	(0.391)	(0.395)	(0.401)	(0.472)	(0.475)	(1.341)	(1.290)
$70,000-$134,999	1.467	1.532	1.515	1.289	1.300	1.729	1.465
	(0.491)	(0.533)	(0.578)	(0.571)	(0.622)	(1.639)	(1.533)
$\geq$ $135,000	1.987	2.175	2.144	1.499	1.512	2.560	2.241
	(0.837)	(1.005)	(1.067)	(0.903)	(0.924)	(2.695)	(2.595)

Speaks only English at home	0.955	1.013	1.019	0.792	0.799	1.741	1.689
	(0.321)	(0.348)	(0.346)	(0.426)	(0.420)	(1.023)	(0.980)
Survey year (ref. 2017)							
2018	1.407	1.344	1.344	1.235	1.237	2.936	2.975
	(0.416)	(0.402)	(0.401)	(0.451)	(0.455)	(2.119)	(2.186)
2019	1.438	1.390	1.391	1.968	1.977	0.982	0.916
	(0.393)	(0.385)	(0.379)	(0.755)	(0.747)	(0.537)	(0.542)
2020	1.412	1.363	1.360	1.327	1.331	1.586	1.514
	(0.360)	(0.350)	(0.345)	(0.415)	(0.419)	(0.937)	(0.934)
Constant	1.645	1.503	1.484	2.076	2.097	1.273	1.133
	(0.706)	(0.774)	(0.783)	(1.130)	(1.150)	(1.465)	(1.347)

Notes: a. Non-Latina (NL); b. Includes those with Vocational training or Associate's degree; c. Standard error in parentheses; d. Analyses are weighted to the population projections; e. *** p<0.001, ** p<0.01, * p<0.05


Figure 3. Weighted prevalence of type of contraception use by citizenship status among 18-44 year old cis-gender, heterosexual women in California who did not intend to become pregnant in the next year in the CHIS 2017-2020 (N=7,165)

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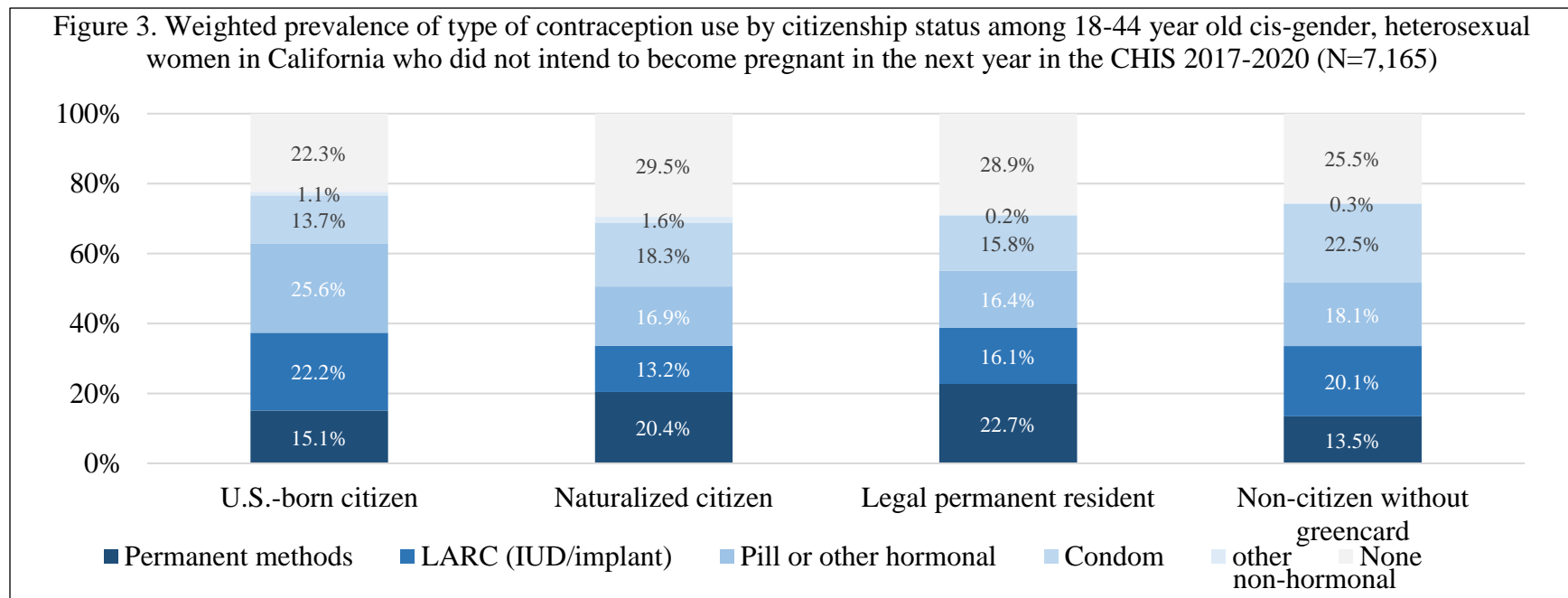
Supplementary analysis. There were significant bivariate differences in the type of contraception method used in the past 12 months by citizenship status (N=7,165) (Figure 3). Permanent method use was highest among LPRs (23% vs. 20% naturalized citizens, 15% among U.S. born-citizens, and 13.5% among non-citizens without a green card. LARC use was most prevalent among U.S. born citizens (22% vs. 20% non-citizens without a green-card, 16% LPRs, and 13% naturalized citizens). Use of pill or other hormonal methods was lowest among LPRs (16%) and naturalized citizens (17% vs. 18% of non-citizens without a green card and 26% of U.S.-born citizens). Finally, condom use was highest among non-citizens without a green-card (23% vs. 16% LPRs, 18% naturalized citizens, and 14% U.S.-born citizens; p<0.001).

Discussion

This study explored the role of nativity and citizenship status on contraception use and if association differed by race/ethnicity. I found that 71% of 18-44 year old, sexually active cis-gender, heterosexual women in California who were at risk of becoming pregnant had used contraception in the past 12 months. After adjusting for other covariates, nativity was not associated with contraception use in the past 12 months, and among immigrants, citizenship status was not associated with contraception use in the past 12 months. Although citizenship status was not associated with contraception use, there were notable bivariate differences in *type* of contraception method used in the past 12 months.

Overall, contraception use within this sample was higher than national levels of contraception use among females 18-49 year old who are sexually active (65%) (Frederiksen et al., 2022). The findings on nativity and contraception use in this study differ from national-level data from the National Survey for Family Growth (NSFG) which reports that foreign-born women are significantly less likely than U.S.-born women to use contraception in the last month

net of age, socioeconomic status, relationship status, urbanicity, age at first sex, parity, and

health insurance (Tapales et al., 2018b). Though nativity and citizenship status was not

associated with contraception use, this may reflect the positive impacts of California policy

climate for immigrants and reproductive health access, especially when compared to most other

states (Brooks et al., 2018; *Medi-Cal Expansion Provided 286,000 Undocumented Californians*

With Comprehensive Health Care, 2022). For example, California's state-funded public health

insurance plans including Medi-Cal and Family PACT may enable immigrants, including

eligible undocumented immigrants, to access care and obtain contraception at low or free cost

(Frost et al., 2021; *Family PACT*, n.d.). In fact, one study reported that unlike undocumented

immigrant in other states, undocumented immigrants in San Francisco have reported abilities to

overcome barriers to care since the city offers them universal healthcare access regardless of

immigration status (Marrow, 2012). Data from this study also focuses on contraception use from

2017 to 2020, which reflects a period following the Affordable Care Act (ACA), which reduced

out-of-pocket spending for contraception, eliminating some cost-related barriers (Becker &

Polsky, 2015). Even recent reports from NSFG have used data from 2006 to 2015 which includes

data that may have predated the potential benefits that the ACA had on contraception access.

Citizenship status was not significantly associated with contraception use after adjusting

for other covariates. In California, certain subgroups of non-citizens, including DACA recipients

or temporary visa holders who were included within the group of non-citizens without a green

card, may have had better access to social and health resources compared to their non-DACA or

other undocumented counterparts (Gonzales et al., 2018). Additionally, immigrants who are

unable to obtain healthcare coverage may still be able to access contraception through

community health organizations or publicly-funded SRH clinics where they do not have to

disclose their citizenship status (Frost et al., 2021a), or through the informal health sector such as stores that have offered access to less-effective contraception methods.

The null association between citizenship status and contraception use observed in this study persisted even after stratifying the analysis by race/ethnicity. This may relate to the racialized nature of immigrant enforcement practices in the U.S. which, as written, claim to be "race-neutral", but disproportionately target immigrants of color, and as result, have had a "chilling effect" on immigrants even if they are documented or citizens (Aranda et al., 2014; Asad & Clair, 2018; Barillas, 2014; Gómez Cervantes, 2021; Menjívar, 2021). These analyses also indicated that among foreign-born Latinas and Asian, non-citizens had higher odds of contraception use compared to naturalized citizens (not significant, however). This challenges the harmful and highly popularized stereotype that undocumented immigrants come to the U.S. to have children on U.S. soil, otherwise known as "anchor babies", in order to circumvent the immigration system, secure legal status, and stall deportation action against their immediate family members, since they now fall under the protective force field of the baby's legal citizenship status (Canzater, 2018). This study suggests that Latina non-citizens who did not have a green-card may be trying to delay or prevent pregnancy, potentially due to the instability of their citizenship status. One study of undocumented Latina women in Ohio even reported that almost 40% were "very sure" that they did not want to have more children and 90% believed in using contraception (Thomas & Igram, 2023). Future studies should leverage existing data on undocumented immigrants, such as the UCLA-based study Building community, Raising All immigrant Voices for health Equity (BRAVE) study to investigate how immigration status may shape pregnancy intentions and decisions to use contraception (*Our Studies*, n.d.).

Among Asian Americans, null association between citizenship status and contraception may have different implications. Asian Americans, particularly Chinese, Indian, Japanese, and South Koreans, who are non-citizens without a green card may be temporary visas holders and makeup a large share of students in higher education and high earning industries (Batalova, 2022). In fact, within this sample, Asian Americans were among the most highly educated and highest earning group. Studies report that this type of educational advantage is also associated with delaying childbearing and parenthood (Edin & Kefalas, 2005). Within this sample, Asian non-citizens may be taking steps to delay childbearing including contraception use. "Birth tourism" policy alerts, which were issued toward the end of the Trump administration, also denied visitor (B) visas to any applicants suspected of traveling for the sole purpose of giving birth in the U.S., which also may have discouraged non-green card holders from becoming pregnant ("Pregnant Women Denied Visitor Visas," n.d.). Future studies should continue to explore the mechanisms behind immigrant women's decisions to use contraception, especially among immigrant women of less citizenship statuses.

Finally, this study indicated that non-citizens without a green card had the highest prevalence of condom use, suggesting that to access contraception, immigrants do not necessarily need to interact with the formal healthcare system or require health insurance. This is similar to a study that found that condoms were the most popular contraception choice among refugees in Canada (Aptekman et al., 2014).

Limitations

This study had several limitations. First, due to the use of cross-sectional data, no causal claims can be made from this study. Immigrants with insecure or unauthorized statuses may have also been harder to reach due to safety concerns. UCLA CHPR took several measures to ensure

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an inclusive sample, including a sampling frame which included residents of small, hard to reach counties, oversampling of a diverse pool of racial and ethnic minorities (Leyser-Whalen & Berenson, 2013), and data collection in six different languages (California Health Interview Survey, 2017c; 2019c). The survey waves in this study also had low response rates, suggesting a compromised data quality due to selectivity and response bias. However, the UCLA CHPR has reported that after adjusting for selection probability and controlling for demographic characteristics, CHIS estimates do not demonstrate significant bias due to nonresponse (California Health Interview Survey, 2007). There were also some limitations to the measures used for the eligibility criteria including pregnancy intentions and the dependent variable of type of contraception method use in the past 12 months. Pregnancy intention question was assessed as a single response item with choices that included "do not plan to get pregnant within the next 12 months", "not sexually active", "are planning to get pregnant within the next 12 months, "are currently pregnant", "refused" and "don't know". The single response option made it unclear if women fell into more than one of these categories. Still, this study integrated a conservative analytic sample for women who were not planning to become pregnant but were potentially at risk. Additionally, write-in responses for "other" contraception use were inaccessible. However, a meticulous review and recoding process conducted by the UCLA CHPR ensured that these write-in responses were recoded into the appropriate category in the publicly available and restricted data. Additionally, due sample size limitations, I could only examine racial/ethnic differences in the effects of citizenship on contraception use among Latina and Asian immigrants. Future studies on citizenship status and health should aim to recruit adequate samples of immigrants who self-report their race as Black and White and immigrants from other race/ethnic backgrounds that are underrepresented in health data. This would allow researchers

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to examine the effects of citizenship status on health among immigrant populations that are underrepresented in health data such as Middle Eastern and North African immigrants who have grown in presence in the U.S. over the several decades, may have insecure citizenship statuses as temporary visa holders or refugees and asylees, and are often categorized into the White racial/ethnic even though it does not accurately represent them (Abboud et al., 2019; Abuelezam et al., 2018). Finally, due to data limitations with CHIS, I could not control for some important factors that are known to affect contraception use, including parity, knowledge and attitudes related to contraception, partner communication related to contraception use, and fertility norms. Despite these limitations, because of its unique measures of citizenship status and SRH service utilization, CHIS was the best data source for this study (Tapales et al., 2019).

Future research should investigate how government-imposed barriers and facilitators can shape U.S.- and foreign-born contraception decision-making, access, and use. For example, while there may be federally imposed barriers to health access, California has implemented multiple programs, like Medi-Cal, Family PACT, Covered California, and continues to expand healthcare coverage to ensure SRH access regardless of immigration status. It is also critical to conduct deeper investigations of how individual (e.g., race/ethnicity, age, sexual orientation) and contextual factors (e.g. regional context) influence contraception use among immigrant women of differential citizenship statuses.

Advancing immigrant women's contraception use, SRH, and the well-being of families and communities would require action from policymakers, including bettering protections for publicly-funded family planning providers, lifting barriers to healthcare access such as eligibility requirements of Medicaid or CHIP that are based on citizenship status or years of residency, and a commitment to creating a more inclusive policy climate toward immigrants. Policymakers can

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also support community health organizations conduct outreach within immigrant networks to inform them of their eligibility for health services and importance of obtaining SRH. Advancing immigrant women's SRH through reform of federal and state immigration policies would be a step toward promoting the health and rights of all individuals.

Chapter 9: Discussion

Summary and implications

As demographic trends in the country change, it has become critical for researchers to understand factors which shape the health of populations who are underrepresented in health literature, including immigrants. In Aim 1 and Aim 2 of this dissertation, I explore this within MENA and South Asian Americans and in Aim 3, I do this among immigrants in California with respect to their citizenship status.

Aim 1 indicated that MENA and South Asians have established prominent ethnic networks, mostly in separate geographies. This may reflect the history of their migration to the U.S. or even racial tensions between these two groups. For example, South Asian ethnic neighborhoods in the Bay Area may date back to when Punjabi immigrants established communities in San Francisco in the early twentieth century (*Echoes of Freedom: South Asian Pioneers in California, 1899-1965*, 2020) while the strong presence of MENA Americans in southern California may stem back to Iranian communities of West Los Angeles that emerged in the 1960s and 1970s (Auyoung, 2010; Etehad, 2019; Montagne, 2006). Additionally, geographic distance in MENA and South Asian ethnic neighborhood locations may be a consequence of social hierarchies related to race and ethnicity that are rooted in the sending context and also reproduced in the host society (Anitha & Pearson, 2013). At times, MENA and South Asian did

live in overlapping areas, but this may reflect a newer demographic trends in which large foreign-born communities are emerging in non-traditional, suburban areas (Walton, 2015).

The different neighborhood context that MENA and South Asians live in, according to the ethnic neighborhood typology that was developed in Aim 1, may also have implications for differences in social and economic mobility and health access in the new host society within these ethnic groups. For example, MENA and South Asians who have higher levels of socioeconomic status may be in neighborhoods that are also socioeconomically advantaged and equipped with institutional and health resources which enable them to develop social capital and have less exposure to discrimination (Veenstra et al., 2005). In this dissertation, I could not directly measure social capital or discrimination; however, I did find that advantaged integrated neighborhoods had the highest levels of MENA Americans who were U.S. born citizens, spoke English well or only English, lived in the U.S. for 15 years or more, had at least a college education, health insurance and private health, and lower levels of living below the federal poverty level (FPL). Similarly, among South Asians, advantaged integrated neighborhoods had higher prevalence of high household income, speaking English well or only English, and lower levels of living below the FPL. South Asians who lived in advantaged immigrant neighborhoods also had more college graduates, individuals with health insurance, and individuals with private health insurance. The neighborhood contexts that MENA and South Asians live in may also allude to variations in these groups social and economic mobility and successful integration within the host society. Further studies could explore the extent to which these neighborhood contexts are associated with social cohesion, discrimination and related health issues as well as other health outcomes.

Aim 2 indicated that neighborhood characteristics including geographic classification and city/non-city context, co-ethnic density, foreign-born density, and socioeconomic status were important predictors of health insurance status among MENA and South Asian Americans. This study supports contemporary scholarship on ethnic neighborhoods, which posits that there is not one straightforward path through which the neighborhood impacts immigrant health access (Small & Feldman, 2011). Rather, distinct neighborhood contexts among MENA and South Asians and the associations between neighborhood context and health insurance status may indicate that immigrants face different degrees of inequity when it comes to accessing healthcare. In fact, because this study assessed the ethnic neighborhood as more than just a "residential ethnic concentration", it allowed for a more complex understanding of the socioeconomic and social benefits (or disadvantages) that come with living in a co-ethnic neighborhood.

Finally, variations in MENA and South Asian neighborhood context suggested that as the MENA and South Asian populations in the U.S. have grown, the demographic profile of the U.S. has also changed in response to increased immigration from these regions. Future work should challenge conventional theories on immigrant assimilation and integration and be revised to capture how immigration has changed the nation's landscape in terms of race, ethnicity, gender, age, and socioeconomic status (Vertovec, 2007). The few scholars that have conducted research in this area have developed new concepts like hyperdiversity and spatialization, to explain ways that racial and ethnic minorities may be converging with one another instead of along Black-White racial dichotomies (Zhou & DiRago, 2023). This is the only known study that has attempted to examine these concepts with respect to MENA and South Asian Americans and is an early contribution to understanding hyperdiversity and spatialization among MENA and South Asian Americans.

Aim 3 focused on immigrant women of reproductive age who are known to face barriers to SRH care as result of immigration policies and reproductive health policies (Hasstedt et al., 2018a). The analysis indicated that 71% of sexually active, cis-gender, heterosexual reproductive-aged women in California who were at risk of becoming pregnant had used a reversible method of contraception in the past 12 months, which is higher than national prevalence of contraception use in the U.S. (65%) (Frederiksen et al., 2022). Additionally, neither nativity nor citizenship were associated with contraception use in the past 12 months. However, there were notable bivariate differences in *type* of contraception method used in the past 12 months. The findings on nativity and contraception use in this study differ from national-level data from the National Survey for Family Growth (NSFG) which reports that foreign-born women are significantly less likely than U.S.-born women to use contraception in the last month net of age, socioeconomic status, relationship status, urbanicity, age at first sex, parity, and health insurance (Tapales et al., 2018b). This, however, may be capturing some of the positive impacts of healthcare expansions within California which is working toward making healthcare accessible to immigrants regardless of their citizenship status (Brooks et al., 2018; *Medi-Cal Expansion Provided 286,000 Undocumented Californians With Comprehensive Health Care*, 2022). For example, California offers state-funded public health insurance plans including Medi-Cal and Family PACT which enable immigrants, including eligible undocumented immigrants, to access care and obtain contraception at low or free cost (Frost et al., 2021; *Family PACT*, n.d.).

The null association between citizenship status and contraception use in this study may also relate to the racialized nature of immigrant enforcement practices in the U.S.. That is, though they do not target a specific race or ethnic group as written, immigration policies have

had spillover effects on immigrants of color even if they are of a secure legal or citizenship status (Asad & Clair, 2018). In fact, according to the Current Population Survey, long-term permanent residents, who are typically eligible for public assistance programs and healthcare, often respond to enactment of punitive policies by not enrolling in Medicaid (Watson, 2014). Furthermore, due to their limited options for employment and material resources (Philbin et al., 2018), immigrants with insecure citizenship or legal status may be more intentional and proactive about preventing an unintended pregnancy. One study of undocumented Latina women in Ohio reported that almost 40% were "very sure" that they did not want to have more children and 90% believed in using contraception (Thomas & Igram, 2023). Researchers should build capacity for engaging in research with undocumented immigrants in ways that preserve their safety and ensure their trust. There are a few examples of this area of research, including the UCLA-based study Building community, Raising All immigrant Voices for health Equity (BRAVE) study which is a study of health and healthcare access among young undocumented Latinx and Asian adults in California (*Our Studies*, n.d.) and the Research on Immigrant Health and State Policy (RIGHTS) Study (*About the Study*, n.d.).

Challenges and limitations

The studies in this dissertation had some challenges and limitations. First, no causal claims can be drawn from each study within this dissertation since they used cross-sectional data. However, the use of population-level demographic data including the American Community Survey (ACS; Aims 1 and 2) and the California Health Interview Survey (CHIS; Aim 3), suggest strong reliability and generalizability at the state level. Another limitation of Aim 1 and Aim 2 was that the ACS did not have an explicit measure for MENA and South Asian race/ethnicity. In fact, one of the greatest challenges of this dissertation was defining who *is* MENA and

South Asian American. Grassroots organizations have attempted to address this question by pushing for better representation of MENA and South Asian populations in Census data and other national surveys. For example, the 2020 Census added an indicator of MENA descent, though they did not add a MENA category in their race/ethnicity measures. Other groups have used the decolonialized title of "South West Asians and North Africans (SWANA)" to identify as immigrants from these regions based on their collective opposition to "white supremacy, imperialism, heteropatriarchy, and capitalism". The SWANA designation includes "Kurds, Nubians, Sudanese, Armenians, Circassians, Arabs, Iranians, Druze, Assyrians, Chaldeans, Turks, Yazidis, Azeris, Turkmen, Afghans, Copts, Imazighen and other identities" (*What Is SWANA?*, n.d.). This definition is still vague, however, and requires a deeper understanding of each groups' ethnic identity and the historical context that brings them together. In this dissertation, I used indicators of country of birth and parents' country of birth to identify my sample, and could only include were first- or second-generation MENA and South Asian Americans. This way of identifying MENA and South Asians in my sample was in line with methods that have been used in prior research (Abuelezam et al., 2018).

Another challenge in Aim 1 and Aim 2 was the development of the measure for neighborhood context. Prior studies that examine neighborhood context have used unclear definitions and inconsistent measures of the neighborhood (Walton, 2012). Researchers, however, generally recognize that there is no "perfect" way to measure spatial and residential context, and instead researchers should focus on defining the spatial context in their studies based on what is relevant to the health outcome of interest and has a sound theoretical justification (Diez Roux & Mair, 2010; Macintyre et al., 2002; Roux, 2001). In this dissertation, I operationalized neighborhood context using aggregated census-derived individual social and

socioeconomic variables and used them as indicators of the social and economic conditions of the neighborhood. These indicators were selected through an informed process which integrated various theories from the immigrant assimilation literature and with consideration of the health outcome. Still, because so many measurement techniques exist throughout the literature on neighborhood context and immigrant health, it is hard to draw comparisons and general conclusions across studies. In employing methods used by Walton (2015) in her examination of Asian American neighborhoods within California, I was able to develop a strong justification for my definition and operationalization of the ethnic neighborhood and have a reference for comparing the neighborhood patterns of MENA and South Asian Americans with other immigrant groups. Finally, although my theoretical model asserted that the neighborhood context shaped healthcare access through social capital and protection from discrimination, due to lack of measures, I could not explore the role of social capital and discrimination on MENA and South Asian American healthcare access in Aim 2. Future work should attempt to capture the role of social capital and discrimination when examining the role of the neighborhood on health care access in immigrant communities.

There were also some limitations to Aim 3. First, the SRH and contraception measures included in CHIS were limited such that there were no questions in the survey related to reproductive decision-making, fertility norms, or knowledge, attitudes, or beliefs related to contraception. This is concerning because the decision to use contraception may be multifaceted and consider one's personal preferences, interpersonal factors (e.g. communication with intimate partners), and overall beliefs and knowledge about contraception. I also could not explore how citizenship status interacted with other factors that are relevant to reproductive decision-making.

Finally, in Aim 3, the measure of citizenship status had some limitations. First, while citizenship status was used as a measure of structural level barriers for immigrant women's contraception use, it may also indicate the extent to which an individual is socially, culturally, politically, or civically acculturated, all of which are factors that could shape one's decision to use contraception. Finally, the measure of citizenship status in the 2017-2020 waves of CHIS did not differentiate between the different kinds of non-citizens who did not have a green card, such as undocumented, temporary visa holders, refugees and asylees, or DACA recipients. Each of these statuses imply different levels of healthcare access, which could shape contraception use. Therefore, assessing non-citizens without a green card as one category may dilute the role of a certain insecure citizenship status on contraception. Future work should account for these differences.

Policy recommendations

This dissertation supports several key policy recommendations. First, when it comes to MENA and South Asian Americans, policymakers must revisit past conceptualizations and practices (or lack thereof) for MENA and South Asian race/ethnicity in existing health data and even consider shifting toward categories that are in line with migration experiences. For example, the experience of immigration has been identified as a social determinant of health (Castañeda et al., 2015), and among MENA and South Asians this includes their prior history of living under colonial regimes, migrating to escape war and conflict or for educational and employment opportunities, and living in an Islamophobic sociopolitical climate (Misra et al., 2021). These factors may translate into their neighborhood contexts. Researchers should continue to explore the lived experiences of immigrants look across racial and ethnic lines and use these to develop new ways to assess health disparities in these populations.

In addition to paying attention to similarities that cut across racial and ethnic lines, policy makers should also recognize how ethnic neighborhoods highlight the geographic and socioeconomic diversity among MENA and South Asian Americans. That is, these groups may experience heterogeneity in terms of the health challenges they face and the resources that are available to them because of the community in which they reside. Spatial factors, like neighborhood context and inequalities, should be a key dimension that are considered when exploring MENA and South Asian health. Finally, policymakers and researchers should expand their research on the health of MENA and South Asian Americans to those who are located in their *new* immigrant gateways including small and mid-size cities that have served as receiving communities for recent immigrants. Immigrants in these new receiving contexts may face unique challenges when accessing healthcare, including lack of or reduced access to community-based, safety-net healthcare providers that have been integral in providing health and social services to immigrants in larger cities (Ackert et al., 2021).

Advancing immigrant women's contraception use and other SRH services requires action from policymakers to implement better protections for publicly funded family planning providers and lifting eligibility requirements on healthcare that are based on citizenship, legal status, or years of residency. As of July 2023, at least 20 states, including California, extended coverage to pregnant women regardless of immigration status through the CHIP unborn child option and other state funding. Seven states, including California, Illinois, Maryland, Massachusetts, Minnesota, Rhode Island, and Washington, have also made state funding and CHIP health services available to immigrant women who are up to 12 months postpartum regardless of their immigration status (Kaiser Family Foundation, 2023). Other states should commit to creating a more inclusive policy climate toward immigrants and extend access to state-based health

insurance programs regardless of immigration status. Future work should also address how policymakers can support community health organizations with outreach within their immigrant networks so that these communities can be better informed about their eligibility for health services and importance of obtaining SRH. Advancing immigrant women's SRH through reform of federal, state, and local policies would be a step toward promoting reproductive justice and health of all individuals.

Future directions

This dissertation offers a foundation for future research in immigrant health and sexual and reproductive healthcare access. First, Aim 1 and Aim 2 bring into question existing racial and ethnic categorization for MENA and South Asian Americans. Future work should work on developing a clear and consistent definition of MENA and South Asian race/ethnicity or if there are other ways to understand health inequities within these groups based on their migration experiences. Future studies should also explore if it is better to examine the experience of certain MENA and South Asian American ethnic groups subgroups separate from the whole, especially if they are overrepresented in certain socioeconomic brackets relative to other MENA and South Asian subgroups or even overresponded in health data (e.g. Indian Americans who are both overwhelmingly the largest group of South Asians in the U.S. and in higher socioeconomic brackets than other South Asians (Asian American Federation, 2019)). Additionally, future research should investigate if the social construction of race, caste, and class from the sending nation are relevant to understanding construction of MENA and South Asians race/ethnicity and their resettlement contexts in the host society.

Future studies should also use the ethnic typology used in this dissertation to assess other health outcomes, including mental health, maternal health, and SRH outcomes using data sources

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that can be merged with ACS, including CHIS, the National Health Interview Survey, Current

Population Survey, and birth data from the National Center for Health Statistics (Tapales et al.,

2019). Researchers could also consider alternative measures of neighborhood context, such as

the recently developed IPUMS measures of the contextual determinants of health (*IPUMS*

Contextual Determinants of Health | Cdoh.Ipums.Org, n.d.) and compare their utility for

assessing MENA and South Asian neighborhood context with the ethnic neighborhood typology

from Aim 1.

For immigrant women's SRH, future research should investigate how government-

imposed barriers and facilitators shape U.S.- and foreign-born contraception decision-making,

access, and use. For example, while there may be federally imposed barriers to health access,

California has implemented multiple programs, like Medi-Cal and Family PACT, and healthcare

coverage expansions ensure better SRH access regardless of immigration status. Further research

should investigate how the most recent Medi-Cal expansion which allows adult ages 26-49 years

to qualify for the full-scope of Medi-Cal regardless of immigration status, will influence

immigrant SRH use (Department of Health Care Services, 2023). Future studies should also

consider the use of longitudinal data to investigate the immediate impact that anti-immigrant

policies and practices had on contraception use among immigrants of different citizenship

statuses. Finally, there is a need for deeper investigations of how individual (e.g., race/ethnicity,

age, sexual orientation) and contextual factors (e.g. regional context) interact with citizenship to

influence contraception use, as this would help researchers understand if citizenship status poses

differential levels of barriers for certain subgroups of immigrants.

Appendix A. Response rates for the American Community Survey 2016-2020

	2016	2017	2018	2019	2020
California					
Household units	94.4%	93.8%	93.1%	86.5%	69.9%
Group quarters (GQ)	94.6%	90.1%	87.5%	90.2%	35.3%

Derived from the page "Response Rates" (US Census Bureau, n.d.).

Appendix B. List of country codes from the 2020 5-year estimates American Community Survey for individuals of MENA and South Asian country of origin

Region	Country	Country code		
		Place of birth	Father's place of birth	Mother's place of birth
		bpld	bpld_pop	bpld_mom
Middle East	Middle East			
	Bahrain	--	--	--
	Iran	52200	52200	52200
	Iraq	53200	53200	53200
	Israel	53400	53400	53400
	Jordan	53500	53500	53500
	Kuwait	53600	53600	53600
	Lebanon	53700	53700	53700
	Oman	--	--	--
	Palestine	53400	53400	53400
	Qatar	--	--	--
	Saudi Arabia	54000	54000	54000
	Syria	54100	54100	54100
	Turkey	54200	54200	54200
	United Arab Emirates	54300	54300	54300
	Yemen	54400	54400	54400
North Africa	North Africa	60019	60019	60019
	Algeria	60011	60011	60011
	Egypt	60012	60012	60012
	Libya	60013	60013	60013
	Morocco	60014	60014	60014
	Somalia	60053	60053	60053
	Sudan	60015	60015	60015
	South Sudan	60066	60066	60066
	Tunisia	60016	60016	60016
South Asia	South Asia	--	--	--
	Afghanistan	52000	52000	52000
	Bangladesh	52110	52110	52110
	Bhutan	52120	52120	52120

	Burma (Myanmar)	52130	52130	52130
	India	52100	52100	52100
	Nepal	52400	52400	52400
	Pakistan	52140	52140	52140
	Sri Lanka (Ceylon)	52150	52150	52150
North America	United States (states and territories)	100-5600 1000-11500	100-5600 1000-11500	100-5600 1000-11500

Appendix C. Kernel density curves for the proportion of MENA and South Asians within PUMAs in California (N=265)

MENA
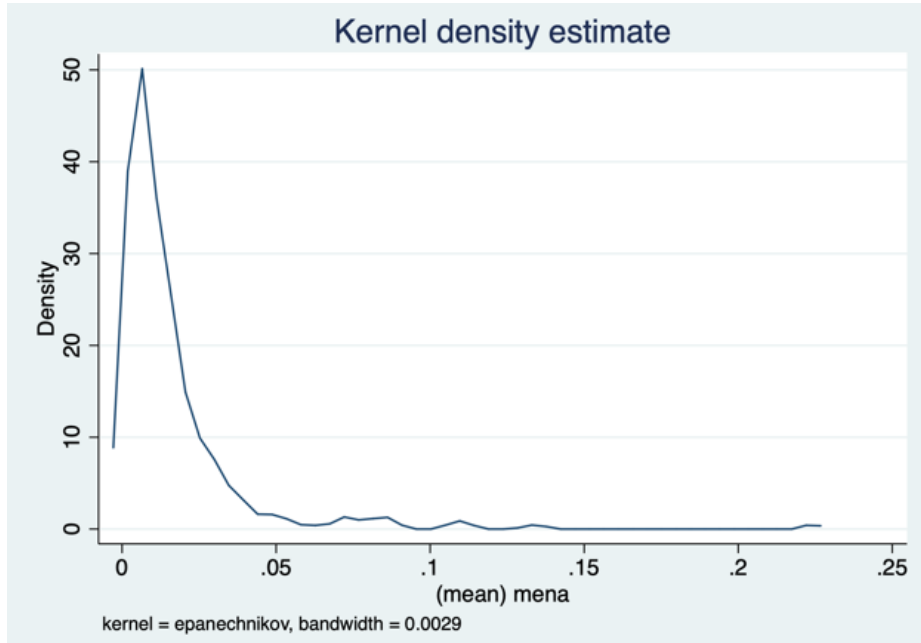
South Asian
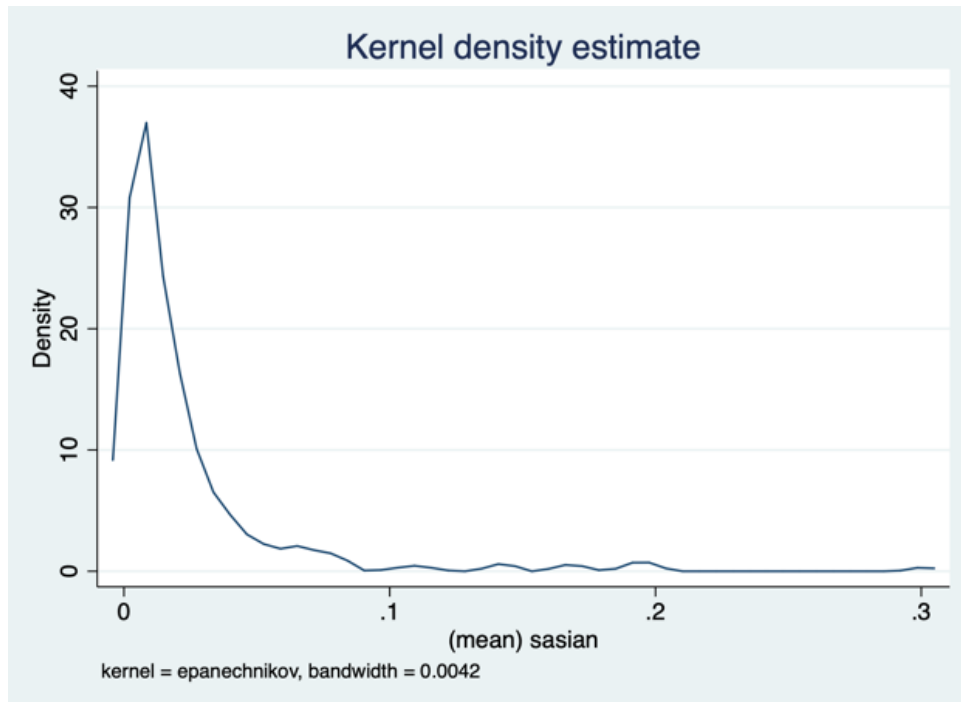
Appendix D. Neighborhoods in California with only a high concentration of MENA Americans (N=32)

Name	County	Urban/ suburban/ rural county	Central city	% MENA	% Foreign born	% White	% Black	Median household income	Median MENA household income	% College graduate	% Home owners
Glendale City	Los Angeles	Urban	in central city	22.4%	54.6%	40.6%	1.6%	$ 81,023	$ 70,000	56.3%	35.1%
LA City (Northwest/Encino & Tarzana)	Los Angeles	Urban	in central city	11.0%	40.4%	36.0%	4.1%	$ 87,124	$ 78,974	49.4%	54.1%
LA City (Central/Pacific Palisades)	Los Angeles	Urban	in central city	8.7%	22.2%	66.0%	2.8%	$ 146,810	$ 195,000	71.0%	57.4%
LA City (Northwest/Canoga Park, Winnetka & Woodland Hills)	Los Angeles	Urban	in central city	8.6%	37.3%	34.6%	5.0%	$ 95,500	$ 96,900	50.5%	51.7%
Burbank City	Los Angeles	Urban	in central city	8.4%	31.9%	45.3%	3.1%	$ 95,036	$ 49,480	58.1%	47.3%
LA City (Northeast/Sunland, Sun Valley & Tujunga)	Los Angeles	Urban	in central city	7.9%	43.2%	31.1%	1.8%	$ 81,439	$ 79,075	37.8%	58.5%
LA City (West Central/Westwood & West Los Angeles)	Los Angeles	Urban	in central city	7.3%	32.3%	43.9%	4.3%	$ 101,248	$ 87,000	64.0%	30.8%
LA City (Northwest/Chatsworth & Porter Ranch)	Los Angeles	Urban	in central city	6.1%	35.0%	33.5%	6.2%	$ 105,660	$ 100,316	50.2%	60.2%
West Hollywood & Beverly Hills Cities	Los Angeles	Urban	not in central city	10.9%	30.9%	63.2%	3.2%	$ 100,654	$ 118,461	79.2%	34.8%
Calabasas, Agoura Hills, Malibu &	Los Angeles	Urban	not in central city	7.2%	21.4%	69.5%	1.6%	$ 180,000	$ 154,170	61.5%	76.3%

Westlake Village Cities											
Mission Viejo & Rancho Santa Margarita (West) Cities	Orange	Urban	not in central city	5.3%	23.8%	56.6%	1.2%	$ 134,634	$ 123,699	57.5%	76.0%
El Cajon & Santee Cities	San Diego	Urban	not in central city	13.4%	24.8%	49.2%	4.2%	$ 79,197	$ 40,450	35.4%	49.7%
Walnut Creek (West), Lafayette, Orinda Cities & Moraga Town	Contra Costa	Urban	not in central city	3.0%	19.1%	69.5%	1.1%	$ 189,000	$ 158,980	67.3%	75.7%
LA City (Central/Hancock Park & Mid-Wilshire)	Los Angeles	Urban	in central city	4.7%	34.8%	40.4%	8.9%	$ 90,000	$ 86,590	66.1%	31.3%
Santa Monica City	Los Angeles	Urban	in central city	4.3%	24.9%	59.7%	4.6%	$ 109,484	$ 84,542	74.3%	31.7%
LA City (North Central/Granada Hills & Sylmar)	Los Angeles	Urban	in central city	3.7%	37.8%	22.4%	2.9%	$ 94,971	$ 113,391	36.7%	63.4%
LA City (East Central/Hollywood)	Los Angeles	Urban	in central city	1.9%	41.7%	37.2%	4.7%	$ 66,000	$ 58,320	62.6%	17.3%
LA City (Northeast/North Hollywood & Valley Village)	Los Angeles	Urban	in central city	3.2%	37.0%	40.5%	5.6%	$ 69,693	$ 91,630	52.3%	30.4%
LA City (North Central/Van Nuys & North Sherman Oaks)	Los Angeles	Urban	in central city	2.7%	41.9%	32.6%	4.8%	$ 64,720	$ 60,000	44.2%	30.8%
San Gabriel Valley Region (North)	Los Angeles	Urban	not in central city	5.0%	25.1%	44.4%	8.8%	$ 130,090	$ 118,562	60.1%	72.2%
Santa Clarita City	Los Angeles	Urban	not in central city	2.4%	23.2%	42.6%	4.2%	$ 111,102	$ 72,158	40.9%	67.1%

Redondo Beach, Manhattan Beach & Hermosa Beach Cities	Los Angeles	Urban	not in central city	1.9%	17.6%	62.8%	2.8%	$ 153,000	$ 136,989	65.2%	57.9%
LA (Southwest/Marina del Rey & Westchester) & Culver City Cities	Los Angeles	Urban	not in central city	1.9%	22.4%	47.4%	14.1%	$ 121,889	$ 155,000	67.5%	49.2%
Glendora, Claremont, San Dimas & La Verne Cities	Los Angeles	Urban	not in central city	3.0%	20.3%	41.8%	3.3%	$ 111,474	$ 107,206	50.0%	68.3%
Anaheim City (West)	Los Angeles	Urban	not in central city	2.5%	38.8%	18.4%	3.6%	$ 80,391	$ 50,686	30.7%	39.6%
San Clemente, Laguna Niguel & San Juan Capistrano Cities	Los Angeles	Urban	not in central city	3.5%	18.9%	64.7%	1.2%	$ 121,000	$ 121,780	59.0%	65.4%
Arden-Arcade, Carmichael & Fair Oaks (West)	Sacramento	Urban	not in central city	2.2%	16.1%	67.1%	4.0%	$ 91,090	$ 68,819	52.4%	60.6%
Colton, Loma Linda & Grand Terrace Cities	San Bernardino	Urban	not in central city	1.8%	23.8%	21.0%	5.8%	$ 71,000	$ 45,562	34.1%	53.0%
San Diego City (Central/Mid-City)	San Diego	Urban	in central city	3.0%	31.6%	28.3%	10.1%	$ 57,108	$ 38,832	35.2%	30.9%
San Diego City (Central/Clairemont & Kearny Mesa)	San Diego	Urban	in central city	2.6%	23.6%	50.2%	3.7%	$ 95,867	$ 68,637	55.1%	46.2%
Lemon Grove City, La Presa & Spring Valley	San Diego	Urban	not in central city	4.1%	20.6%	36.8%	10.4%	$ 86,466	$ 66,621	37.8%	62.3%
San Diego (East Central/Navajo) & La Mesa Cities	San Diego	Urban	not in central city	2.1%	17.1%	57.5%	5.8%	$ 95,458	$ 58,300	52.7%	54.4%

| Turlock, Riverbank, Oakdale & Waterford Cities | Stanislaus | Suburban | not in central city | 3.5% | 20.5% | 47.4% | 1.2% | $ 74,428 | $ 46,167 | 27.5% | 59.4% |

Appendix E. Neighborhoods in California with only a high concentration of South Asian Americans (N=70)

Name	County	Urban/ suburban/ rural county	Central City	% South Asian	% Foreign born	% White	% Black	Median household income	Median South Asian household income	% College graduate	% Home owners
Fremont City (East)	Alameda	Urban	not in central city	30.1%	49.8%	17.9%	3.0%	$ 154,655	$ 197,147	59.4%	59.8%
Union City, Newark & Fremont (West) Cities	Alameda	Urban	not in central city	19.7%	47.1%	14.8%	3.7%	$ 147,270	$ 189,334	54.1%	66.0%
Hayward City	Alameda	Urban	not in central city	6.7%	41.2%	14.9%	8.7%	$ 106,000	$ 113,418	41.5%	54.9%
Livermore, Pleasanton & Dublin Cities	Alameda	Urban	not in central city	14.2%	29.8%	45.7%	2.0%	$ 170,087	$ 205,534	58.5%	70.6%
San Ramon City & Danville Town	Contra Costa	Urban	not in central city	16.5%	31.3%	46.3%	2.6%	$ 206,165	$ 268,015	60.6%	81.7%
Richmond (North), Hercules & El Cerrito Cites	Contra Costa	Urban	not in central city	5.4%	33.1%	30.2%	12.9%	$ 113,297	$ 95,558	58.0%	66.9%
Torrance City	Los Angeles	Urban	in central city	7.0%	33.4%	29.9%	2.9%	$ 110,500	$ 140,735	57.5%	54.2%
Sacramento City (Northwest/Natomas)	Sacramento	Urban	in central city	8.2%	25.4%	28.8%	14.5%	$ 92,500	$ 103,552	45.5%	55.8%
Folsom City, Orangevale & Fair Oaks (East)	Sacramento	Urban	not in central city	6.9%	16.4%	61.5%	3.3%	$ 127,000	$ 160,809	52.8%	71.6%
North Highlands, Foothill Farms & McClellan Park	Sacramento	Urban	not in central city	5.8%	28.3%	43.4%	11.2%	$ 54,910	$ 24,700	26.4%	37.4%
San Diego City (Central/Mira Mesa & University Heights)	San Diego	Urban	in central city	7.5%	39.2%	35.5%	3.1%	$ 95,000	$ 150,020	56.5%	37.8%

San Diego City (Northwest/Del Mar Mesa)	San Diego	Urban	in central city	6.0%	34.9%	44.1%	1.3%	$ 162,871	$ 153,642	61.8%	70.3%
San Diego (Northeast/Rancho Bernardo) & Poway Cities	San Diego	Urban	not in central city	5.0%	24.7%	55.9%	2.2%	$ 130,104	$ 162,879	60.1%	71.0%
Tracy, Manteca & Lathrop Cities	San Joaquin	Urban	not in central city	7.7%	25.6%	31.7%	4.9%	$ 104,630	$ 122,600	27.7%	64.5%
San Mateo (South) & Half Moon Bay Cities	San Mateo	Urban	not in central city	5.9%	33.9%	45.3%	1.5%	$ 170,087	$ 217,000	64.3%	60.8%
Sunnyvale & San Jose (North) Cities	Santa Clara	Urban	in central city	19.6%	50.3%	25.6%	1.3%	$ 166,994	$ 199,000	66.1%	47.1%
San Jose (Northwest) & Santa Clara Cities	Santa Clara	Urban	in central city	19.0%	48.1%	28.1%	2.6%	$ 150,000	$ 183,373	64.2%	39.1%
Milpitas & San Jose (Northeast) Cities	Santa Clara	Urban	in central city	14.3%	56.3%	9.8%	2.5%	$ 144,785	$ 212,618	59.1%	63.1%
San Jose City (Southeast/Evergreen)	Santa Clara	Urban	in central city	10.4%	46.1%	14.1%	2.5%	$ 150,050	$ 268,762	47.6%	73.3%
Cupertino, Saratoga Cities & Los Gatos Town	Santa Clara	Urban	not in central city	17.1%	41.3%	40.3%	0.8%	$ 216,534	$ 280,000	66.6%	71.3%
San Jose (West Central) & Campbell Cities	Santa Clara	Urban	not in central city	11.4%	42.0%	32.2%	4.0%	$ 146,810	$ 230,905	60.0%	48.6%
San Jose City (Southwest/Almaden Valley)	Santa Clara	Urban	not in central city	8.0%	32.1%	38.8%	2.7%	$ 176,271	$ 223,556	58.0%	75.0%
Mountain View, Palo Alto & Los Altos Cities	Santa Clara	Urban	not in central city	6.4%	38.0%	47.3%	1.9%	$ 203,654	$ 307,419	65.8%	53.9%
San Jose City (South Central/Branham) & Cambrian Park	Santa Clara	Urban	not in central city	6.0%	33.2%	36.9%	2.6%	$ 140,226	$ 179,512	53.2%	60.4%

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Yuba City	Sutter & Yuba	Rural	not in central city	7.9%	19.1%	48.9%	2.3%	$ 70,509	$ 70,300	25.0%	58.9%
San Leandro, Alameda & Oakland (Southwest) Cities	Alameda	Urban	not in central city	2.4%	33.2%	29.7%	8.8%	$ 114,600	$ 89,099	55.2%	55.7%
Castro Valley, San Lorenzo & Ashland	Alameda	Urban	not in central city	1.8%	32.1%	27.5%	10.7%	$ 110,361	$ 93,844	46.6%	56.1%
Pittsburg & Concord (North & East) Cities	Alameda	Urban	not in central city	2.8%	30.8%	27.2%	9.7%	$ 95,036	$ 94,836	33.8%	61.1%
Richmond (Southwest) & San Pablo Cities	Alameda	Urban	not in central city	2.7%	39.9%	13.1%	13.9%	$ 75,923	$ 68,320	30.8%	45.8%
Concord (West), Martinez & Pleasant Hill Cities	Alameda	Urban	not in central city	2.3%	23.6%	47.0%	5.3%	$ 108,237	$ 95,036	49.7%	58.0%
Contra Costa County (Northeast)--Antioch City	Alameda	Urban	not in central city	2.0%	22.3%	27.4%	19.3%	$ 91,688	$ 114,917	30.5%	59.0%
Clovis City	Fresno	Urban	not in central city	2.9%	14.4%	49.3%	2.6%	$ 97,603	$ 110,361	38.0%	67.2%
Fresno City (Southeast)	Fresno	Urban	not in central city	2.5%	28.7%	13.3%	4.7%	$ 52,649	$ 93,600	16.3%	49.1%
Fresno City (Southwest)	Fresno	Urban	not in central city	2.2%	18.5%	19.8%	9.7%	$ 51,637	$ 81,606	19.1%	42.5%
Lakewood, Cerritos, Artesia & Hawaiian Gardens Cities	Los Angeles	Urban	not in central city	4.5%	34.8%	22.9%	7.2%	$ 105,144	$ 101,248	47.2%	67.7%
Diamond Bar, La Habra Heights (East) Cities & Rowland Heights	Los Angeles	Urban	not in central city	3.2%	50.5%	11.9%	2.6%	$ 101,350	$ 130,303	57.1%	69.5%
Arcadia, San Gabriel & Temple City Cities	Los Angeles	Urban	not in central city	2.5%	48.2%	17.7%	1.6%	$ 99,237	$ 131,994	55.8%	57.2%

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LA City (Central/Koreatown)	Los Angeles	Urban	in central city	2.0%	57.8%	7.4%	4.9%	$ 48,108	$ 52,649	47.2%	5.1%
Monterey Park & Rosemead Cities	Los Angeles	Urban	not in central city	2.0%	55.8%	4.0%	0.5%	$ 71,436	$ 114,600	43.3%	47.4%
Yorba Linda, La Habra & Brea Cities	Orange County	Urban	not in central city	2.4%	23.0%	41.6%	1.7%	$ 122,500	$ 205,000	49.9%	69.0%
Anaheim City (East)	Orange County	Urban	in central city	2.1%	34.9%	24.7%	1.6%	$ 92,259	$ 137,300	37.9%	47.3%
Corona (Northwest) & Norco Cities	Riverside	Urban	not in central city	1.8%	22.8%	33.0%	4.9%	$ 93,148	$ 105,000	31.5%	63.5%
Riverside City (East)	Riverside	Urban	not in central city	1.8%	22.4%	30.8%	6.8%	$ 86,293	$ 92,100	31.5%	53.8%
Elk Grove City	Sacramento	Urban	not in central city	4.7%	25.8%	32.5%	10.7%	$ 109,000	$ 126,715	40.3%	72.1%
Galt, Isleton Cities & Delta Region	Sacramento	Urban	not in central city	4.0%	23.2%	37.9%	5.2%	$ 96,001	$ 86,293	37.2%	73.3%
Rancho Cordova City	Sacramento	Urban	not in central city	3.0%	22.6%	48.2%	10.5%	$ 78,974	$ 109,819	40.9%	58.6%
Sacramento City (North), Antelope & Rio Linda	Sacramento	Urban	not in central city	2.6%	25.2%	43.2%	9.9%	$ 74,428	$ 97,148	23.2%	59.3%
Sacramento City (Southwest/Pocket, Meadowview & North Laguna)	Sacramento	Urban	in central city	2.0%	25.7%	19.4%	18.3%	$ 75,250	$ 51,000	34.6%	53.2%
San Diego (Northwest/San Dieguito) & Encinitas Cities	San Diego	Urban	not in central city	4.9%	21.0%	62.2%	0.9%	$ 154,170	$ 167,800	60.3%	68.5%

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Sunset District (North)	San Francisco	Urban	in central city	2.5%	38.5%	37.5%	2.1%	$ 151,013	$ 156,935	73.2%	57.8%
Sunset District (South)	San Francisco	Urban	in central city	2.3%	41.6%	29.1%	4.4%	$ 140,000	$ 139,200	62.8%	64.4%
North Beach & Chinatown	San Francisco	Urban	in central city	1.9%	32.3%	54.0%	2.4%	$ 147,834	$ 219,832	81.9%	23.6%
Richmond District	San Francisco	Urban	in central city	1.8%	31.3%	46.4%	5.0%	$ 158,000	$ 262,000	75.2%	33.6%
Stockton City (North)	San Joaquin	Urban	not in central city	3.8%	24.7%	23.4%	10.8%	$ 72,696	$ 54,472	27.6%	51.5%
Lodi, Ripon & Escalon Cities	San Joaquin	Urban	not in central city	3.8%	20.1%	47.6%	2.1%	$ 76,000	$ 67,026	27.6%	56.0%
Stockton City (South)	San Joaquin	Urban	not in central city	1.9%	29.2%	15.6%	9.9%	$ 56,738	$ 105,144	14.9%	44.2%
South San Francisco, San Bruno & Brisbane Cities	San Mateo	Urban	not in central city	2.6%	42.3%	24.0%	1.5%	$ 130,518	$ 195,239	55.4%	63.7%
Daly City, Pacifica Cities & Colma Town	San Mateo	Urban	not in central city	2.5%	44.6%	21.4%	2.9%	$ 129,884	$ 134,660	56.9%	61.8%
Menlo Park, East Palo Alto Cities & Atherton Town	San Mateo	Urban	not in central city	1.8%	32.4%	42.8%	4.3%	$ 161,000	$ 294,714	54.1%	61.4%
San Jose City (East Central) & Alum Rock	Santa Clara	Urban	not in central city	4.1%	44.9%	12.4%	1.9%	$ 131,946	$ 194,160	42.9%	68.9%
San Jose City (East Central/East Valley)	Santa Clara	Urban	in central city	3.9%	51.8%	4.7%	2.1%	$ 103,495	$ 137,596	29.2%	51.9%
San Jose City (Northwest)	Santa Clara	Urban	not in central city	3.6%	35.4%	28.8%	4.3%	$ 103,083	$ 158,049	51.9%	36.1%

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San Jose City (Central)	Santa Clara	Urban	not in central city	3.2%	38.3%	29.2%	2.7%	$ 106,108	$ 200,632	48.8%	54.8%
Simi Valley City	Ventura	Urban	not in central city	4.6%	19.7%	55.6%	1.2%	$ 115,000	$ 150,000	45.3%	72.4%
Bakersfield City (West)	Kern	Suburban	not in central city	3.1%	16.9%	38.4%	6.0%	$ 82,626	$ 70,874	30.9%	66.4%
Los Banos & Livingston Cities	Merced	Suburban	not in central city	2.9%	31.3%	25.2%	1.2%	$ 65,900	$ 100,236	14.0%	52.1%
Roseville City	Placer	Suburban	not in central city	4.1%	16.3%	64.8%	1.9%	$ 113,391	$ 171,000	49.9%	69.9%
Rocklin, Lincoln Cities & Loomis Town	Placer	Suburban	not in central city	2.6%	13.5%	69.0%	1.4%	$ 115,600	$ 122,510	47.3%	74.5%
Fairfield & Suisun City Cities	Solano	Suburban	not in central city	2.3%	24.8%	29.5%	16.5%	$ 98,599	$ 81,520	34.9%	57.3%
Davis, Woodland & West Sacramento Cities	Yolo	Suburban	not in central city	2.8%	24.3%	45.0%	2.3%	$ 80,999	$ 70,874	38.9%	48.1%

Appendix F. Neighborhoods in California with High Concentration of MENA and South Asian Americans (N=17)

Name	County	Urban/Suburban/rural county	City	% MENA	% South Asian	% Foreign-born	% White	% Black	Median household income	Median MENA household income	Median South Asian household income	% College graduates	% Home owners
Orange County (Central)-- Irvine City (Central)	Orange	Urban	not in central city	6.7%	6.7%	40.2%	33.2%	1.7%	$ 113,391	$ 81,300	$ 151,873	56.2%	43.7%
Berkeley & Albany Cities	Alameda	Urban	not in central city	2.1%	2.9%	23.4%	50.0%	7.7%	$ 111,826	$ 75,300	$ 94,922	59.7%	43.0%
Concord (South), Walnut Creek (East) & Clayton Cities	Contra Costa	Urban	not in central city	2.8%	3.8%	24.5%	56.4%	3.2%	$ 144,000	$ 101,451	$ 138,608	63.4%	70.2%
Fresno City (North)	Fresno	Urban	not in central city	2.6%	3.5%	17.5%	42.8%	4.7%	$ 85,004	$ 52,811	$ 107,707	43.9%	56.7%
Pasadena City	Los Angeles	Urban	not in central city	2.4%	2.5%	30.8%	32.1%	8.2%	$ 95,100	$ 81,439	$ 104,630	62.5%	41.7%
Palos Verdes Peninsula	Los Angeles	Urban	not in central city	2.8%	2.4%	25.7%	48.6%	2.7%	$ 142,760	$ 137,000	$ 221,126	62.5%	68.1%
Buena Park, Cypress & Seal Beach Cities	Orange County	Urban	not in central city	1.9%	3.7%	31.7%	34.7%	3.2%	$ 107,111	$ 77,252	$ 123,928	51.8%	63.0%
Lake Forest, Irvine (North) Cities & Silverado	Orange County	Urban	not in central city	2.8%	3.7%	30.7%	38.9%	1.6%	$ 126,715	$ 105,298	$ 173,694	52.5%	63.3%

Newport Beach, Aliso Viejo & Laguna Hills Cities	Orange County	Urban	not in central city	4.0%	2.1%	23.6%	62.9%	1.2%	$ 140,000	$ 125,555	$ 199,225	67.2%	62.8%
Rancho Santa Margarita City (East) & Ladera Ranch	Orange County	Urban	not in central city	3.1%	2.0%	17.6%	64.1%	1.4%	$ 174,233	$ 134,008	$ 196,408	53.0%	79.8%
Rancho Cucamonga City	San Bernardino	Urban	not in central city	2.5%	2.4%	21.7%	32.8%	9.0%	$ 103,663	$ 112,700	$ 176,767	44.3%	63.1%
South of Market & Potrero	San Francisco	Urban	in central city	2.3%	3.7%	38.0%	35.6%	5.8%	$ 125,659	$ 60,800	$ 206,165	76.7%	22.5%
San Mateo (North), Burlingame & Millbrae Cities	San Mateo	Urban	not in central city	2.5%	2.7%	35.6%	41.7%	1.4%	$ 153,170	$ 154,624	$ 303,745	61.6%	58.2%
Redwood City, San Carlos & Belmont Cities	San Mateo	Urban	not in central city	1.8%	4.4%	31.2%	48.2%	1.1%	$ 170,645	$ 197,637	$ 274,548	62.1%	56.9%
Corona City (South), Woodcrest & Home Gardens	Riverside	Urban	not in central city	2.2%	2.3%	24.0%	33.7%	7.9%	$ 120,000	$ 136,451	$ 145,000	38.8%	79.9%
Modesto City (East)	Stanislaus	Suburban	not in central city	1.9%	2.2%	16.4%	46.3%	5.6%	$ 71,623	$ 55,383	$ 64,000	28.6%	55.9%
Thousand Oaks City	Ventura	Urban	not in central city	2.2%	3.3%	18.5%	65.9%	1.4%	$ 134,008	$ 146,159	$ 177,000	55.2%	70.1%

Appendix G. Bivariate association of health insurance status by country of origin

Country	Y/N	Has health insurance		Private health insurance	
		N=21,089	p-value	N=13,832	p-value
Iran	N	94.6	0.000	65.0	0.062
	Y	95.9		66.3	
Iraq	N	95.2	0.520	67.0	0.000
	Y	94.8		49.3	
Israel/Palestine	N	95.1	0.667	64.4	0.000
	Y	95.4		79.2	
Jordan	N	95.2	0.560	65.6	0.539
	Y	94.7		64.5	
Kuwait	N	95.2	0.447	65.4	0.000
	Y	94.2		81.9	
Lebanon	N	95.1	0.181	65.4	0.032
	Y	95.8		68.0	
Saudi Arabia	N	95.2	0.003	65.3	0.000
	Y	91.9		81.8	
Syria	N	95.2	0.577	66.3	0.000
	Y	94.8		54.6	
Turkey	N	95.3	0.001	65.0	0.000
	Y	92.8		79.8	
United Arab Emirates	N	95.1	0.602	65.4	0.000
	Y	96.1		91.1	
Yemen	N	95.2	0.002	66.1	0.000
	Y	91.9		39.7	
North Africa	N	95.2	0.844	65.6	0.432
	Y	94.1		56.3	
Algeria	N	95.2	0.037	65.6	0.820
	Y	91.7		66.5	
Egypt	N	95.2	0.411	65.9	0.002
	Y	94.8		62.3	
Libya	N	95.2	0.445	65.6	0.203
	Y	93.6		71.6	
Morocco	N	95.1	0.715	65.5	0.020
	Y	95.5		71.2	
Somalia	N	95.2	0.250	65.7	0.000
	Y	93.0		39.5	
Sudan	N	95.2	0.000	65.7	0.005
	Y	88.6		54.7	
South Sudan	N	95.1	0.696	65.6	0.969
	Y	100.0		66.7	
Tunisia	N	95.1	0.845	65.6	0.045
	Y	95.7		77.3	

	Y/N	Has health insurance N=29,509	p-value	Private health insurance N=23,681	p-value
		South Asian			
Afghanistan	N	96.7	0.000	82.4	0.000
	Y	94.6		41.4	
Bangladesh	N	96.6	0.009	80.6	0.000
	Y	94.9		66.5	
Bhutan	N	96.6	0.464	80.3	0.981
	Y	100.0		80.0	
Burma	N	96.5	0.562	80.7	0.000
	Y	96.8		71.9	
India	N	94.7	0.000	62.9	0.000
	Y	97.1		85.7	
Nepal	N	96.7	0.000	80.3	0.019
	Y	91.5		76.3	
Pakistan	N	96.8	0.000	81.6	0.000
	Y	94.3		65.0	
Sri Lanka	N	96.6	0.003	80.4	0.000
	Y	94.3		74.2	

Appendix H. Household Response Rates for CHIS Surveys conducted from 2017-2020

Composite response rates were calculated as a product of the screener completion rate (i.e., success in introducing the survey to a household and randomly selecting an adult to be interviewed) and the extended interview completion rate (i.e., success in getting one or more selected persons to complete the extended interview) at the household level (California Health Interview Survey, 2019c, 2021c).

Household response rates and for CHIS surveys conducted from 2017-2020

Year	Landline/surname			Cellphone			Overall		
	Screener	Extended interview	Composite	Screener	Extended interview	Composite	Screener	Extended interview	Composite
2017-2018	10.8%	52.0%	4.7%	7.1%	49.0%	2.9%	8.0%	49.9%	3.4%
2019-2020	--	--	--	--	--	--	16.2%	75.2%	12.2%

(California Health Interview Survey, 2017c; 2019c)

Appendix I. Characteristics of the analytic sample and permanent method users among cisgender, heterosexual 18-44 year-old women in California who were at risk of becoming pregnant in the California Health Interview Survey (CHIS) 2017-2020 (N=7,615)

	Analytic Sample	Permanent method users	p-value
	N=5,804	N=1,361	
	Weighted %	Weighted %	
Age			
18-24	23.8	3.6	***
25-34	41.9	21.2	
35-44	34.3	75.2	
Race			
NL White[a]	28.4	35.9	0.095
Latina	48.7	43.2	
NL Asian	15.4	14.5	
NL Black	4.2	3.0	
NL Other	3.3	3.4	
Nativity			
U.S.-born	69.6	63.8	0.108
Foreign-born	30.4	36.2	
Citizenship status			
U.S.-born citizens	69.6	63.8	
Naturalized citizen	12.2	16.1	0.117
Legal permanent resident	7.7	11.7	
Non-citizen without green card	10.5	8.4	
Years in the U.S.[b]			
0-14 years	44.3	40.9	0.606
$\geq$ 15 years	55.7	59.1	
Languages spoken at home[b]			
No English	41.4	46.6	0.314
English and something else	46.8	35.6	
English only	11.7	17.8	
Marital status			
Never married	36.8	9.5	***
Married or living with partner	58.2	86.0	
Widowed/separated/divorced	5.0	4.6	
Household size			
1-2	24.2	11.4	***
3-4	46.2	46.0	
$\geq$ 5	29.6	42.6	
Educational attainment			

HS diploma/GED or less	29.1	34.9	0.094
Some college	23.9	21.9	
College	30.8	25.5	
Graduate degree	16.3	17.7	
Annual household income			
≤$19,999	15.3	9.9	**
$20,000-$69,999	37.2	30.9	
$70,000-$135,000	27.5	29.5	
≥ $135,000	20.0	29.7	
Survey year			
2017	27.8	32.0	***
2018	26.2	34.4	
2019	23.0	18.1	
2020	23.0	15.5	
Health insurance status			
Uninsured	30.8	28.0	0.382
Public health insurance	9.2	7.8	
Private health insurance	60.0	64.2	
Has usual source of care other than ED	81.6	85.8	0.127

Notes: a. Non-Latina (NL); b. Among only foreign-born (n=1,689); c. Sample size (N) are unweighted, percentages are weighted population estimates; d. * $p<0.05$, ** $p<0.01$, *** $p<0.001$

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