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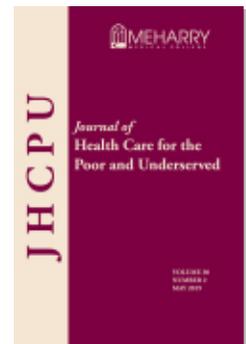
Data Opportunities for Studying the Sexual and Reproductive Health of Immigrants in the United States

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Data Opportunities for Studying the Sexual and Reproductive Health of Immigrants in the United States

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Abstract: This paper aims to identify, review, and evaluate publicly available national- and local-level data sources that collect information on the sexual and reproductive health (SRH) of immigrants in the United States. We review public-use sources from the last 30 years that include information on immigration, SRH, health service utilization, and race/ethnicity. For each source, we evaluated the strengths and challenges of the study design and content as they relate to studying immigrant SRH. We identified and reviewed 22 national and seven local sources. At the national level, the National Longitudinal Study of Adolescent to Adult Health and the National Survey of Family Growth contained the most information; at the local level, the New York City Community Health Survey was the most robust. These sources present opportunities to advance research, improve public health surveillance, and inform policies and programs related to the SRH of this rapidly growing and often underserved population.

Key words: Immigrants, sexual health, reproductive health, database.

Since the passing of the Immigration and Nationality Act of 1965, the share of the United States population that was not born in the country has grown from 9.6 million or 5% of the total population to a record estimated population of 43.7 million (or 14%) in 2016.^{1,2} The foreign-born population lives in every state in the country, with over half living in California, New York, Texas, and Florida.³ (In this paper, we refer to the foreign-born population as *immigrants*.) With the rapid growth of the immigrant population and the country's changing political climate, researchers and advocates alike have called for more research on the health behaviors, needs, and outcomes of immigrants.⁴⁻⁷ Literature suggests that immigrants, broadly, have better birth and maternal health outcomes and lower overall mortality rates than the U.S.-born population.^{8,9} At the same time, their access to health care is often challenged due to lower rates of health insurance coverage, lack of familiarity with the health system, and linguistic

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barriers.^{8,9} Despite the vast heterogeneity of the immigrant population, research rarely disaggregates immigrant data by factors such as race/ethnicity or length of stay.⁵⁻⁷ Furthermore, the sexual and reproductive health (SRH) of many immigrant groups is not well-documented in the current public health literature. Research in the immigrant population has been constrained by data limitations, particularly at the subgroup level. Few data sources collect disaggregated race/ethnicity data for subgroup analyses, provide comparable definitions of immigration status across surveys, use multilingual survey tools, and/or employ methodological techniques such as oversampling immigrants or linking individual- and population-level data sources to facilitate analyses.^{4,5,10,11} Consequently, we do not know the extent to which many SRH measures differ by nativity status (foreign- versus U.S.-born) and between ethnic subgroups. Race and ethnicity data are particularly important given that they provide additional depth and context to the immigrant experience of specific groups. Other facets of nativity status may also influence SRH and health care access, including length of stay, language skills, and documentation status.¹²⁻¹⁸ Cumulatively, these factors may influence immigrants' ability to seek out health resources and navigate the health system. In fact, small-scale studies suggest that immigrant women are less likely to seek out SRH-related cancer screenings.¹⁹⁻²¹ Additionally, existing literature suggests that outcomes and behaviors vary by immigrant generation. For example, for a variety of health indicators, the protective immigrant health effect decreases with each subsequent generation.²² However, less is known about how SRH measures change from one generation to the next since data across immigrant generations are typically unavailable.

In order to develop effective, evidence-based programs and policies that support immigrant SRH, additional research is needed. The goal of this paper is to review and summarize existing publicly-available quantitative data sources that include information on nativity status, race/ethnicity, SRH behaviors and outcomes, and health care utilization. We focus on national datasets and highlight select local data sources as these may be more responsive to research questions at the state and city levels. We evaluate the information collected for each data source, propose recommendations to address existing data challenges, and highlight opportunities to advance future study of immigrant SRH. This article should serve as a resource for researchers and advocates interested in further supporting the SRH of immigrant populations in the U.S. by using robust data to inform the policy and programmatic decisions made on behalf of these populations.

Methods

Data sources are included in this review if they are publicly available and contain at least 1) one measure of immigration, 2) one measure of sexual and/or reproductive health, and 3) data collected between 1987 and 2017. We focus on sources from the last 30 years because demographic trends show that immigrant populations in the U.S. have rapidly and steadily increased within this time frame.¹ We examine data sources into two categories: national level and local level (i.e., state, county, and city data). To identify national-level data, we reviewed publicly-available data sources from select federal agencies such as the Centers for Disease Control and Prevention, the U.S. Census Bureau, and the Bureau of Labor Statistics, as well as academic institutions such

as the UNC Carolina Population Center and Princeton University. Eligible local-level surveys were identified by focusing on data sources from states with the largest immigrant populations, including California, Texas, New York, Florida, New Jersey, Illinois, and Massachusetts.² We identify only a shortlist of these local data sources, primarily from state departments of health, to provide examples of the utility of non-national data in assessing immigrant SRH. In contrast, we aim to provide a comprehensive list of relevant national-level data sources.

For each data source included in this review, we provide a brief description of the survey, including its aims, design, and sample size. As a point of reference, we also provide an example publication that uses the data source. We identify measures of immigration, race and ethnicity, SRH, and health service utilization. Each of these categories is detailed below.

Survey aims and design. For each data source, we include its full name, the affiliated research institution, and a summary of the survey's main purpose. We also indicate the timeframe covered by the data source, the number of survey waves or rounds, and the intervals at which they occurred. Throughout this paper, we refer to most data sources by their acronyms, which are spelled out in Tables 1 and 2. We indicate the survey design (e.g., cross-sectional or longitudinal), population, sampling frame (e.g., neighborhoods, households, clinics), and the representativeness of the sample. Each survey that we included is conducted in languages other than English.

Sample size. We include the rounded sample size from the most recent data available at the time of this review and any oversampling that occurred. We also report the number of women aged 15–44 and the foreign-born sample from the data source's website and/or codebook, when available. Although imprecise, these figures can provide a sense of the number of immigrant women of reproductive age (15–44) in the sample. All reported sample sizes, unless otherwise indicated, are rounded to the nearest hundred and include both men and women.

Sample publication. For each data source, we include a published study as an example of quantitative research that uses the corresponding data to study immigrant health. When possible, we list articles specifically about immigrant SRH.

Immigration. We identify measures of immigration related to immigrant status and context such as nativity (i.e., born in or outside of the U.S.), citizenship, documentation (e.g., green card or visa status), length of stay in the U.S., year/age of entry, country or region of birth, and language spoken at home.

Race and ethnicity. We report racial categories from each of the surveys using the 2015 guidelines issued by the Office of Management and Budget (OMB).²³ The OMB recommends that the minimum standard for measures of race should include the distinct categories of American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or other Pacific Islander, and White. For ethnicity, although the OMB minimum standard only includes Hispanic/Latino and non-Hispanic/Latino origin, we highlight additional ethnicity information when provided. In surveys that collected this additional information, ethnicity categories typically reflected regions or countries of origin (e.g., Chinese, Ethiopian). We also identify data sources that report on ancestry, a component of immigrant history and potential identifier of ethnicity or country of origin.

Sexual and reproductive health. This review focuses on the following six SRH domains, each representing multiple measures of SRH: (1) pregnancy intention (i.e., wantedness of past, current, or future pregnancy), (2) fertility history (e.g., number of births or children, maternal age at first birth, history of abortion, and other pregnancy outcomes), (3) contraceptive use (e.g., current method(s) used and history of method use), (4) HIV/STI history (e.g., history of HIV/STI testing or treatment, HPV vaccination, and STI diagnoses), (5) sexual behavior (e.g., age at first sexual encounter, timing of last sexual encounter, and other information about sexual encounters), and (6) sexual orientation.

Health service utilization. We also examine each data source for two key domains of health service utilization: health insurance status and source of care. Source of care typically assesses the type of health provider visited for services, such as private doctor, public clinic, hospital, or urgent care. Follow-up questions related to each source of care may include the type and quality of care provided. This information is important when considering if and how immigrant populations access health services generally and SRH care specifically.

Results

Data sources and sample size. Based on the selection criteria described earlier, we identified 29 publicly available data sources that collected data on immigration, race/ethnicity, SRH, and health service utilization. Table 1 reports on 22 publicly available nationally representative data sources, including 14 longitudinal and eight cross-sectional surveys. We identified the immigrant sample size in the most recent rounds of 14 of these data sources. Three surveys (National Survey of Reproductive and Contraceptive Knowledge [Fog Zone],²⁴ Panel Study of Income Dynamics [PSID]—Child Development Survey [CDS],²⁵ and National Longitudinal Survey of Youth [NLSY97]²⁶) had fewer than 500 immigrants in their most recent samples. Another three (National Longitudinal Survey of Youth [NLSY79],²⁷ Fragile Families and Child Wellbeing Study [FFCWS],²⁸ and Panel Study of Income Dynamics [PSID]—Individual and Family Data [Main]²⁹) surveyed 500–1,000 immigrants. Four surveys (National Longitudinal Study of Adolescent to Adult Health [Add Health],³⁰ Abortion Patient Survey [APS],³¹ National Survey of Family Growth [NSFG],³² National Survey of Families and Households [NSFH],³³ and National Health and Nutrition Examination Survey [NHANES]³⁴) included 1,000–2,000 immigrants in their samples. Three surveys had sample sizes as large as 13,000 (Current Population Survey [CPS]³⁵), 18,000 (National Health Interview Survey [NHIS]³⁶), and 82,000 (American Community Survey [ACS]³⁷). Note that some of these surveys have multiple waves of data; in these cases, pooling waves of data would further increase the sample size of immigrants.

We also identified seven examples of (1) state-level data from New York and California (Pregnancy Risk Assessment Monitoring System [PRAMS],³⁸ California Health Interview Survey [CHIS]³⁹, California Women's Health Survey [CWHHS],⁴⁰ and California Maternal Infant Health Assessment [MIHA]⁴¹); (2) county-level data from Los Angeles (LA County Health Survey [LACHS]⁴²); and (3) city-level data from El Paso (Border Contraceptive Access Study [BCAS]⁴³) and New York City (New York City Community

Table 1.
DESCRIPTIONS OF NATIONAL-LEVEL DATASETS, UNITED STATES, 1987–2017

Study aims and design	Sample size	Sample paper
<p>Name of study Agency Short general description of study's aims. Survey design: cross-sectional/ cohort/etc, how survey is conducted/type of data (population-based/ household/clinic-based) » Intervals (range of years and # of waves)</p>	<p>» Representativeness » Oversampled groups » Total sample size (most recent year) » Number of respondents/women age 15– 44 (year) » Number of foreign born (year)</p>	<p>Full citation (example of an immigrant health/SRH study using these data)</p>
<p>American Community Survey (ACS) U.S. Census Bureau ACS provides broad social, economic, and housing profiles at the state and county level. Survey design: cross-sectional household survey » Continuous data collection with annual data release</p>	<p>» Nationally representative » 3,147,000 total (2015) » 563,900 women 15–44 (2015) » 81,700 foreign born women 15–44 (2015)</p>	<p>Singh GK, Rodriguez-Lainz A, Kogan MD. Immigrant health inequalities in the United States: use of eight major national data systems. <i>The Scientific World Journal</i>. 2013;2013:1–21. doi:10.1155/2013/512313.</p>
<p>National Longitudinal Study of Adolescent to Adult Health (Add Health) UNC Carolina Population Center Add Health began as a study on adolescent health but has since expanded to studying developmental and health trajectories from adolescence to adulthood. Survey design: longitudinal study of a cohort of adolescents who were in 7th–12th grade in 1994–95; school-based survey » 1994–2008 (ongoing): 5 waves of data</p>	<p>» Nationally representative » Oversample of African-American adolescents with a parent with a college degree » 15,700 total (2008) » 10,500 women 25–34 (1995) » 1,900 foreign born (1995)</p>	<p>Hahn HC, Lahiff M, Barreto RM. Asian American adolescents' first sexual intercourse: Gender and acculturation differences. <i>Perspectives on sexual and reproductive health</i>. 2006;38(1):28–36.</p>

(continued on p. 565)

Table 1. (continued)

Study aims and design	Sample size	Sample paper
<p>Abortion Patient Survey (APS) Guttmacher Center for Population Research Innovation and Dissemination APS collects data from women about their abortion and other sexual and reproductive health measures. Survey design: cross-sectional survey of women obtaining abortions, clinic-based survey » 1987–2012 (ongoing): 5 rounds but only 2008 publically available currently</p>	<p>» Nationally representative of health facilities » 9,500 total women from 95 facilities (2008) » 9,500 women 15–44 (2008) » 1,500 foreign born women 15–44 (2008)</p>	<p>Jerman J, Jones RK, Onda T. Characteristics of US Abortion Patients in 2014 and Changes since 2008. New York, NY: Guttmacher Institute; 2016.</p>
<p>Current Population Survey (CPS) U.S. Census Bureau, U.S. Bureau of Labor Statistics CPS is the primary source for monthly labor force statistics but also collects data supplemental inquiries on other topics such as fertility and health insurance. Survey design: 4-8-4 sample rotation in which a housing unit or group quarters is interviewed for 4 consecutive months, removed from sample for 8 months, re-interviewed for another 4 consecutive months, and then retired from sample permanently, household survey » Continuous data collection; data for supplemental topics may be collected annually or biannually</p>	<p>» Nationally representative » 185,500 total (2016) » 95,500 women (2016) » 12,700 foreign born women (2016)</p>	<p>Alvira-Hammond M, Guzzo KB. Fertility differentials across race-ethnicity and generational status: incorporating non-hispanic immigrants. Presented at: Population Association of America 2013 Annual Meeting. Accessed June 2, 2017.</p>
<p>Early Childhood Longitudinal Study—Birth cohort (ECLS-B) U.S. Department of Education—National Center for Education Statistics ECLS-B follows childrens early cognitive, social, emotional, and physical development from birth to kindergarten entry. Survey design: longitudinal study of a birth cohort (children born in 2001); population-based survey » 2001–2006: Initial interview at 9-months plus 3 waves of data; mother typically interviewed at every wave; father interviewed at initial and waves 1 and 2</p>	<p>» Nationally representative » Oversample of Chinese and other Asian and Pacific Islander, American Indian and Alaska Native children, twins and children born with low and very low birth weight » 1,900 total children (2006/2007) » Sub-group sample sizes not readily available</p>	<p>Guzman L, Wildsmith E, Manlove J, Franzetta K. Unintended births: patterns by race and ethnicity and relationship type. Perspectives on Sexual and Reproductive Health. 2010;42(3):176–185. doi:10.1363/4217610.</p>

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Table 1. (continued)

Study aims and design	Sample size	Sample paper
<p>Early Childhood Longitudinal Study—Kindergarten (ECLS-K) U.S. Department of Education—National Center for Education Statistics ECLS-K follows children's experience with family, school, community and individual growth as it relates to their school progression and performance.</p>	<ul style="list-style-type: none"> » Nationally representative » 12,000 total (2007) » Sub-group sample sizes not readily available 	<p>Guzman L, Wildsmith E, Manlove J, Franzetta K. Unintended births: patterns by race and ethnicity and relationship type. <i>Perspectives on Sexual and Reproductive Health</i>. 2010;42(3):176–185. doi:10.1363/4217610.</p>
<p>Survey design: longitudinal cohort study of children who entered kindergarten in 1998–1999 until they enter eighth grade, population based » 1998–2007: 5 waves of data</p>	<ul style="list-style-type: none"> » Representative of non-marital births in each of 20 cities and non-marital births in US cities with populations over 200,000 » 7,100 total (2010) » 3,200 women 23–44 (2010) » 800 foreign born women (2010) 	<p>Taylor CA, Guterman NB, Lee SJ, Rathouz PJ. Intimate partner violence, maternal stress, nativity, and risk for maternal maltreatment of young children. <i>Am J Public Health</i>. 2009;99(1):175–183. doi:10.2105/AJPH.2007.126722.</p>
<p>Fragile Families and Child Wellbeing Study (FFCWS) Princeton University's Center for Research on Child Wellbeing and Center for Health and Wellbeing; the Columbia Population Research Center, and Columbia University's National Center for Children and Families FFCWS follows children and “fragile families,” which refers to family units of unmarried parents and their children, who are at greater risk of breaking up and living in poverty than more traditional families.</p>	<ul style="list-style-type: none"> » Nationally representative » Oversample of groups such as persons 60 and older, African American, Hispanic, and Asians (may differ by survey round) » 10,200 (2014) » 5,200 women (2014) » 1,900 foreign born (2014) 	<p>Singh GK, Rodriguez-Lainz A, Kogan MD. Immigrant health inequalities in the United States: use of eight major national data systems. <i>The Scientific World Journal</i>. 2013;2013:1–21. doi:10.1155/2013/512313.</p>
<p>Survey design: longitudinal study of a cohort of unmarried couples whose children were born between 1998 and 2000; population-based survey » 1998–2017 (ongoing): 6 waves of data</p>	<p>National Health and Nutrition Examination Survey (NHANES) Center for Disease Control—National Center for Health Statistics NHANES is a program of studies designed to assess the health and nutritional status of adults and children in the US.</p>	<p>Survey design: cross-sectional, household survey and physical examinations » 1971–1994: 3 rounds of data at irregular intervals; 1999–2016 (ongoing); 9 rounds of data at 2 year intervals of continuous data collection</p>

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Table 1. (continued)

Study aims and design	Sample size	Sample paper
<p>National Health Interview Survey (NHIS) Center for Disease Control—National Center for Health Statistics NHIS is the principal source of information on the amount, distribution and effects of illness and disability in the US and the services rendered for or because of such conditions. Survey design: cross-sectional, household survey » 1957–2016 (ongoing): continuous data collection, revised in 1997 and revised again in 2018</p>	<p>» Nationally representative » Oversample of persons aged 65 or older who are Black, Hispanic, or Asian » 103,800 persons (2015) » 53,500 women (2015) » 17,700 foreign born (2015)</p>	<p>Singh GK, Rodriguez-Lainz A, Kogan MD. Immigrant health inequalities in the United States: use of eight major national data systems. <i>The Scientific World Journal</i>. 2013;2013:1–21. doi:10.1155/2013/512313.</p>
<p>Special population focus on Native Hawaiian and Pacific Islander available 2016; Additional Hispanic, Asian and Native Hawaiian or Pacific Islander ancestry/origin to be added in 2018</p>	<p>» Nationally representative sample of adult immigrants (+18) admitted to legal permanent residence; child immigrants defined as children of U.S. citizens born abroad (<18) or adopted orphans (<5) » 8,600 adults, 800 children (2009) » 5,900 respondents 19–44 (2004) » 8,600 foreign born (2004)</p>	<p>Akresh IR, Frank R. Health selection among new immigrants. <i>Am J Public Health</i>. 2008;98(11):2058–2064. doi:10.2105/AJPH.2006.100974.</p>
<p>New Immigrant Survey (NIS) Princeton University; U.S. Immigration and Naturalization Service NIS is a multi-cohort prospective-retrospective panel study of new legal immigrants in the U.S. Survey design: multi-cohort prospective-retrospective panel study, population-based survey » 1996: pilot study (NIS-P); 2003–2004: baseline survey (NIS-2003-1); 2007–2009: follow up (NIS-2003-2)</p>	<p>» Nationally representative » Oversample of Black, Hispanic or Latino and military persons » 7,300 total (2012) » 6,300 women 17–23 (1979) » 900 foreign born 17–23 (1979)</p>	<p>Dorius C, Guzzo KB. The long arm of maternal multipartnered fertility and adolescent well-being. Presented by: American Sociological 2013 Annual Meeting. Accessed June 2, 2017.</p>
<p>National Longitudinal Survey of Youth (NLSY79) United States Department of Labor—Bureau of Labor Statistics NLSY79 gathers information in an event history format, including work, marriage, fertility, education, income, health, insurance, substance use and sexual activity. Survey design: longitudinal study of a cohort of 14–22 year olds in 1979, population-based survey » 1979–2014: 26 waves of data</p>		

(continued on p. 568)

Table 1. (continued)

Study aims and design	Sample size	Sample paper
<p>National Longitudinal Survey of Youth (NLSY79 Child/YA) United States Department of Labor—Bureau of Labor Statistics NLSY79 Child/YA expands the information collected by the NLSY79 about children of female respondents. Age appropriate social, cognitive and behavior assessments are given as children mature. Children over 15 (young adults) are interviewed similar to that of the NLSY79.</p>	<p>» 500 children under 15; 5,800 young adults over 15 (2012) » 5,600 women (1986) » Sub-group sample sizes not readily available</p>	<p>Dorius C, Guzzo KB. The long arm of maternal multipartnered fertility and adolescent well-being. Presented by: American Sociological 2013 Annual Meeting. Accessed June 2, 2017.</p>
<p>Survey design: longitudinal study of cohort of children born after 1973 to NLSY79 mothers, population-based survey » 1986-2012: 14 waves biannually for children sample; 1994–2012: 10 waves biannually for young adults sample Connected to mother's data in NLSY79 (i.e. immigration)</p>	<p>» Nationally representative » Oversample of Hispanic or Latino and Black adolescents » 7,100 total (2013) » 7,100 respondents 28–34 (2013)/12–18 (baseline) » 400 foreign born (2013)</p>	<p>Bronte-Tinkew J, Moore KA, Capps RC, Zaff J. The influence of father involvement on youth risk behaviors among adolescents: a comparison of native-born and immigrant families. <i>Social Science Research</i>. 2006;35(1):181–209. doi:10.1016/j.ssresearch.2004.08.002.</p>
<p>National Survey of Family Growth (NSFG) National Center for Health Statistics, Centers for Disease Control and Prevention NSFG gathers information on family life, marriage and divorce, pregnancy, infertility, use of contraception, and men's and women's health. Survey design: cross-sectional study of men (15–49) and women (15– 44), population-based survey » 1973–2015: 9 waves of data (ongoing)</p>	<p>» Nationally representative » 10,200 total (2015) » 1,000 foreign born women 15–44 (2015)</p>	<p>Hayford S, Guzzo K. Age, relationship status, and the planning status of births. <i>Demographic Research</i>. 2010;23:365–398. doi:10.4054/DemRes.2010.23.13.</p>

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Table 1. (continued)

Study aims and design	Sample size	Sample paper
<p>National Survey of Families and Households (NSFH) Center for Demography, University of Wisconsin Collects data from both parents and children on family formation, marriage, cohabitation, fertility, parenting relations, kin contact, and economic and psychological well-being of the population in the U.S. Survey design: longitudinal study, household survey » 1987–2003: 3 waves</p>	<ul style="list-style-type: none"> » Nationally representative » Oversample of Blacks, Puerto Ricans, Mexican Americans, single-parent families, families with step children, co-habiting couples, and recently married persons » 7,300 total (2003) » 7,800 respondents 20–44 (1987) » 1,000 foreign born (lived in foreign country right after birth) (1987) 	<p>Torres Stone R, Rivera FI, Bertdahl T. Predictors of depression among non-Hispanic Whites, Mexicans and Puerto Ricans: a look at race/ethnicity as a reflection of social relations. <i>Race and Society</i>. 2004;7(2):79–94. doi:10.1016/j.racsoc.2005.05.003.</p>
<p>National Survey of Reproductive and Contraceptive Knowledge (Fog Zone) Guttmacher Center for Population Research Innovation and Dissemination Fog Zone focuses on the attitudes and behaviors of unmarried young adults regarding pregnancy planning, contraception, and related issues, including sexual relationship and pregnancy experiences. Survey design: cross-sectional study of unmarried young adults 18–29 in 2009, population-based survey</p>	<ul style="list-style-type: none"> » Nationally representative sample of unmarried young adults » 1,800 total (2009) » 900 women 18–29 (2009) » 200 foreign born 18–29 (2009) 	<p>Wilson EK. Differences in contraceptive use across generations of migration among women of mexican origin. <i>Matern Child Health J</i>. 2009;13(5):641. doi:10.1007/s10995-008-0382-9.</p>
<p>Panel Study of Income Dynamics (PSID)—Individual and Family Data (Main) University of Michigan PSID focuses on the dynamic aspects of economic and demographic behavior, including a wide range of sociological and psychological measures. Survey design: longitudinal survey, household survey » 1968–1996: annual interviews; 1997–2015: biennial interviews ongoing PSID is currently working to screen and recruit new immigrant families (families in which both partners migrated to the U.S. after 1997) to add to the sample in 2017.</p>	<ul style="list-style-type: none"> » Nationally representative; additional sample of immigrant families added in 1997 » 77,200 total (all years) » 800 foreign born (1997) » Further sub-group sample sizes not readily available 	<p>(Dissertation) Kagotho J. Examining The Longitudinal Impact Of Assets And Income On Immigrant Health Behaviors. January 2009.</p>

(continued on p. 570)

Table 1. (continued)

Study aims and design	Sample size	Sample paper
<p>Panel Study of Income Dynamics (PSID)—Child Development Survey (CDS)</p> <p>University of Michigan</p> <p>CDS surveys are supplements added to the main PSID survey, collecting data about children's health, development and well-being within the context of families, school and neighborhoods.</p> <p>Survey design: longitudinal survey of a cohort study of children 0–12 years old of PSID families in 1997, household survey</p> <p>» 1997–2008: 3 waves of data, CDS-I (1997), CDS-II (2002–2003), CDS-III (2007–2008)</p>	<p>» Nationally representative</p> <p>» 1,500 total children 5–19 (2008)</p> <p>» 300 children from new immigrant sample; 90 foreign born children (1997)</p> <p>» Further sub-group sample sizes not readily available</p>	
<p>Panel Study of Income Dynamics (PSID)—Child Development Survey 2014 (CDS-2014)</p> <p>University of Michigan</p> <p>CDS surveys are supplements added to the main PSID survey, collecting data about children's health, development and well-being within the context of families, school and neighborhoods.</p> <p>Survey design: longitudinal survey of a cohort study of all children 0–17 years old of PSID families in 2014, household survey</p> <p>» 2014–2017: 1 wave of data (ongoing)</p> <p>PSID is currently working to screen and recruit new immigrant families (families in which both partners migrated to the U.S. after 1997) to add to the sample in 2017. Children from these families will be added to future CDS waves.</p>	<p>» Nationally representative</p> <p>» 4,300 total children 3–19 (2014)</p> <p>» Nativity may be coded from mother's immigration data (child's birth year, mother's nativity and citizenship status, mother's first stay/lived in U.S.)</p> <p>» Further sub-group sample sizes not readily available</p>	

(continued on p. 571)

Table 1. (continued)

Study aims and design	Sample size	Sample paper
<p>Panel Study of Income Dynamics (PSID)—Transition to Adulthood Supplement (TAS) University of Michigan TAS is a supplement and follow up to the original PSID's CDS which ended at age 18 and it fills in the gap in information about early adulthood transitions before they enter the PSID main sample Survey design: longitudinal study of a cohort of young adults 18–28 in 2005 who had participated in at least one CDS survey round and family participated in core PSID, household survey; from 2017 forward, TAS will including all young adults in PSID » 2005–2015: 6 waves of data biennially</p>	<p>» Nationally representative » 1,800 total (2013) » Nativity may be coded from mother's immigration data (respondent's birth year, mother's nativity and citizenship status, mother's first stay/lived in U.S.) » Further sub-group sample sizes not readily available</p>	<p>Capps R, Bachmeier JD, Fix M, Van Hook J. A Demographic, Socioeconomic and Health Coverage Profile of Unauthorized Immigrants in the United States. Washington, DC: Migration Policy Institute; 2013.</p>
<p>Survey of Income and Program Participation (SIPP) U.S. Census Bureau » SIPP collects data related to income, labor force, social program participation and demographic characteristics to measure the effectiveness of existing federal, state and local programs » Survey design: continuous series of national panels of persons over 15, household survey » 1984–1993: multiple waves for 10 panels, ranging over 2–4 years per panel; 1996–2014: multiple waves for 5 panels</p>	<p>» Nationally representative » 39,000 total (2008) » Further sub-group sample sizes not readily available</p>	<p>Singh GK, Rodriguez-Lainz A, Kogan MD. Immigrant health inequalities in the United States: use of eight major national data systems. <i>The Scientific World Journal</i>. 2013;2013:1–21. doi:10.1155/2013/512313.</p>
<p>National Vital Statistics System: Birth Data (NVS—Birth Data) Centers for Disease Control and Prevention Data sharing in public health for registration of vital events including births, deaths, marriages, divorces and fetal deaths. U.S. Law requires all birth certificates for all births with all states reporting using uniform registration</p>	<p>» 3,978,500 births (2015) » Further sub-group sample sizes not readily available</p>	

Table 2.
DESCRIPTIONS OF STATE- AND COUNTY-LEVEL DATASETS, UNITED STATES, 1987–2017

Study aims and design	Sample size	Sample paper
Name of study Agency Short general description of study's aims Survey design: cross-sectional/cohort/etc, how survey is conducted/type of data (population-based/household/clinic-based) » Intervals (range of years and # of waves)	» Representativeness » Oversampled groups » Total sample size (most recent year) » Number of respondents/women age 15–44 (year) » Number of foreign born (year)	Full citation (example of an immigrant health/SRH study using these data)
Border Contraceptive Access Study (BCAS) University of Texas at Austin—Population Research Center BCAS compared the experiences of women who obtained their contraceptive pills in clinics in El Paso, TX to those from over the counter pharmacies in Ciudad Juárez. Survey design: longitudinal » 2006–2008: 4 waves of data	» Not representative » 1,000 total women (2006) » 1,000 women 18–44 (2006) » 700 foreign born women (2006)	Aiken ARA, Potter JE. Are Latina women ambivalent about pregnancies they are trying to prevent? Evidence from the border contraceptive access study. <i>Perspect Sex Repro H.</i> 2013;45(4):196–203. doi:10.1363/4519613.
California Health Interview Survey (CHIS) UCLA Center for Health Policy Research CHIS is the nation's largest state health survey, providing information on adults, teens, and children at the state, county, zip code, and district levels. Survey design: cross-sectional household survey » 2001–2015 (ongoing): biannually until 2013 when continuous data collection begins	» Representative of the California population » Recent oversamples of Japanese, Korean, and Vietnamese populations » 21,000 adults, 800 teens and 2,200 children (2015) » 11,700 women (2014) » 3,900 respondents 18–44 (2014) » 4,600 foreign born (2014)	Baldwin SB, Solorio R, Washington DL, Yu H, Huang Y-C, Brown ER. Who is using emergency contraception?: Awareness and use of emergency contraception among California women and teens. <i>Women's Health Issues.</i> 2008;18(5):360–368. doi:10.1016/j.whi.2008.06.005.

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Table 2. (continued)

Study aims and design	Sample size	Sample paper
<p>California Women's Health Survey (CWHHS) CA Department of Health Care Services CWHHS collects information on a wide variety of health indicators and health-related knowledge, behaviors, and attitudes of women in California. Survey design: cross-sectional household survey » 1997–2012 (ongoing): 16 waves of data, annual</p>	<p>» Representative of population of women 18 and older in California » 4,000 women (2012) » 30,200 respondents 18–44 (all years) » Further sub-group sample sizes not readily available</p>	<p>Foster DG, Bley J, Mikanda J, et al. Contraceptive use and risk of unintended pregnancy in California. <i>Contraception</i>. 2004;70(1):31–39. doi:10.1016/j.contraception.2004.01.012.</p>
<p>LA County Health Survey (LACHS) Los Angeles County Department of Public Health Primary source of information on access to health care, health care utilization, health behaviors, health status, and knowledge and perceptions of health-related issues among the LA County population. Survey design: cross-sectional household survey » 1997–2015 (ongoing): 6 waves of data</p>	<p>» Representative of adults and children residing in the county's eight service planning areas and 26 health districts » Oversample of certain geographic areas in the county » 8,000 adults and 6,000 parents/guardians or primary caretakers of children ages 17 years or under (2011) » Sub-group sample sizes not readily available</p>	<p>Yi SS, Roberts C, Lightstone AS, Shih M, Trinh-Shevrin C. Disparities in meeting physical activity guidelines for Asian Americans in two metropolitan areas in the United States. <i>Ann Epidemiol</i>. 2015;25(9):656–660.e2. doi:10.1016/j.annepidem.2015.05.002.</p>
<p>California Maternal Infant Health Assessment (MIHA) California Department of Public Health MIHA surveys women with recent live births in California, collecting self-reported information about maternal and infant experiences and maternal attitudes and behaviors before, during, and shortly after pregnancy. Survey design: cross-sectional population-based survey » 2000–2014 (ongoing): annual data collection</p>	<p>» Representative of all women 15 years and older who have had a live birth in California » 7,000 total (2014) » Sub-group sample sizes not readily available</p>	<p>Cubbin C, Braveman PA, Marchi KS, Chavez GF, Santelli JS, Gilbert BJC. Socioeconomic and racial/ethnic disparities in unintended pregnancy among postpartum women in California. <i>Matern Child Health J</i>. 2002;6(4):237–246. doi:10.1023/A:1021158016268.</p>

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Table 2. (continued)

Study aims and design	Sample size	Sample paper
<p>New York City Community Health Survey (NYCCHS) New York City Department of Health and Mental Hygiene CHS provides data on the health of New Yorkers, including neighborhood, borough, and citywide estimates on a broad range of chronic diseases and behavioral risk factors. Survey design: cross-sectional population-based survey » 2002–2014 (ongoing): annual data collection</p>	<p>» Representative of adults 18–64 and their children from all five boroughs of New York City » 9,000 total (annual sample) » 3,400 respondents 18–44 (2014) » 4,900 women (2014) » 3,900 foreign born (2014)</p>	<p>Yi SS, Roberts C, Lightstone AS, Shih M, Trinh-Shevrin C. Disparities in meeting physical activity guidelines for Asian Americans in two metropolitan areas in the United States. <i>Ann Epidemiol.</i> 2015;25(9):656-660.e2. doi:10.1016/j.annepidem.2015.05.002.</p>
<p>Pregnancy Risk Assessment Monitoring System (PRAMS) Center for Disease Control and Prevention PRAMS is a surveillance project through the CDC and health departments in 47 participating states, New York City, Puerto Rico, the District of Columbia and the Great Plains Tribal Chairmen's Health Board that collect data on maternal attitudes and experiences and is used to identify groups of women and infants at high risk for health problems.</p>	<p>» Representative of state population and 83% of all U.S. live births » Oversample of low weight births; individual states may stratify by mother's race or ethnicity » 1,300–3,400 (annual sample) » Sub-group sample sizes not readily available</p>	<p>D'Angelo DV, Le B, O'Neil ME, et al. Patterns of Health Insurance Coverage Around the Time of Pregnancy Among Women with Live-Born Infants—Pregnancy Risk Assessment Monitoring System, 29 States, 2009. Atlanta, GA: Center for Disease Control and Prevention; 2015.</p>
<p>Survey design: cross-sectional survey of mothers who have recently given live birth, population-based » 1988–2016 (ongoing): continuous data collection but 8 phases of questionnaire content/design changes (~4 years per phase)</p>		

Health Survey [NYCCHS]⁴⁴) (Table 2). Six surveys are cross-sectional and all but one (BCAS) are representative of their target population. The BCAS is also longitudinal in design. We identified the immigrant sample size in three of the local data sources; these ranged from approximately 700 foreign-born respondents in BCAS to 4,000 or more in the NYC CHS and CHIS.

Immigration. At a national level, with the exception of five surveys (National Vital Statistics System: Birth Data [NVSS—Birth Data],⁴⁵ National Longitudinal Survey of Youth [NLSY79 Child/YA],⁴⁶ PSID-CDS, Panel Study of Income Dynamics [PSID]—Child Development Survey 2014 [CDS-2014],⁴⁷ Panel Study of Income Dynamics [PSID]—Transition to Adulthood Supplement [TAS],⁴⁸) all data sources included at least two measures of immigration. The most common were nativity (included in 19 surveys), language spoken at home, country or region of birth, and year of entry (each in 13 surveys) (Table 3). Fourteen data sources (Add Health, CPS, Early Childhood Longitudinal Study—Birth cohort [ECLS-B],⁴⁹ Early Childhood Longitudinal Study—Kindergarten [ECLS-K],⁵⁰ FFCWS, NHANES, New Immigrant Survey [NIS],⁵¹ NLSY79, NLSY79 Child/YA, NLSY97, NSFH, PSID-Main, and Survey of Income and Program Participation [SIPP]⁵², NVSS) collected additional data on respondents' parents' country of birth, year of entry, citizenship, and language spoken at home, allowing for research on second-generation immigrants. Without information about parents' country of birth, it is difficult to determine second generation status, which is defined as being born in the U.S. to foreign-born parents (first-generation immigrants). The NIS, NLSY-79, and PSID-Main collected data on documentation status.

At the state and county level, all seven data sources included at least two measures of immigration; the most commonly collected data were on country of birth, length of stay, and language(s) spoken at home, each included in five surveys (Table 4). The CHIS included the most measures of immigration, including citizenship, language spoken at home, length of stay, country of birth, and documentation status. Four surveys (CHWS, NYC CHS, PRAMS, and BCAS) included a measure of nativity and only NYC CHS and BCAS asked about parents' nativity (Table 4).

Race and ethnicity. Apart from seven data sources (Add Health, FFCWS, NSFH, Fog Zone, PSID-CDS, BCAS, CWHHS, and MIHA), all of the surveys we examined followed the basic OMB guidelines for collecting race and ethnicity data (Tables 3 and 4).²³ Of these surveys that met OMB guidelines, all but another two (APS and ECLS) included two or more more detailed categories for ethnicity. Hispanic subgroups were most frequently disaggregated in comparison with other ethnic groups, followed by Asian and Pacific Islander subgroups. Distinctions for Asian origin focused primarily on select countries such as China, Japan, Korea, the Philippines, India, and Vietnam. Pacific Islander origins include Native Hawaiian, Guamanian, and Samoan. African and European origin were rarely disaggregated. Seven surveys at the national level (ACS, Add Health, FFCWS, NHANES, NLSY-79, NLSY-79 Child/YA, and PSID-Main) and three at the local level (CHIS, LACHS, NYC CHS) had a measure of self-reported ancestry (Tables 3 and 4).

Sexual and reproductive health and health service utilization. With the exception of six data sources (ACS, CPS, ECLS-K, NIS, SIPP, and NVSS), all of the included national surveys collected data on two or more SRH domains relevant to this review (Table 3). The most common domain measured was fertility history; in contrast, data

Table 4.
AVAILABILITY OF MEASURES BY STATE- OR COUNTY-LEVEL DATASETS, UNITED STATES, 1987–2017

	State- or county-level datasets						
	BCAS ¹	CHIS	CWHS	LACHS	MIHA	NYCCHS ²	PRAMS ³
Immigration							
Nativity	x	x				x	x
Citizenship		x		x			
Country or region of birth		x	x	x	x	x	
Length of stay	x	x		x		x	x
Year of entry			x				
Language spoken at home		x		x	x	x	x
Documentation		x					
Race & ethnicity							
Race							
American Indian/Alaska Native	x ^b	x		x		x	x
Asian	x	x	x	x	x ^a	x	x
Black/African American	x	x	x	x	x	x	x
Native Hawaiian/Pacific Islander		x	x	x ^c	x ^a	x	x ^d
White	x	x	x	x	x	x	x
Ethnicity							
Asian origin		x	x	x		x	x
Black/African origin				x			
Hispanic origin	x	x	x	x	x	x	x
Pacific Islander origin		x					x
European origin							
Ancestry		x		x		x	
Sexual & reproductive health							
Pregnancy intentions	x		x	x		x	x
Fertility history	x		x		x		x
Contraceptive use	x		x	x	x	x	x
HIV/STI history		x	x			x	x
Sexual behavior	x	x	x	x		x	
Sexual orientation		x		x		x	
Health service utilization							
Health insurance status	x		x		x	x	x
Source of care	x		x		x	x	x

Notes

^aAsian' and 'Pacific Islander' grouped together

^b'Alaska Native' not included

^cIncludes 'Pacific Islander' only

^dIncludes 'Native Hawaiian' only

¹ Respondent's parent data available for nativity and length of stay measures. Respondent's child data available for nativity and length of stay measures.

² Respondent's parent data available for nativity measure.

³ Respondent's data for nativity, year of entry, language spoken at home, Hispanic origin, and Pacific Islander origin measures are only included in Phase 6 (2009-2011) core questions. For other years and other additional data from National Vital Statistics System - Birth can be requested to be linked and included through state coordinators.

BCAS= Border Contraceptive Access Study

CHIS= California Health Interview Survey

CWHS= California Women's Health Survey

LACHS= LA County Health Survey

MIHA= Maternal Infant Health Assessment

NYCCHS= New York City Community Health Survey

PRAMS= Pregnancy Risk Assessment Monitoring System

on sexual orientation was collected by only four data sources (NHANES, NHIS, Add Health, and NSFG surveys). All of the surveys except the NSFH collected information on health service utilization. Overall, the NSFG and Add Health, followed by NHANES, NHIS, and the Fog Zone, collected the most detailed information across multiple SRH domains and on health care utilization.

At the state, county, and city level, each of the seven data sources included measures of at least two SRH domains; the most common were pregnancy intention, contraceptive use, and sexual behavior, addressed in at least four of seven surveys (Table 4). Five of the seven surveys collected information on health insurance status and source of care. Overall, the CWHS and NYC CHS contained the most information related to SRH and health care utilization.

In general, at the national level, Add Health and NSFG contained the most detailed information on immigration and SRH, followed by NHANES, NHIS, and PSID (Table 3). In contrast, NSFH and NVSS collected the least information on immigration and SRH. At the state and county level, the NYC CHS included the most information for both SRH and immigration, followed by CWHS and CHIS; however, CHIS included more information on immigration (compared with SRH) whereas CWHS collected notably more data on SRH than immigration (Table 4).

Notably, questions that measured immigration, SRH, and health service utilization varied between data sources. In some cases, questions varied between survey wave, as a result of evolving categories and definitions of particular measures. Similarly, the breadth and depth of available SRH information often varied between data sources depending on the purpose of the data source, with some including SRH-related questions in optional modules rather than mandatory core sections of a survey.

Discussion

This analysis identifies national-, state- and local-level data sources that can facilitate further examination of immigrant SRH. We highlight large publicly-available data sources with notable immigrant sample sizes and key information on immigration and SRH to encourage broader use of these data. At the same time, we note potential challenges across data sources. For example, despite being publicly available, some data sources restricted access to disaggregated data by ethnicity due to small sample sizes; however, organizations such as the National Center for Health Statistics can grant access to these restricted data after an application process, allowing for subgroup analyses. The type of information on immigration, race and ethnicity, and SRH also varied between data sources and over time. Race/ethnicity categories also change over time, often reflective of shifting OMB guidelines, and measures of immigration may vary based on published literature identifying new characteristics of the immigrant context. In these cases, pooled analyses across survey waves or surveillance of SRH outcomes over time can be challenging. Furthermore, few data sources collect detailed data on both immigration and SRH, suggesting that researchers may face a trade-off in each data source. Despite these potential challenges, the data sources presented in this paper are critical to initiating and advancing much-needed research on immigrant SRH.

Limitations. This study has several limitations. Although we attempt to provide a

far-reaching list of data sources relevant to the study of immigrant SRH, this paper is not intended as a formal systematic review, so neither the national nor local lists are exhaustive. We also do not include qualitative data sources in this paper. Given our objective to highlight publicly available data sources to study immigrant SRH, we chose to focus on quantitative data, which are often more readily accessible than data from qualitative studies. That being said, we acknowledge the need for qualitative and mixed-method studies to identify the range of SRH issues that affect immigrant communities. For example, qualitative research can help explore how individual motivations, interpersonal dynamics, and social context influence immigrant women's decision-making and outcomes related to SRH—information that is critical to understand immigrants' access to and use of SRH services. These data can also help shape quantitative research that is community-relevant.

This study also does not assess the specificity of the information collected on immigration status and SRH across surveys. For instance, while we highlight which surveys assessed fertility history, the specific measures that represent this domain in each survey may vary. Some surveys may exclude abortion or miscarriage from fertility history or change the number of fertility-related measures collected over time, but these details are not reported here. In an effort to hone the focus of this review, we do not address all measures of SRH or immigration such as reproductive cancer screening or acculturation. These data are available in some of the data sources we reviewed, such as CHIS and Add Health. We encourage future research to examine how acculturation, assimilation, and identity affect a range of SRH behaviors and outcomes.

We do not present specific linkages between data sources, although data from many of the sources we reviewed can be linked to other information such as contextual data. Typically, a study's website or data user manuals will indicate the linkage capabilities of a data source. Incorporating additional information such as census or birth data in the study of individual-level outcomes can help assess the impact of contextual factors such as affordable housing or neighborhood-level poverty.

Finally, we do not include measures related to undocumented status in this paper, given the minority of surveys that collect these data and limitations in the quality of these data. For multiple reasons, including safety and confidentiality, undocumented status is rarely asked of survey respondents. Especially in the current political climate, individuals may be particularly hesitant to reveal or accurately report their documentation status.⁵³ Without these data, it is and will continue to be challenging to assess the health status of this population and meet their varied and changing needs. We encourage researchers to continue employing innovative methods to estimate undocumented status.⁵⁴

Recommendations. This paper brings to bear areas for improvement in future study design, data collection, and analysis in order to advance our understanding of immigrant SRH. For example, research on immigrants and their generational- as well as ethnicity-specific subgroups is often limited due to small sample sizes. In response, we echo previous recommendations to employ oversampling techniques and pool waves of data, when appropriate, to power subgroup analyses sufficiently.^{5,6} We also encourage wider use of local-level data sources, in addition to national datasets, to study immigrant SRH. State- or county-level data may better address research questions on specific immigrant

populations given geographic clustering of these groups. Increased and ongoing collection of longitudinal data could also assess changes in health behaviors and outcomes over immigrant generations and include data on recently emigrated families.

There is also a need for more comprehensive data on immigrants and their SRH. Future health surveys should consider collecting a minimum set of data on immigrant status, race and ethnicity, and SRH. For example, factors related to generational status such as year of arrival, length of stay, respondent and parent nativity, and ancestry may be useful to assess immigration context.^{12–18,55} Measures of language proficiency should also be collected more consistently and with increased specificity. Indeed, limited English proficiency can impede access to care and exacerbate other nonfinancial barriers.⁹ We also recommend collecting race, ethnicity, and country of origin data with as much specificity and granularity as possible given the heterogeneity of the immigrant population and of immigrants' experiences.

Furthermore, there is a distinct lack of data on SRH coverage, care, behaviors, and outcomes in the immigrant population; only two (NSFG and Add Health) of the national surveys reviewed in this paper collected information on each of these topics. Without these data, disparities in SRH service use and access may remain hidden within the immigrant population and between immigrants and non-immigrants. Instead, future research efforts on immigrant health, generally, and SRH, specifically, should make sure to collect data related to use of and access to health insurance status, contraceptive counseling and services, screening for reproductive cancers, STI prevention and treatment, gynecological and obstetric services, and abortion. These data are particularly important given mounting legal and logistical barriers to obtaining reproductive health care in the U.S., combined with enforcement of immigration policies, which may uniquely target and affect immigrants' access to SRH care. Furthermore, data efforts that allow for the exploration of how individual, interpersonal, community, and structural factors influence different immigrant women's SRH experiences, decisions, and outcomes could also help inform policies and protocols that both enhance and safeguard immigrant women's access to and use of SRH services as well as their wellbeing more broadly.

In general, there is a critical need for data sources to include measures of immigration *and* SRH. However, it is also important to note that data collection, on any topic, can be highly sensitive for immigrants in the United States. Fear of legal backlash in the current political environment may deter immigrants, regardless of documentation status, from disclosing personal information. Study participation may be further limited due to linguistic barriers or—specifically related to SRH research—the cultural stigma associated with topics such as sex, pregnancy, and abortion.⁵⁶ In order to mitigate some of these concerns and increase the quality and quantity of immigrant SRH data, future research may consider adapting the language, tone of survey questions, and translation of instruments to meet the needs of specific immigrant groups more adequately, while also protecting their confidentiality. Involving and engaging immigrant populations throughout the research process—from formulating research questions and survey instruments to data collection, analysis, and dissemination—is also critical to developing relevant and culturally competent research.^{7,57,58} These efforts can contribute to a better understanding of the sexual and reproductive health of immigrant groups,

which, ultimately, will help inform programs and policies that aim to improve the overall health and wellbeing of the U.S. population.

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