Leveraging American Community Survey (ACS) Data to Address Social Determinants of Health and Advance Health Equity

Prepared by State Health Access Data Assistance Center at the University of Minnesota

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Introduction

State Medicaid programs are increasingly seeking to understand and address social factors that contribute to poor health—such as food insecurity, unstable housing, and a lack of access to social supports—in order to lower costs, improve outcomes for their members, and advance health equity.[1] Health equity can be defined as when "everyone has a fair and just opportunity to be as healthy as possible. This requires removing obstacles to health such as poverty, discrimination, and their consequences, including powerlessness and lack of access to good jobs with fair pay, quality education and housing, safe environments, and health care."[2] To inform this work of addressing the social determinants of health (SDOH) and advancing health equity, states and Medicaid officials need data in order to identify priority areas of unmet social and economic needs, execute SDOH initiatives, and monitor and evaluate the impacts of these programs.

Increasingly, states are leveraging a broad array of data sources to support efforts to address health equity (see Table 1). While those sources closest to the Medicaid program are the most widely used, each has advantages and disadvantages. Data from providers are extremely rich but can be challenging to collect and extract information in a uniform way. Similarly, while data from other state agencies have great depth (e.g., incarceration history, housing history, information on food security), using them may require lengthy data use agreement (DUA) negotiations, and matching individuals across agencies can be complex. Commercial data can provide insights on comparison populations (e.g., those with employer-sponsored insurance) or fill other data gaps (e.g., information on patient or consumer preferences), but it can be expensive to obtain and analyze.

Federal survey data also have important advantages and disadvantages. For example, survey data cannot provide direct information about the service use of people enrolled in Medicaid; however, the data are broad in scope, easy to access, and able to support population-level analysis. In addition, while obtaining complete information on race, ethnicity, and language (also known as "REL" data) continues to be challenging for providers and insurers, federal surveys have adapted a variety of techniques (such as detailed probes and imputations) to improve the reliability and consistency of this information.[3] This makes federal survey data particularly valuable for understanding and developing strategies that address health equity. When used as part of a broader data strategy, federal survey data can be a powerful additional tool for Medicaid programs seeking to measure social determinants of health in ways that can guide efforts to address health equity.

Table 1. Data Sources and Types

Medicaid	Providers/MCOs	Other State Agencies	Commercial Data	Population-Based Surveys
› Administrative/ enrollment/ financials › Claims/encounters	› EHR/clinical data › Patient satisfaction surveys › Targeted screening tools	› Use/access to housing support › Use/access to food supports › Incarceration/justice system involvement	› Claims for non-Medicaid populations › Consumer preference data	› Federal surveys (ACS, CPS, NHIS) › State-administered surveys

In this brief, we focus on how Medicaid programs can use data from one federal survey, the American Community Survey (ACS), to inform and target interventions that seek to address social determinants of health and advance health equity. We focus on the ACS because it contains content relevant to a range of social determinants of health, such as housing, income, and food supports, and has a large sample size that supports estimates for smaller subpopulations

and geographic areas. This brief also highlights relevant examples from states that use SDOH and health equity measures from the ACS, including which measures and what they are used for.

ACS Content Relevant to SDOH and Health Equity

The ACS contains a broad range of content relevant to social determinants of health and health equity. Relevant topic areas are laid out in Table 2. The rich demographic data (such as income, race/ethnicity, and age) available in the ACS also supports stratifying results for key subpopulations, which is crucial for understanding and monitoring efforts to address health equity.

The ACS also provides considerable depth and flexibility for users to select, refine, and combine multiple variables to best meet their analytic purposes. Table 3 provides information about the variables, definitions, and detailed response categories related to race/ethnicity. As the table demonstrates, users can choose between variable coding that is "rolled up" to reflect the most commonly reported responses and much more detailed codes that allow for drilling down to very specific groups. A data dictionary containing similar information for all relevant variables is available in the Excel toolkit.

One way that states can consider using the ACS data is to better understand issues related to health equity and social determinants of health for key subpopulations. For example:

› How do issues of housing stability vary by time in the U.S. for immigrant populations? How could this information be used to better target information and resources about housing supports?

› Do rates of participation in food and income supports differ for populations that are linguistically isolated? What information about primary language is available to better target outreach information for these programs?

› What variation exists on key outcomes by country of origin within a state's Hispanic/Latino population? How could this be used to better target and partner with relevant community resources?

This type of population-level analysis can be operationalized with the ACS microdata, which are data files that contain individual-level information for each survey respondent (see more about accessing and using ACS microdata in the sidebar).

ABOUT THE AMERICAN COMMUNITY SURVEY

The American Community Survey (ACS) is a general household survey conducted by the U.S. Census Bureau. It includes data on income, poverty, disability, marital status, education, employment, travel to work, health insurance coverage, housing, and other factors. ACS data are collected on an ongoing basis using monthly mailings to a sample of approximately 3.5 million U.S. households, yielding about 3.2 million individuals. The ACS collects sample data in all 3,141 counties (or county equivalents) in the United States every year. Participation in the survey is required, and the response rate is high—93.7 percent in 2017.[10]

ACCESSING AND USING ACS MICRODATA

Users can download ACS microdata directly from the *Census Bureau*, along with code to process the data. Data are updated annually between September and December; the most recent data available now are for 2018.

IPUMS at the University of Minnesota makes harmonized versions of the ACS files, along with enhanced documentation, available to users at no cost. Users can generate extracts for specific years and variables of interest, which, along with the detailed documentation and harmonized variables, can save considerable time in processing and managing the data. IPUMS releases harmonized versions of the ACS after the data are available from the *Census Bureau*; the most recent data available now are for 2017.

The data dictionary available in the *Excel toolkit* is based on documentation from the 2017 ACS file available through IPUMS.

Researchers at SHADAC are also available to provide tailored, one-on-one technical assistance to state analysts working with the ACS microdata.

Table 2. ACS Content Relevant to SDOH and Health Equity

Demographic	Social	Economic	Housing
Race/Ethnicity	**Disability**	**Income/Poverty Status**	**Type and occupancy**
Age	› VA-related	› Family level	› Type (multi-unit, mobile home, group quarters)
Citizenship	› Type (cognitive, vision, hearing, other physical self-care)	› Health insurance unit (to determine eligibility for Medicaid and subsidies)	› Owner/renter
› Place of Birth			› Time at address
› Ancestry	**Educational Attainment**	**Employment**	
› Year of Entry	**Health Insurance**	› Status	**Housing Costs**
Language		› Labor force participation	› Monthly rent
› Spoken at home			› Monthly ownership costs
› English proficiency		**Other public programs**	› Annual heating costs
› Linguistic isolation		› Income support	› Annual water costs
Migration		› Supplemental Nutrition Assistance Program (SNAP)	**Technology/Communication**
› Moved within same state, from another state, or abroad in past year		**Transportation**	› Phone
		› Vehicles available	› Computers/other devices
Household makeup		› Commuting to work	› Internet connectivity
› Single-parent families			**Housing conditions**
› Multifamily households			› Kitchen facilities
			› Refrigerator
			› Plumbing facilities
			› Bathtub or shower
			› Piped water
			› Rooms per person (crowding)

Table 3. ACS Variables Related to Race/Ethnicity

Variable(s)	Definition	Response Categories	Notes
RACE	Self-reported race	› White › Black/African American › American Indian or Alaska Native › Chinese › Japanese › Other Asian or Pacific Islander › Other race › Two major races › Three or more major races	Analysts frequently collapse categories and combine with ethnicity (HISPAN) to create race/ethnicity variables with fewer categories and/or categories that are mutually exclusive. Users can also choose to view the detailed codes, which include up to 252 categories depending on the year.
RACAMIND **RACASIAN** **RACOTHER** **RACBLK** **RACWHT** **RACPACIS**	Bivariate indicator of whether person reported a specific race	› No › Yes	These variables can be used in combination with RACNUM to identify specific race combinations.
RACNUM	Total number of major race groups reported	› One to six	Major race groups include: American Indian, Asian, black, Native Hawaiian or other Pacific Islander, white, and some other race.
HISPAN	Identifies persons of Hispanic/Spanish/Latino(a) origin and classifies based on country of origin when possible	› Not Hispanic › Mexican › Puerto Rican › Cuban › Other › Not Reported	Users can also choose to view the detailed codes, which include up to 59 categories depending on the year.

Source: SHADAC review and compilation of IPUMS documentation of the 2017 ACS data file.[4]

Strategies and Tools for Examining Smaller Geographies with the ACS

As we discussed above, one of the key advantages of the ACS is its large sample size that supports analysis by key subpopulations such as age, race/ethnicity, income, and educational attainment. ACS microdata can be used to examine estimates for these populations at the state level. However, there may be instances where states would prefer to have information for smaller geographic areas such as counties, ZIP codes, or block groups. Examples of questions and related interventions that may benefit from more granular geographic estimates of content related to SDOH include:

› **Housing:** Which geographic areas contain higher concentrations of populations that spend more than 30 percent of income on rent/housing costs; have high percentages of renters or individuals with short housing tenures; and/or live in housing with incomplete plumbing or in crowded conditions? *This information could be used to target outreach efforts about available housing support and to target resources for more intensive provider screening related to housing*.

› **Transportation:** Which geographic areas contain higher concentrations of individuals that report not owning vehicles? *This information could be used to communicate about Medicaid non-emergency medical transportation benefits and other transportation programs and to target resources for more intensive provider screening related to transportation needs.*

› **Nutrition:** Which geographic areas contain higher concentrations of people who report using food stamps/SNAP, appear to be eligible for SNAP but not receiving it, and/or report incomplete or a lack of kitchen facilities in their housing? *This information could be used to communicate about SNAP and community-based organizations such as food pantries and to target resources for more intensive provider screening related to food insecurity.*

› **Communication needs:** Which geographic areas contain higher concentrations of people who report limited access to computers, internet, and/or phone services (which are essential tools for accessing information about health care and communicating with providers)? *This information could be used to target access to key information in other ways (e.g., in person or by phone) and/or to provide patients and their families information about accessing public spaces with computer resources, such as libraries.*

In these cases, analysts can leverage pre-tabulated estimates produced by the Census, also known as "summary data." The Census produces summary tables using both single-year and five-year data files. The five-year files are updated annually, with the most recent available file containing data from 2014 to 2018. Certain smaller geographic estimates (such as ZIP codes, census tracts, and block groups) are only available from tables based on five years of data. Table 4 below provides an overview of the substate geographic estimates available from both one- and five-year tables.

STATE HEALTH COMPARE

SHADAC's online data tool, ***State Health Compare***, allows users to generate state-level estimates of select SDOH-related factors from the ACS, including:

› The share of children living in poverty

› The percent of rental households that spend more than 30 percent of their income on rent (unaffordable rents)

The child poverty measure can be stratified by detailed race/ethnicity categories, and the unaffordable rents measure can be stratified by income, disability status, metropolitan status, and whether anyone in the household is enrolled in Medicaid.

SHADAC is continuing to add measures to ***State Health Compare*** that relate to SDOH and health equity, and researchers are available to provide one-on-one technical assistance to state analysts who wish to use the ACS to produce additional measures or breakdowns.

Table 4. Substate Geographic Areas Available in ACS One-Year and Five-Year Summary Tables

Geography	Total	One-year	Five-year
Congressional Districts	435	All	All
Metro & Micro Statistical Areas	929	56%	All
Counties	3,220	26%	All
School Districts	13,642	7%	All
Zip Code Tabulation Areas	33,120	None	All
Census Tracts	74,001	None	All
Block Groups	220,333	None	All

Source: U.S. Census Bureau. (2018). *Understanding and Using American Community Survey Data: What All Data Users Need to Know*. Retrieved on November 1, 2019 from https://www.census.gov/content/dam/Census/library/publications/2018/acs/acs_general_handbook_2018.pdf.

There are some important pros and cons to consider when using geographic estimates based on five years of data. For example, users may want to weigh how the need for more granular data compares to the potential for changes to be masked when combining multiple years of data. Pooled year estimates may be better suited to questions that address characteristics that are relatively stable—such as poverty—than issues that are likely to shift more quickly, such as computer and internet access. Estimates at lower levels of geography will also often be less precise, so we recommend that analysts apply some criterion for when to suppress estimates; for example, if the relative standard of error exceeds 30 percent or if the denominator is fewer than 50 cases.

Some online tools provide interactive access to the five-year ACS estimates related to SDOH and health equity. These types of tools can be particularly helpful when doing exploratory research about where to target a particular intervention or to provide preliminary framing for more in-depth analysis. The Vulnerable Populations Footprint, made available by the Center for Applied Research and Data Systems, includes a comprehensive set of indicators from the five-year ACS summary tables. Users can generate interactive maps of single metrics or use the tool to set thresholds for multiple metrics (e.g., percent living in poverty and percent with a high school education or less) to see relevant "hot spots" in a state or region. A list of the indicators available on the site, along with information about the most granular geographic data available (e.g., county, census tract) is available here.

In some cases, users may prefer to access the summary data tables directly from the Census. This may be helpful if analysts want to pull down data from multiple tables, do additional analysis (such as aggregating across categories or performing tests), or include data as inputs to statistical modeling (see sidebar for information about accessing data directly from data.census.gov). A list of tables with information about the relevant universes and availability of one- and five-year estimates is also included as a separate tab in the Excel toolkit here.

ACCESSING AND USING ACS SUMMARY DATA

Users can download ACS tabular data directly from the U.S. Census Bureau using their new tool at *data.census.gov*.

Users can select tables by topics, change geographies, and download data in PDF or CSV file formats. The most recent tabulations available are for 2018.

Researchers at SHADAC are also available to provide tailored, one-on-one technical assistance to state analysts working with the summary data. We can help identify tables and advise on strategies to pull down tabular data and manipulate it in statistical programs such as STATA.

ACS Data in Action: State Examples

Some states are already using ACS data to inform population-level approaches to addressing SDOH and health equity. For example, both New Hampshire[5] and Vermont[6] are using the Social Vulnerability Index (SVI) to identify areas in need of additional assistance in the event of a disease outbreak or other emergency. The SVI measures poverty, unemployment, income, education, and uninsurance at the census tract level.[7]

Massachusetts also leverages ACS data to calculate a "Neighborhood Stress Score," which is used in its model to risk-adjust payments to Medicaid managed care organizations and accountable care organizations.[8] In Washington, ACS data are used in an online dashboard to compare characteristics across the geographic areas associated with each of the state's Accountable Communities for Health (ACH). The ACHs bring together health sectors across the state to engage in transformation projects to promote health equity.[9]

Table 5 below crosswalks specific measures used in each of these initiatives. There is quite a bit of overlap in the ACS measures in use across these examples, and consistency in how certain concepts—such as educational attainment and unemployment—are classified. However, there is more variation in the type and granularity of data used for other factors, such as poverty, relevant housing characteristics, and classification of race/ethnicity. As these examples illustrate, the ACS provides states with considerable flexibility to tailor analyses to meet specific policy and operational goals.

Table 5. State Examples: Use of SDOH and Health Equity Measures from the ACS

Measure	Social Vulnerability Index (VT & NH)	MA Risk Adjustment Neighborhood Stress Score	WA Accountable Communities for Health
Race/ethnicity	Percent minority (all except white non-Hispanic)		Used to stratify results. Shows seven single race categories, Hispanic, other race, and multiple race.
Poverty	Below poverty	Below poverty Below 200% poverty	Below 125% poverty
Per capita median income	X		
Unemployed (age 16+)	X	X	X
Uninsured			X
Receiving public assistance		X	
Civilian with a disability	X		
No high school diploma	X		X
Single-parent households	X	X	
Speaks English "less than well" (age 5+)	X		X
No vehicle available in the household	X	X	
Crowding (>1 person per room)	X		
Living in multiunit structures	X		
Living in institutionalized group quarters	X		
Living in mobile homes	X		

Source: SHADAC review and compilation of measure documentation from sources cited above.

Conclusion

The American Community Survey (ACS) contains content relevant to a range of social determinants of health, and the large sample size, particularly when pooling years, can be leveraged to produce estimates for key subpopulations and geographic areas. When used as part of a broader data strategy, data from the ACS can be a powerful additional tool for Medicaid programs seeking to measure social determinants of health in ways that can guide efforts to address health equity. SHADAC researchers are available to provide tailored, one-on-one technical assistance to states seeking to leverage ACS data for these purposes.

Endnotes

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