



## **Estimating SCHIP/Medicaid Eligible but Not Enrolled at the County Level**

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### **Introduction**

Key to increasing access to health insurance coverage for uninsured children, is knowing who is already eligible but not enrolled in existing programs. Medicaid provides coverage for very low-income children while the Children's Health Insurance Program (CHIP) provides coverage for children with incomes too high to be eligible for Medicaid but still too low to afford private coverage. While these programs are operating in all 50 states and the District of Columbia it is estimated that approximately 70% of all uninsured children are eligible for either Medicaid or CHIP (Dubay, Holahan, and Cook 2007).

The 2009 Children's Health Insurance Program Reauthorization Act (CHIPRA) provided additional funding for enrollment activities, including \$100 million in outreach grant funding and an enhanced federal match for translation and interpretation services. The outreach activities include new grants to "...eligible entities during the period of fiscal years 2009 through 2013 to conduct outreach and enrollment efforts that are designed to increase the enrollment and participation of eligible children under CHIP and Medicaid," and a 10 percent state-aside of funding for a national enrollment campaign (P.L. 111-3).

Many states analysts are interested in understanding the number and characteristics of the eligible but uninsured children to better target outreach and enrollment initiatives. Estimating this number at the state and sub-state level (i.e., county) can be difficult, especially for states and counties with large geographic areas and smaller populations. SHADAC has worked with Colorado to develop a possible model-based approach for developing estimates of eligible but not enrolled children at the state and county levels using Medicaid/SCHIP enrollment and survey data.

### **Overview of the Process**

Estimating the number of SCHIP/Medicaid eligible children in all of a state's counties involves estimating both the number of children currently enrolled and the number eligible but not enrolled in each of the counties in a state. Estimating the number of children currently enrolled in SCHIP and Medicaid requires a query of the state-level SCHIP/Medicaid enrollment files.

Estimating the number of eligible but not enrolled children is significantly more difficult. Appropriately developing the estimate requires comprehensive data on children in every county in the state. These data need to describe detailed sources and amounts of family income, family expenses (such as child care), family relationships between everyone in the household, citizenship status of the child, and the length of time a non-citizen has legally been in the country. The analyst needs information on all of these variables in addition to a reasonably large sample of children in each county (e.g., 300-400) to make reliable county-level estimates. A comprehensive data file with this information does not yet exist; therefore analysts need to collect and compile available data to estimate the number of uninsured SCHIP/Medicaid-eligible children by county.

## SHADAC Estimation Approach for Eligible by Not Enrolled Children

In this approach determining the number of children eligible for SCHIP/Medicaid in a state's counties is a two-phase process to reflect the two components of the eligible population: (1) those currently enrolled, plus (2) those eligible but not enrolled. As describe above, the analyst can use current state enrollment files to determine a count of the number of children enrolled in SCHIP/Medicaid. The analyst can then use recent survey data from the American Community Survey (ACS) to estimate the number of eligible but not enrolled children for the state's SCHIP/Medicaid program. These two counts are then added together for an estimate of the total number of children eligible for SCHIP/Medicaid in all the counties in a state at a point in time. Both phases are described in detail below.

ACS Survey data become available during the fall of each year, making this a good time for the analyst to establish a process of updating the previous year's estimate. The estimate will be derived using data that represents the preceding calendar year. For example, in fall of 2009 the data from calendar year 2008 can be used to estimate the number of eligible children for a state's SCHIP/Medicaid. However, ACS estimates are not available for every county in the state. In Phase 2, below, we describe a technique to develop proxy estimates for each county.

### **Phase 1:**

Using the SCHIP/Medicaid enrollment data, determine the average monthly enrollment for the SCHIP/Medicaid program by county within a state for the calendar year for which the estimates are needed.

### **Phase 2:**

Step 1: Obtain the most recent county population estimates from the U.S. Census Bureau. The estimates are updated each spring by the Census Bureau and represent the population by age, sex and race as of July 1 during the preceding calendar year. Obtain from these tables the number of children in the county age 0-18. The state and county population estimates can be downloaded from the following web site: <http://www.census.gov/popest/estimates.php>

Step 2: Download the American Community Survey (ACS) microdata from the IPUMS web site. These data are released each fall, represent the preceding calendar year, and are available at: <http://usa.ipums.org/usa/>

County-level data are not available in the single-year ACS. The county information needs to be approximated using the public use microdata area (PUMA), which is the lowest level of identifiable geography in the single year ACS data. These are population areas with 100,000 or more population, and generally correspond with one or more counties. In areas with high population density the boundaries may not coincide with counties.<sup>1</sup> The estimation technique described here assumes that you will develop estimates for each PUMA in the state and apply those as a proxy for the counties within that PUMA.

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<sup>1</sup> A description of the PUMA guidelines and assignment process is at: <http://www.census.gov/geo/puma/puma2000.html>. For a map of PUMAs available in the states see: <http://usa.ipums.org/usa/volii/2000pumas.shtml>

For each PUMA in the state determine the proportion of children who are income eligible for SCHIP/Medicaid, who are uninsured, and who are U.S. citizens or qualified aliens. Use these guides to develop specific parameters:

Income Eligibility: From the ACS microdata estimate the percent of children 0-18 who have family incomes between 0% of the federal poverty level (FPL) and the maximum percent of the federal poverty level for eligibility in SCHIP/Medicaid for that state.

Citizenship and Qualified Aliens: To be a qualified alien a child must be a legal resident of the U.S. for at least five years. However, the survey only asks about length of time in the U.S. You cannot determine whether a non-citizen has resided in the U.S. legally during that time. One simple approach for dealing with this deficiency in the data is to follow these steps.

1. Use the ACS microdata to estimate the percent of kids in each PUMA that are in the eligibility income range and who are not U.S. citizens and who are not likely qualified aliens.
2. Select the subset of these cases that have resided in the country for at least five years.
3. Select these or a subset of these cases and consider them to be eligible.<sup>2</sup>

Uninsured: Beginning with the 2008 ACS, released in September 2009, the ACS public use microdata file has an indicator for health insurance status.

Once the percent of income eligible, uninsured, and U.S. citizens or qualified aliens is determined, multiply this percent for the PUMA in which the county is a member by the number of children obtained in step 1.<sup>3</sup>

The results from phase 1 (which estimates the number of eligible children enrolled) in each county should be added to phase 2 (which estimates the number of eligible who are uninsured). This gives you the total eligible and also the total eligible but not enrolled. These numbers can then be monitored by county over time. Also the estimates from each phase can be tracked separately to evaluate how well the program is performing.

## Potential Model Enhancements

### *Income Adjustment Models*

Determining income eligibility can be complex and many states include income disregards and exempt certain expenses (e.g., child support, child care expenses, alimony) when calculating income in order to meet eligibility income limits. By not making these adjustments to income the analyst will likely estimate fewer people to be eligible than actually are eligible. However, child support, alimony and child/elder daycare expenses are not included on survey data and these types of adjustments would need to be applied through statistical simulation in order to develop a more sophisticated eligibility

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<sup>2</sup> For an example see Dubay, Haley and Kenney 2002.

<sup>3</sup> Some large population counties are divided into multiple PUMAs. For example, Multnomah County, OR is divided between three PUMAs. Disaggregated sub-county estimates are possible or you can just run the rate for the whole county. Also some counties are divided into two separate PUMAs (part of a county is in one PUMA and part is in another PUMA). In this case some type of weighted estimate of the population should be used. This will need to be developed from decennial census data (either 2000 or 2010 once that becomes available).

model. To have this done appropriately would cost significantly more than the model discussed above.<sup>4</sup> For an excellent example of a very complex and very expensive model please see the detailed information on TRIM model adjustments currently being made by the Urban Institute (Urban Institute 2008).

### ***Small Area Estimation***

Another approach that could be fruitful and differs dramatically from the approach suggested above is to use a small area model-based estimation approach. Small area estimation is an appealing technique and it has many advantages and some disadvantages for the purpose of estimating the number of SCHIP/Medicaid eligible children in each county in a state.

Small area model-based estimation uses existing auxiliary data from the U.S. Census Bureau, Bureau of Labor Statistics, Health Resources and Services Administration and other sources, to develop a model of how many children in each county are eligible for SCHIP/Medicaid. Examples of small area models of this type include the Small Area Income and Poverty Estimates (SAIPE) from the Census Bureau or from the Bureau of Labor Statistics Local Area Unemployment Statistics (LAUS) estimates.<sup>5</sup> This approach can also be very costly due to the intensive statistical analysis involved in this type of small area estimation modeling.

In fall of 2013 the ACS will produce summary tables of health insurance coverage for every county in a state, based on five-year averages. It would be worth investigating the development of small area estimation techniques to improve the model using this county specific information. This is advantageous over the approach outlined in this paper because it will address between-county variation within PUMAs. Given the rapid changes in the types of data that will become available over the next five years, we would recommend not investing time and money into this effort until the county data for all counties are available in 2013.

A final option would be to access the restricted ACS data file at a Census Bureau Research Data Center (RDC).<sup>6</sup> The restricted data file identifies all counties and county equivalents in the U.S. Various small area estimation techniques could then be used to estimate eligible but unenrolled children in counties that have low observation counts (less than 300-400). Such estimation methods include those described above, and Bayesian techniques that have been shown to yield equally valid estimates with considerably less computational effort. This method would also be costly to develop due to the intensive statistical analysis time and logistical restrictions of conducting research at an RDC. However, after the first attempt the application process would become routine and require less effort in ensuing years.

For more background on small area analysis as used for policy specific purposes please see SHADAC's issue brief on the topic, and our technical brief describing the SAE procedure used for the 2008 Oklahoma Health Care Insurance and Access Survey (State Health Access Data Assistance Center 2002, 2009).

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<sup>4</sup> A simpler approach could be to just widen the FPL bands to be up to 225 in the model even though they are officially set at 205% of FPL to adjust for earnings disregards and expenses.

<sup>5</sup> For examples of small area estimation this type of work see: <http://www.bls.gov/LAU/> and <http://www.census.gov/hhes/www/saipe/>

<sup>6</sup> Information on Census Bureau RDCs and locations is available at: <http://www.ces.census.gov/index.php/ces/researchprogram>.

## **General Data Limitations of Eligibility Models**

### ***Income Measurement***

There are three major problems that should be noted in using income data for eligibility modeling, as measured in surveys such as the ACS and Current Population Survey (CPS). First, the reference period of the income items may not match the actual reference period used for program eligibility determination.

The CPS measures income for the entire past calendar year, while the ACS (which is fielded every month of the year) asks about income for the past 12 months. SCHIP eligibility is not based on the exact same reference period and some families will have had high incomes last year but due to a layoff or unemployment spell may be eligible at any given point in time. Likewise, people who were eligible based on last year's income may not be eligible at a given point in time as their income may have gone up significantly or they may have found a new job (if previously unemployed or laid off). This would lead some people you determine to be "eligible" to actually be ineligible at any given point in time. Given how eligibility determination works at enrollment, more people will be eligible at some point in time during the year than we will estimate.

The second problem with using survey income data is that some respondents do not provide income data on the survey. Anywhere from 15-25% of the income data will be missing, depending on how the data are collected and/or edit. Income data are imputed on both the ACS and the CPS surveys, and there may be problems using these data to the extent that the imputation processes does or does not reflect eligibility.

The third problem is that there is a substantial amount of measurement error in self-reported income data. This error usually presents itself as an underestimation of income relative to administrative data sources (Moore, Stinson, and Welniak 2000).

### ***Issues with Measuring Health Insurance Coverage***

Health insurance is a complex and time-varying concept that is difficult to measure. The most well known problem with coverage estimates is known as the "Medicaid undercount." This phenomenon describes the tendency of survey results to underestimate enrollment in Medicaid when compared to administrative records. This undercount not only produces biased Medicaid estimates, but artificially biases upwards the estimates of uninsurance and private coverage (Davern et al. 2009; Call et al. 2008).

The Medicaid undercount is caused by two things. The first cause is associated with eliminating duplicative counts and otherwise aligning the Medicaid administrative data counts to match the ACS/CPS sample frame. For example, Medicaid administrative data will include the same person twice if they lived in more than one state and were enrolled in Medicaid in both, but the ACS/CPS will only count them in one state.

The second cause is reporting error on the part of respondents. For example, matching studies suggest that 43% of the CPS sample who appeared to have been enrolled in Medicaid at some point over the prior year according to the administrative data files, do not indicate that they have had Medicaid coverage over that time frame (State Health Access Data Assistance Center 2008). Twenty-four percent respond that they have another type of coverage but 17% report being uninsured. It is likely that this type of measurement error will be much lower on the ACS than on the CPS since the ACS relies on a point-in-time measurement as opposed to the "any time in the past year" measurement on the CPS

(Call, Davern, and Blewett 2007). Due to the Medicaid Undercount we will likely count many children as being eligible for SCHIP who are actually enrolled in Medicaid or SCHIP but answered the survey as though they were uninsured (Call et al. 2008).

One fix for this could be to have the Census Bureau match the ACS with the Medicaid administrative data and to produce a model that can be used to partially correct the ACS for misreporting of insurance status as Davern et al did for the Current Population Survey using a model developed on linked CPS and Medicaid enrollment data (Davern, Klerman, Ziegenfuss 2007). However, this is currently not available.

### **Geography**

The PUMA geography may not be a reliable proxy for county. Conceivably there may be variation in the proportion of uninsured children, average family income, and proportion of citizens/qualified aliens for every county a PUMA. In these cases the PUMA estimate will not account for the differences. These geographic limitations of the data may be impossible to overcome without a considerable investment in ongoing state-specific surveillance.

### **Conclusion**

This brief provides a methodological description for one possible technique to assess the number of eligible but uninsured children in counties. These techniques are imprecise, but nevertheless have been useful for analysts. An example of one application used in Colorado may be worth review (Colorado Health Institute 2009). Note the Colorado analysis used the CPS health insurance estimates because, at the time, ACS estimates were not available. SHADAC recommends using ACS data for calendar year 2008 and later.

### **Suggested Citation**

State Health Access Data Assistance Center. 2009. "Estimating SCHIP/Medicaid Eligible but Not Enrolled at the County Level." Minneapolis MN: University of Minnesota.

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