

Technical Specifications: Rate of ED Visit Use for Children Managed for Identifiable Asthma

Calculation

- a. Step 1: Measure person-time eligible for each patient and record by month.
 - i. a. For each month in the reporting year, identify all children ages 2 – 21 years who meet the criteria for Identifiable asthma during the assessment period. The assessment period is defined as the year prior to the reporting year plus all months in the reporting year prior to the reporting month.

Identify and maintain a unique patient identifier and all stratification variables.

To illustrate: if the goal is to report for January 2011, first one would identify children with Identifiable asthma using the criteria, and analyze all of calendar year 2010 when doing so. Continuous enrollment criterion requires that the child was enrolled in November and December of 2010, as well as January 2011. This total represents the number of person-months (child-months) for January.

Next, for February: one would identify children with Identifiable asthma using the criteria, and analyze all of calendar year 2010 AND January 2011 when doing so. Continuous enrollment criterion requires that the child was enrolled in December 2010 and January 2011, as well as February 2011. This is the number of person-months (child-months) for February.

Repeat this progression monthly so that for December, one would identify children with Identifiable asthma and analyze all of calendar year 2010 AND January through November 2011 when doing so. Continuous enrollment criterion requires that the child was enrolled in October 2011 and November 2011, as well as December 2011. This is the number of person-months (child-months) for December.

- ii. Sum all months that are eligible from the reporting year. This sum is the denominator in people-months. Divide by 1200. This is denominator in 100 people-years. This is the denominator for the year.
- b. Step 2: Month by month, considering the definitions above, identify the number of discrete numerator events that occur in children eligible in that specific month:
 - i. Identify the number and date of ED visits with asthma as a primary or secondary diagnosis among those children who are eligible for that reporting month.
 - ii. Identify the number and date of inpatient hospitalizations with asthma as a primary or secondary diagnosis among those children who are eligible for that reporting month.
 - iii. Identify the number of discrete numerator events. Consecutive days with inpatient hospital codes are considered one hospitalization. Hospitalizations on day of or day after ED visit are NOT considered discrete from the ED visit.
 - iv. Sum the number of numerator events across the year.
 - v. Maintain stratification variables and unique identifiers.
- c. Step 3. Calculate rate as Numerator / Denominator. While this measure is specified for the year, it has also been validated to demonstrate seasonality using monthly rates.
- d. Step 4. Calculate stratification variables as specified.

This measure calls for stratification by age group, by race/ethnicity, and by age group and race/ethnicity. Several additional stratifications are recommended but optional. These may be required by the accountability entity or reported by the reporting entity. These variables include rurality/urbanicity and county level of poverty.

- i. Age groups are 2-5, 6-11, 12-18, and 19-20, each inclusive. (reporting entity should specify whether to use age at month of qualifying event or age on first day of reporting year)
- ii. Race/ethnicity should include White non-Hispanic, Black non-Hispanic, and Hispanic as well as other groups as requested by the accountability entity and consistent with current HHS usage.
- iii. For social demographic stratification: identify County equivalent of child's residence. If County and State or FIPS code are not in the administrative data, the zip codes can be linked to County indirectly, using the Missouri Census Data Center (<http://mcdc.missouri.edu/>). These data will link to County or County equivalents as used in various states.

1. Identify the Urban Influence Code (1) or UIC for the county of child's residence. (2013 urban influence codes available at: <http://www.ers.usda.gov/data-products/urban-influence-codes.aspx#.UZUvG2cVoj8>). Use parent or primary caregiver's place of residence to determine UIC. State and county names can be linked or looked up directly or zip codes can be linked to county indirectly, using the Missouri Census Data Center (<http://mcdc.missouri.edu/>). These data will link to county or county equivalents as used in various states.

Urban Influence Codes (UIC) have been developed by the USDA to describe levels of urbanicity and rurality. While each UIC has its own meaningful definition, some researchers choose to aggregate various codes. Well regarded schemas for aggregation of codes include Bennett and colleagues at the South Carolina Rural Research Center. Their aggregation scheme brings together Codes 1 & 2 as Urban; 3,5, & 8 as micropolitan rural; 4,6, & 7 as rural adjacent to a metro area; and 9, 10, 11, & 12 as remote rural. We acknowledge that UIC 5 (adjacent rural area) may appropriately be aggregated with 4,6,&7 as rural. Frontier health care may be approximated by analysis of the remote rural categories (UIC 9, 11 and 12). Alternatively, Gary Hart, Director of the Center for Rural Health at the University of North Dakota School of Medicine & Health Science suggests that UIC 9-12 is the best overall approach to using county level data to study frontier health. Inclusion of UIC 8 would make the analysis more sensitive to including frontier areas but at a meaningful cost in specificity.

Those interested in care specific to large cities may wish to aggregate the rural area and analyze UIC 1 and 2 separately.

When stratifying by urbanicity or UIC, the reporting and accountability entities should specify clearly what if any aggregating schema was used.

2. Identify the Level of Poverty in the child's county of residence. The percent of all residents in poverty by county or county equivalent are available from the US Department of Agriculture at <http://www.ers.usda.gov/data-products/county-level-data-sets/download-data.aspx>. Our stratification standards are based on 2011 US population

data that we have analyzed with SAS 9.3. Using child's state and county of residence (or equivalent) or FIPS code, use the variable PCTPOVALL_2011 to categorize into one of 5 Strata:

- a. Lowest Quartile of Poverty if percent in poverty is $\leq 12.5\%$
 - b. Second Quartile of Poverty if percent in poverty is $> 12.5\%$ and $\leq 16.5\%$
 - c. Third Quartile of poverty if percent in poverty is $> 16.5\%$ and $\leq 20.7\%$
 - d. First Upper Quartile (75th-90th) if percent in poverty is $> 20.7\%$ and $\leq 25.7\%$
 - e. Second Upper Quartile (> 90 th percentile)
3. Categorize age by age at the last day of the month that ends the assessment period. Aggregate into age categories 2-4, ages 5 through 11, ages 12-18, ages 19-21.
 4. Categorize Race/Ethnicity as Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Asian/Pacific Islander, and Non-Hispanic Other
 5. Categorize Insurance Type as Private (Commercial), Public, None or Other
 6. Categorize benefit type as HMO, PPO, FFS, PCCM, or Other
- e. Step 5. Repeat by strata. Within age strata repeat by other specified strata. Perform other cross tabulations as requested by the accountability entity. Eliminate any strata with less than 40 person-months in any month's denominator OR less than 1000 person-months for the year.

Figure 1 illustrates the calculation of person-time and is considered fundamental to this calculation algorithm.

When data cannot be obtained from any source:

- If critical for calculation – delete patient from consideration for that reporting month
- If non-critical for calculation – include patient

Critical data include encounter data for the reporting month and some period of time in the assessment period. In order to report stratifications age and race/ethnicity are considered critical. Pharmacy data are not considered critical