Section I. Basic Measure Information

I.A. Measure Name

CAPQuaM PQMP Asthma II: Distribution of Emergency Department Visit Use for Children Managed for Persistent Asthma

I.B. Measure Number

0124

I.C. Measure Description

Please provide a non-technical description of the measure that conveys what it measures to a broad audience.

This measure describes four aspects of the population of children who have persistent for asthma: the number who have emergency department visits; the distribution of visits; and the number of children with persistent asthma and the amount of time each contributes to the person-time denominator of the incidence rate measure in the same set.

I.D. Measure Owner

CAPQuaM

I.E. National Quality Forum (NQF) ID (if applicable)

N/A

I.F. Measure Hierarchy

Please note here if the measure is part of a measure hierarchy or is part of a measure group or composite measure. The following definitions are used by(AHRQ)'s National Quality Measures Clearinghouse and are available at http://www.qualitymeasures.ahrq.gov/about/hierarchy.aspx:

1. Please identify the name of the **collection** of measures to which the measure belongs (if applicable). A Collection is the highest possible level of the measure hierarchy. A Collection may contain one or more Sets, Subsets, Composites, and/or Individual Measures.

   This measure belongs to the PQMP Measures of Emergency Department Use for Children with Asthma - Process 1 Collection.

2. Please identify the name of the measure **set** to which the measure belongs (if applicable). A Set is the second level of the hierarchy. A Set may include one or more Subsets, Composites, and/or Individual Measures.

   This measure belongs to the PQMP Measures of Emergency Department Use for Children with Asthma - Frequency Set.

3. Please identify the name of the **subset** to which the measure belongs (if applicable). A Subset is the third level of the hierarchy. A Subset may include one or more Composites, and/or Individual Measures.

   This measure comprises the Counting Subset.

4. Please identify the name of the **composite** measure to which the measure belongs (if applicable). A Composite is a measure with a score that is an aggregate of scores from other measures. A Composite may include one or more other Composites and/or Individual Measures. Composites may comprise component Measures that can or cannot be used on their own.

   N/A

I.G. Numerator Statement

This is not a ratio measure. It is comprised of two count measures and two distributions.
The counts are the number of unique children age 2-21 who meet the criteria for persistent asthma and the number who have at least one visit to the emergency department.
The first distribution is the number of visits to the ED experienced by each of these children during the reporting year and is described by the 1st, 10th, 25th, 50th, 75th, 90th, and 99th percentiles of that distribution. The interquartile range should also be reported.

The second distribution is the number of person-months that all children with persistent asthma are eligible for this measure during the reporting year. This should be reported as the 1st, 10th, 25th, 50th, 75th, 90th, and 99th percentiles and the interquartile range.
Persistent asthma is defined in Table 1 in section 2, and the *assessment period i*s defined below.

Person-Time Elements:

1) Age

2) Recent evidence of being managed for persistent asthma in the *assessment period*, including:

- Any prior hospitalization with asthma as primary or secondary diagnosis
- Other qualifying events after the fifth birthday (at time of event):
  - o One or more prior ambulatory visits with asthma as the primary diagnosis, **OR**
  - o Two or more ambulatory visits with asthma as any diagnosis, **OR**
  - o One ambulatory visit with asthma as a diagnosis **AND** at least One asthma related prescription, **OR**
  - o Two or more ambulatory visits with a diagnosis of bronchitis
- Other qualifying events, any age:
  - o Three or more ambulatory visits with diagnosis of asthma or bronchitis, **OR**
  - o Two or more ambulatory visits with a diagnosis of asthma and/or bronchitis **AND** one or more asthma related prescriptions

Notes*:*

The *assessment period* includes the full year before the reporting year and each full calendar month before the month being assessed. If pharmacy data are not available, the measure should be reported with notation that pharmacy data were not used for the assessment of eligibility.
For eligibility purposes, *asthma-related medicine* refers to a long acting beta agonist (alone or in combination) or inhaled corticosteroid (alone or in combination), anti-asthmatic combinations, methylxanthines (alone or in combination), or mast cell stabilizers.

I.H. Numerator Exclusions

Events occurring in patients who do not meet criteria for person-time for the month in which the event occurred.

Events occurring in patients who not have been enrolled in the reporting plan for at least 2 consecutive months before the index reporting month.

Events for which asthma is not listed as the primary or secondary diagnosis.
For the purposes of this measure, asthma diagnosis includes all diagnoses with 3 digit ICD-9 of 493. For entities that prefer to use AHRQ's Clinical Classifications Software, the asthma definition (before exclusions) is CCS class 128.

Exclude for concurrent or pre-existing diagnosis of cystic fibrosis (ICD-9 CM codes of 277.0, 277.01. 277.02, 277.03, 277.09), COPD (3 digit ICD-9 code 496) or Emphysema (3 digit ICD-9 code of 492).

I.I. Denominator Statement

N/A

I.J. Denominator Exclusions

N/A

I.K. Data Sources

Check all the data sources for which the measure is specified and tested.

Administrative Data (e.g claims data), Other (Please list all other data sources in the field below). , If other, please list all other data sources in the field below.

Race/ethnicity Data or Zip code Data (If race/ethnicity data or zip code data are not present in administrative data set, they should be obtained from another source, such as the medical record)

Section II: Detailed Measure Specifications

Provide sufficient detail to describe how a measure would be calculated from the recommended data sources, uploading a separate document (+ Upload attachment) or a link to a URL. Examples of detailed measure specifications can be found in the CHIPRA Initial Core Set Technical Specifications Manual 2011 published by the Centers for Medicare & Medicaid Services. Although submission of formal programming code or algorithms that demonstrate how a measure would be calculated from a query of an appropriate electronic data source are not requested at this time, the availability of these resources may be a factor in determining whether a measure can be recommended for use.

A. Description

This measure describes four aspects of the population of children who have persistent for asthma: the number who have emergency department visits; the distribution of visits; and the number of children with persistent asthma and the amount of time each contributes to the person-time denominator of the incidence rate measure in the same set.

B. Eligible Population

This measure reports how many children have persistent asthma at any time during the year, the number who have a visit to an Emergency Department for asthma in the reporting year, the

distribution of the number of such visits per child, and the number of months in the year that they met both clinical eligibility and consecutive enrollment criteria Descriptive definitions for being managed for persistent asthma are as follows.

Specifications follow the descriptive definitions:

Any prior hospitalization with asthma as primary or secondary diagnosis
Other Qualifying events after the fifth birthday (age is age at event):
One or more prior ambulatory visits with asthma as the primary diagnosis (this criterion implies an asthma ED visit in the reporting month), **OR**
Two or more ambulatory visits with asthma as a diagnosis, **OR**
One ambulatory visit with asthma as a diagnosis **AND** at least one asthma related prescription, **OR**
Two or more ambulatory visits with a diagnosis of bronchitis
Other Qualifying events, any age:
Three or more ambulatory visits with diagnosis of asthma or bronchitis, **OR**
Two or more ambulatory visits with a diagnosis of asthma and/or bronchitis **AND** one or more asthma related prescriptions
For eligibility purposes, asthma related medicine means long acting beta agonist (alone or in combination) or inhaled corticosteroid (alone or in combination), anti-asthmatic combinations, methylxanthines (alone or in combination), and/or mast cell stabilizers.

This is not a ratio measure, so there are no true numerators and denominators. It is comprised of two count measures and two distributions.

The counts are the number of unique children who meet criteria for persistent asthma and the number of those children who have at least one visit to the emergency department.

The first distribution is the number of visits to the ED experienced by each of these children during the reporting year and is described by the 1st, 10th, 25th, 50th, 75th, 90th, and 99th percentiles of that distribution. The interquartile range should also be reported.

The second distribution is the number of person-months that all eligible children with persistent asthma are eligible during the reporting year. This should be reported as the 10th, 25th, 50th, 75th, and 90th percentiles and the interquartile range.

Persistent asthma is defined in Table 1, and the *assessment period i*s defined below.

Person-Time Elements:

1. Age of the child
    2. Recent evidence of being managed for persistent asthma in the *assessment period*, including any of the combinations listed in the descriptive definitions above..:

Notes*:*

The *assessment period* includes the full year before the reporting year and each full calendar month before the month being assessed.

If pharmacy data are not available to be used, the measure should be reported with notation that pharmacy data were not used for the assessment of eligibility.

Table 1. Children meeting the criteria for having persistent asthma can by identified by the following:

Criteria for assessing "persistent asthma" (Evidence must include all readily available data regarding whether or not a child used a service. CPT and revenue codes are indicated as appropriate.)	**Codes**
Hospitalization	**CPT Codes:** CPT 99238 CPT 99232 CPT 99239 CPT 99233 CPT 99221 CPT 99234 CPT 99222 CPT 99235 CPT 99223 CPT 99236 CPT 99356 CPT 99218 CPT 99357 CPT 99219 CPT 99231 CPT 99220 **Or Revenue Codes:** 0110 0133 0111 0134 0112 0137 0113 0139 0114 0150 0117 0151 0119 0152 0120 0153 0121 0154 0122 0157 0123 0159 0124 0200 0127 0201 0129 0202 0130 0203 0131 0204 0132 0206
Office visits	CPT 99201 CPT 99211 CPT 99202 CPT 99212 CPT 99203 CPT 99213 CPT 99204 CPT 99214 CPT 99205 CPT 99215

Criteria for assessing "persistent asthma" (Evidence must include all readily available data regarding whether or not a child used a service. CPT and revenue codes are indicated as appropriate.)	**Codes**
Previous ED Visits	**CPT Codes:** CPT 99281 CPT 99284 CPT 99282 CPT 99285 CPT 99283 **Revenue Codes:** 0450 Emergency Room 0451 Emergency Room: EM/EMTALA 0452 Emergency Room: ER/Beyond EMTALA 0456 Emergency Room: Urgent Care 0459 Emergency Room: Other Emergency Room 450 Emergency Room 451 Emergency Room: EM/EMTALA 452 Emergency Room: ER/Beyond EMTALA 456 Emergency Room: Urgent Care 459 Emergency Room: Other Emergency Room 0981 Professional Fees (096x) Emergency Room 981 Professional Fees emergency room
Diagnoses of asthma	**ICD-9 Codes:** All codes beginning with 493
Filled prescriptions for **Asthma related medications**	*Use NCQA NDC list (ASM-C_DASM-C_final_2012, found by clicking through at (http://www.ncqa.org/HEDISQualityMeasurement/HEDISMeasures/HEDIS2012/HEDIS2012FinalNDCLists.aspx) Eliminate medications in the following 2 categories: leukotriene modifiers, short-acting inhaled beta-2 agonists). May use equivalent updated lists when provided by NCQA.*

EXCLUDE:

Events occurring in patients who do not meet criteria for person-time for the month in which the event occurred.

Events occurring in patients who not have been enrolled in the reporting plan for at least 2 consecutive months before the index reporting month.

Events for which asthma is not listed as the primary or secondary diagnosis. For the purposes of this measure, asthma diagnosis includes all diagnoses with 3 digit ICD-9 of 493. For entities that prefer to use AHRQ's Clinical Classifications Software, the asthma definition (before exclusions) is CCS class 128.

Exclude for concurrent or pre-existing diagnosis of cystic fibrosis (ICD-9 CM codes of 277.0, 277.01. 277.02, 277.03, 277.09), COPD (3 digit ICD-9 code 496) or Emphysema (3 digit ICD-9 code of 492).

5. DATA and SOURCES

General data elements include:

- Age
- Race and ethnicity
- Insurance type (Medicaid, Private, Uninsured)
- Benefit type among insured – (HMO, PPO, FFS, Medicaid Primary Care Case Management Plan (PCCM), Other)
- Zip code or State and County of residence (Please record FIPS where available)

Administrative data with billing and diagnosis codes, utilized to identify:

- Asthma-related visits to an emergency department, outpatient office, or hospitalization
- Asthma medication prescriptions
- Insurance benefit type
- Zip code or State and County of residence (Please record FIPS where available)
- Race and ethnicity (from hospital administrative data or charts if not in administrative data from plan)

6. CALCULATION

Step 1 Measure person-time eligibility for each patient and record by month.

For each month in the reporting year, identify all children ages 2 – 21 years who meet the criteria for persistent asthma as defined above (using indicated exclusions) as of the last day of the month prior to the reporting month.

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

For example, if the goal is to report for January 2011, first one would identify children with persistent 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. This total represents the number of person-months (child-months) for January.

Next, one would identify children with persistent 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. This is the number of person-months (child-months) for February.

Repeat this progression monthly so that for December, one would identify children with persistent 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. This is the number of person-months (child-months) for December.

Record the unique number of children who contribute person-time over the course of the year. This is the Count measure of the number of children with persistent asthma.

Step 2 Month by month, identify the number of ED visits with asthma as a primary or secondary diagnosis among those children who are eligible for that reporting month. Maintain stratification variables and unique identifiers.

Step 3 Report the number of unique children who, in months that they were eligible for the person time measure had an ED visit. (This should be identical to the number of unique children who are identified in Step 2). This is the Count measure of the number of children with ED visits.

Step 4 Sum the number of eligible (Step 2) ED visits with asthma as the primary or secondary diagnosis and associate that number with the appropriate patient identifier.

Step 5 Using the sums obtained in Step 4, report the median (50th percentile), 1st, 10th, 25th, 75th, 90th and 99th percentiles, assuming the sample size is greater than 10 children. Omit the 1st and 99th percentiles for smaller sample sizes (<20). Calculate and report the interquartile range as the difference between the value of the 75th percentile and of the 25th percentile. Report also the 5 highest values for this count measure. This is the first distribution (number of qualifying ED visits per child).

Step 6 Sum the number of months that each child with at least one month of eligibility is eligible and associate that number with the appropriate patient identifier.

Step 7 Using the sums obtained in Step 6, report the median (50th percentile), 1st, 10th, 25th, 75th, 90th and 99th percentile, assuming the sample size is greater than 10 children. Omit the 1st and 99th percentiles for smaller sample sizes (<20). Calculate and report the interquartile range as the difference between the value of the 75th percentile and of the 25th percentile. This is the second distribution (number of months of contribution of person time per eligible child with persistent asthma).

Step 8 Specification of Stratification Variables:

a. 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.

b. 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 .)

c. 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:
    i. Lowest Quartile of Poverty if percent in poverty is <=12.5%
    ii. Second Quartile of Poverty if percent in poverty is >12.5% and <=16.5%
    iii. Third Quartile of poverty if percent in poverty is >16.5% and <=20.7%
    iv. First upper quartile (75th-90th) if percent in poverty is >20.7% and <=25.7%
    v. Second upper quartile (>90th percentile)

d. Categorize age by age at the last day of the prior month. Aggregate into age categories ages 2-4, ages 5 through 11, ages 12-18, ages 19-21.

e. Categorize Race/Ethnicity as Hispanic, non-Hispanic White, Non- Hispanic Black, non-Hispanic Asian/Pacific Islander, and Non-Hispanic Other.

- Insurance as Private (Commercial), Public, None or Other
- Benefit Type as HMO, PPO, FFS, PCCM, Other

Step 9 Repeat Steps 2-6 by strata – age, race/ethnicity, UIC, County Poverty Level, Insurance type, Benefit Type. Report by race/ethnicity within age strata and repeat that analysis by UIC, and also by County Poverty Level. Report by insurance type and benefit type within race/ethnicity.

Figure 1 illustrates the calculation of person-time.

FIGURE 1

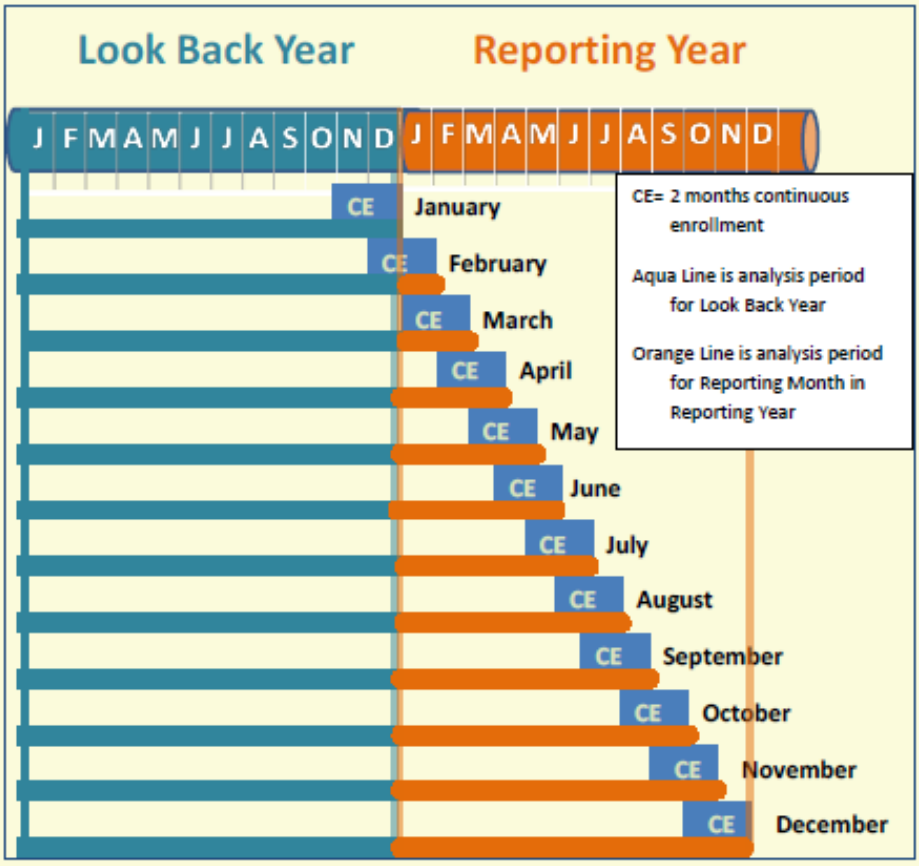


Diagram of Eligibility Requirements for Asthma Measure

Description of Diagram Components

Aqua: Look Back Year
Orange: Reporting Year
Blue: Continuous Enrollment (CE) period must be met to be eligible in a given reporting month
Black: Label of Reporting Month

Description of Eligibility Criteria Assessment

Eligibility Criteria are assessed month by month, using both the entire Look Back Year and the Reporting Year.

For any given reporting month, assess eligibility on 2 criteria. Eligible children are those that meet both of the following:

1) Has the child been continuously enrolled (CE) for the two months prior to the Reporting Month (3 months of continuous enrollment including the current Reporting Month)
2) Does the child meet the criteria for having been managed for persistent asthma in the assessment period (Aqua + Orange Lines)

Section III. Importance of the Measure

In the following sections, provide brief descriptions of how the measure meets one or more of the following criteria for measure importance (general importance, importance to Medicaid and/or CHIP, complements or enhances an existing measure). Include references related to specific points made in your narrative(not a free-form listing of citations).

III.A. Evidence for general importance of the measure

Provide evidence for all applicable aspects of general importance:

- Addresses a known or suspected quality gap and/or disparity in quality (e.g., addresses a socioeconomic disparity, a racial/ethnic disparity, a disparity for Children with Special Health Care Needs (CSHCN), a disparity for limited English proficient (LEP) populations).

- Potential for quality improvement (i.e., there are effective approaches to reducing the quality gap or disparity in quality).

- Prevalence of condition among children under age 21 and/or among pregnant women

- Severity of condition and burden of condition on children, family, and society (unrelated to cost)

- Fiscal burden of measure focus (e.g., clinical condition) on patients, families, public and private payers, or society more generally, currently and over the life span of the child.

- Association of measure topic with children's future health – for example, a measure addressing childhood obesity may have implications for the subsequent development of cardiovascular diseases.
- The extent to which the measure is applicable to changes across developmental stages (e.g., infancy, early childhood, middle childhood, adolescence, young adulthood).

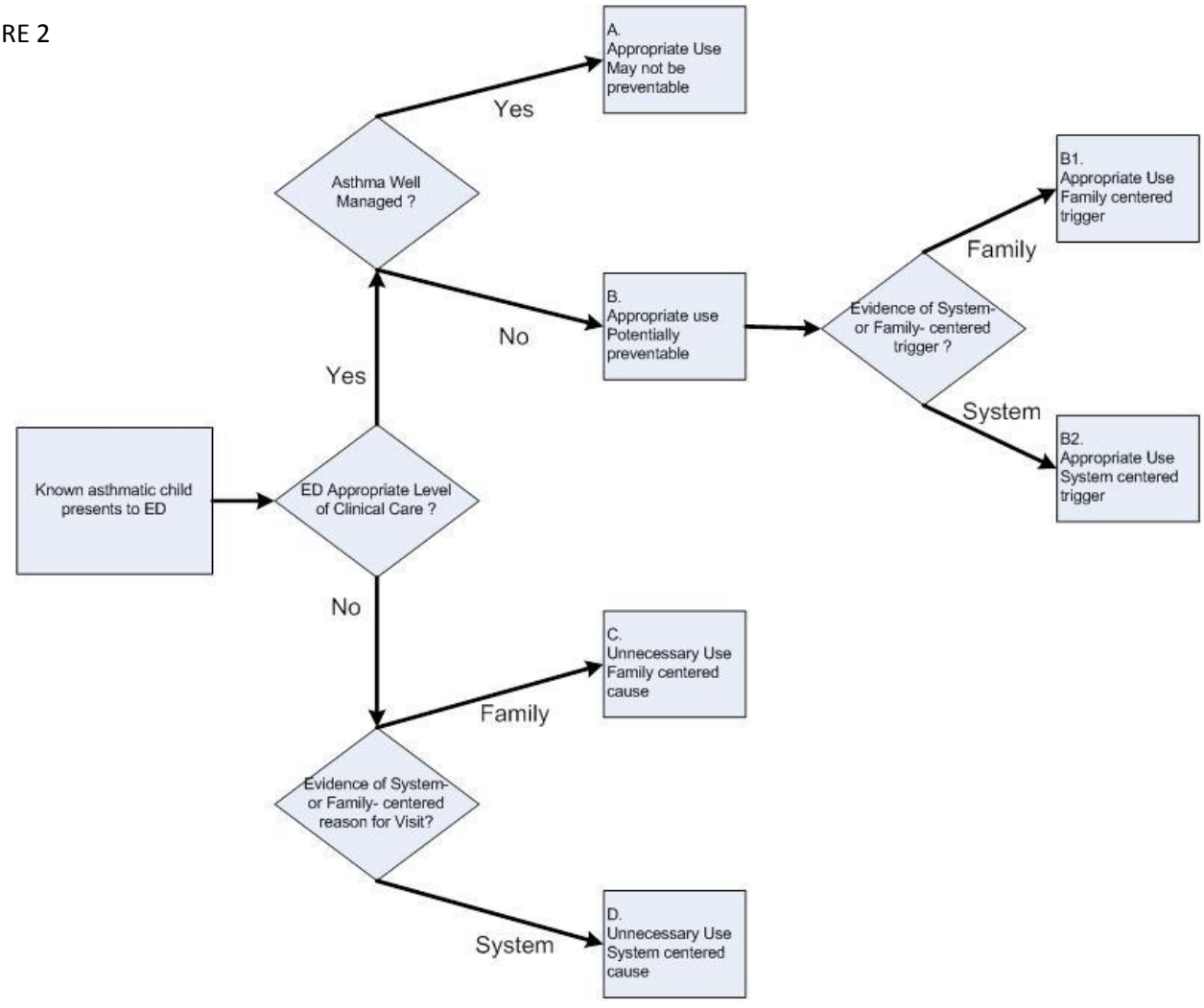
Importance

Asthma matters for pediatrics.[2-13] It is the second most common reason (after allergy) for children to be classified as having a special health care need, accounting for nearly 38.8% of such children. Using national estimates from the federal Healthcare Cost and Utilization Project (HCUP) data, children between 1 and 17 had more than 673,000 of the 1.9 million emergency department visits with asthma as the first diagnosis; almost 11% (or >71,000) of these pediatric visits resulted in hospitalization. Given that a diagnosis of asthma may motivate a visit to the emergency department for infection or other ailments, our work with the New York State Medicaid data suggests that a diagnosis of asthma may underlie a similar number of additional visits as a second diagnosis. Considering all ages, asthma ED visits are common in all regions of the country, with a plurality in the South and fewer in the West. They are relatively evenly split between teaching and non-teaching hospitals and nearly 86% of visits occur for patients who live in metropolitan areas. Drilling down on that last observation, about 56% of visits are in large metropolitan or suburban areas, 29% in smaller metropolitan areas and almost 15% in areas

considered rural. Asthma exacerbations (including ED visits and subsequent hospitalizations) are consequential for the health and well-being of children and their families and may cost as much as $18 billion per year across all ages.[10-13]

Our conceptual model acknowledges that some of these visits are for non-urgent situations, while others require urgent care. We further recognize that some of those who are sick are in the ED for reasons that were preventable and others for reasons that were not. We can thus say that some of the ED use is needed because some children with well managed asthma will break through and have an exacerbation in spite of appropriate management, or because the children are so sick that they require ED care once they begin to head down a path towards respiratory deterioration. There is other use that is appropriate, because the child is sick enough to be in the ED in the moment, but the visit potentially could have been prevented with better prior management. The source for shortcomings in management may lie with the clinicians (e.g. by failure to prescribe inhaled corticosteroids in a child for whom the standard of care would recommend them), the broader system or context (e.g. when caregivers do not have the resources to purchase potentially valuable preventative medications such as ICS) , or the families (e.g. potentially through medication non-adherence, or continued exposure to asthma triggers such as cigarette smoke, over which the family has some control). There also are situations for which the ED per se may not be an appropriate level of care for the clinical circumstance and for which alternate, more appropriate levels of care were or should have been available. An overview of our thinking is illustrated in Figure 2 on the next page.

FIGURE 2



Beyond their effects on costs and on efficient care delivery, preventing ED visits is also important for the well-being of the child and the family, whose routine is disrupted by those visits. The burden of urgent care on the quality of life of the patient and the family is substantial.[10-13] Finally, better controlled asthma is less likely to lead to death or other serious disability. While these instances are thankfully rare, the HCUP data estimate that perhaps 37 children died of asthma in 2010 without making it out of the ED. Studies have demonstrated that clinical and community efforts can reduce the need for ED visits for asthma and asthma exacerbations.[14-22]

These May 2013 CAPQuaM Asthma ED visit measure submissions represent the first stage of our enhancements, enhancing the conceptualization and measurement of the existing counting measure. We anticipate that later submissions will address more nuanced aspects of our conceptual model to the extent that data will allow.

Opportunity for Improvement:

The literature points to two general characteristics of asthma care delivery systems that are correlated with ED utilization. One is the effective use of preventive and routine care measures, such as a multidisciplinary practice or a medical home model, the presence of an asthma action plan, or the judicious use of controller medications in advance of an exacerbation.[15-19] The other is the availability of urgent care visits as a step before ED use in the context of either a general pediatric or an asthma specialty practice.[19] Conversely, a lack of comprehensive asthma care, which includes primary and secondary prevention schemas, and a lack of available urgent care services are both commonly cited reasons for preventable ED visits.[20] It has been demonstrated that children who used the ED underutilized primary care services [19], and it has also been demonstrated that interventions that attempt to provide comprehensive, multidisciplinary care are able to decrease ED utilization for asthma care.[23]

Thus, it is both important and quite possible to reduce ED visits for asthma-related care, which strongly suggests that a quality measure should target this construct. Nevertheless, not every ED visit could or should be prevented. There are legitimate reasons for asthma-related ED care, and a robust quality measure system should try to distinguish, at least to some extent, the difference between potentially preventable versus potentially essential visits. The current measures provide a valid way to assess how frequently asthma visits to the ED occur in children who are being managed for persistent asthma. Future measures will attempt to identify those visits that were clinically appropriate, those for which the ED use probably represents a form of overuse, and those that may have been preventable.

Demographics

The potential for racial and ethnic disparities is high.[22] The survey of Children with Special Health Care Needs (CSHCN), conducted by the CDC and available at www.childhealthdata.org, showed that Black children in particular and also Hispanic children are overrepresented with asthma. 38% of children with asthma have public insurance. One quarter (26%) live in households under the federal poverty line, 28% under twice the federal poverty line, and only 24%

have incomes more than four times the federal poverty line. Nearly three quarters of these children have at least one sibling and almost more than one-third have a sibling who also has a special health care need, using HRSA's screening tool to identify a CSHCN. Manice's careful analysis of the 2005/2006 survey from which these data are taken also found that racial minorities, lower income, and household educational attainment were independent predictors of ED utilization among children with asthma.[10] Our analysis of New York State Medicaid data shows about 2.5 fold increase in the rate of using the ED of non Hispanic Blacks compared to non Hispanic Whites (non Hispanic Black > all Hispanic > Non-Hispanic White > Asian).

III.B. Evidence for Importance of the Measure to Medicaid and/or CHIP

Comment on any specific features of this measure important to Medicaid and/or CHIP that are in addition to the evidence of importance described above, including the following:

- The extent to which the measure is understood to be sensitive to changes in Medicaid or CHIP (e.g., policy changes, quality improvement strategies).
- Relevance to the Early and Periodic Screening, Diagnostic and Treatment benefit in Medicaid (EPSDT).
- Any other specific relevance to Medicaid/CHIP (please specify).

We have done extensive analysis of various approaches to specify this measure using New York State Medicaid data. Depending upon specifics of definitional issues, we have found substantial numbers of children with persistent asthma, with more than 196,000 found to have persistent asthma in 2011 and nearly 60,000 ED visits for asthma coming from the eligible children. This is a substantial issue for New York State Medicaid and beyond. Its importance has been validated by a previous measure having been included as a core Medicaid measure. Our partners in the New York State Medicaid program have been instrumental in the development of this measure set.
As a common illness that frequently results in potentially preventable and costly services such as ED visits, asthma has been a frequent target for measurement since the early days of the modern quality movement. Indeed, some form of counting emergency department visits for children with asthma has been publicly discussed in this context since at least the 1990's. Reducing the relative number of ED visits during the care for asthmatic children remains a high priority on the national agenda both in and out of Medicaid and holds the promise of both financial savings and improved health-related quality of life.

Interest in this topic is sufficiently high that the SNAC that reviewed the initial Medicaid core measures adopted a measure on this topic proposed by the Alabama Medicaid program. That measure has certain definitional concerns, and the Collaboration for Advancing Pediatric Quality Measures (CAPQuaM) was assigned the enhancement of this measure by AHRQ in consultation with CMS. When CAPQuaM made inquiries to CMS via AHRQ regarding the evolution of the measure since its first adoption, we were told that detailed information was no longer available and that the measure lacked current stewardship. We have tried to build on this important foundation

to enhance asthma measurement.

III.C. Relationship to Other Measures (if any)

Describe, if known, how this measure complements or improves on an existing measure in this topic area for the child or adult population, or if it is intended to fill a specific gap in an existing measure category or topic. For example, the proposed measure may enhance an existing measure in the initial core set, it may lower the age range for an existing adult-focused measure, or it may fill a gap in measurement (e.g., for asthma care quality, inpatient care measures).

This measure is an enhancement to an existing measure in the Medicaid Core Measure Set that was developed by the Alabama Medicaid program.

The old measure includes all ED-treated asthmatic events, whether or not the patient was known to be an asthmatic before the event. Further, numerator events alone can qualify children for inclusion in the denominator. Our partners in the New York State Medicaid program have described this characteristic as highly undesirable.

The decision not to require some evidence of asthma in advance of the numerator ED visit has advantages and disadvantages. The biggest advantage is that children for whom receiving any care is challenging are incorporated into the measure, adding a fundamental aspect of access to the measure. We perceive this to be a conflation of two concepts in related but non-identical populations. The two concepts are the management of children with asthma and access to care for children with asthma. The two populations are those children being treated for asthma and those children who have and/or develop asthma. We suggest that this argues for a direct measure of access or availability for children with asthma and plan to address this in future measure submissions.

The major disadvantage of the current Core Measure stems from the fact that this formulation introduces non-differential misclassification error if the “research question” is seeking to compare how well plans manage children with asthma. This type of error reduces the sensitivity of the measure to identify true differences in performance and typically represents a bias towards the null. This is true not only when comparing across plans, but also when comparing performance in subpopulations, including identifying disparities.

Measure 1 in our Measure Set modifies the existing measure by changing the formulation from a modified risk to a true epidemiological rate (incidence density). The denominator moves from children with asthma to years of exposure time contributed by children with asthma, or child- or person-years for short. This falls in the category of a “person-time” denominator. This evolution addresses key shortcomings of the previous measure and offers a highly efficient use of available data (as will be described below). It uses the previous year as a look back year to enhance our sensitivity to identify children appropriate for the denominator, it holds plans responsible only for the management of patients who are known, or should have been known to have asthma, and

limits the amount of noise that may be introduced by diagnostic confusion or uncertainty. These represent meaningful enhancements and have been developed in close collaboration with our expert panel, a varied group of stakeholders, and our partners at New York State Medicaid.
This second measure in the Measure Set uses an alternative framing to produce a more complete understanding of ED use by children with persistent asthma. This second measure reports the number of children who contribute numerator events to the first measure (emergency department visits) and the number who contribute at least one person-month to the denominator of the first measure. It further presents the distribution of the number of ED visits for those with at least one visit and of months contributed to the denominator. Should entities be interested, this measure will allow for calculation of a modified incidence density or risk (the proportion of qualified children who have an ED visit). It further allows for identification of the extent to which the issue of ED use is defined by many children coming to the ED only once during the year contrasted with fewer children having multiple ED visits. Finally, it describes the stability of the population (including the extent to which children with asthma either churn out of insurance eligibility or migrate into eligibility during the course of the year). The two measures combine to help to quantify the frequency and distribution of emergency department use for children with persistent asthma.

Section IV. Measure Categories

CHIPRA legislation requires that measures in the initial and improved core set , taken together, cover all settings, services, and topics of health care relevant to children. Moreover, the legislation requires the core set to address the needs of children across all ages, including services to promote healthy birth. Regardless of the eventual use of the measure, we are interested in knowing all settings, services, measure topics, and populations that this measure addresses. These categories are not exclusive of one another, so please indicate "Yes" to all that apply.

Does the measure address this category?		
a. Care Setting – ambulatory	yes	
b. Care Setting – inpatient	no	
c. Care Setting – other—please specify	yes	Other - Specify Emergency Department
d. Service – preventive health, including services to promote healthy birth	yes	
e. Service – care for acute conditions	yes	
f. Service - care for children with special health care needs/chronic conditions	yes	
g. Service-other (please specify)	no	
h. Measure Topic -duration of enrollment	no	

i. Measure Topic – clinical quality	yes	
j. Measure Topic – patient safety	no	
k. Measure Topic – family experience with care		
l. Measure Topic – care in the most integrated setting		
m. Measure Topic – other (please specify)	no	
n. Population – pregnant women	no	
o. Population – neonates (28 days after birth) (specify age range)	no	
p. Population – infants (29 days to 1 year) (specify age range)	no	
q. Population – pre-school age children (1 year through 5 years) (specify age range)	yes	2-5
r. Population – school-age children (6 years through 10 years) (specify age range)	yes	6-10
s. Population – adolescents (11 years through 20 years) (specify age range)	yes	11 through 20
t. Population – other (specify age range)	no	
	u. Other category (please specify)	

Section V. Evidence or Other Justification for the Focus of the Measure

The evidence base for the focus of the measures will be made explicit and transparent as part of the public release of CHIPRA deliberations; thus, it is critical for submitters to specify the scientific evidence or other basis for the focus of the measure in the following sections.

V.A. Research Evidence

Research evidence should include a brief description of the evidence base for valid relationship(s) among the structure, process, and/or outcome of health care that is the focus of the measure. For example, evidence exists for the relationship between immunizing a child or adolescent (process of care) and improved outcomes for the child and the public. If sufficient evidence existed for the use of immunization registries in practice or at the State level and the provision of immunizations to children and adolescents, such evidence would support the focus of a measure on immunization registries (a structural measure).

Describe the nature of the evidence, including study design, and provide relevant citations for statements made. Evidence may include rigorous systematic reviews of research literature and high-quality research studies.

ED visits for children with asthma is an intermediate outcomes measure of intrinsic value. It represents utilization of expensive services. There is abundant evidence that ED visits are common, may be reduced through improved primary care or community based interventions, and demonstrate disparities.[3-13, 15-22] A more comprehensive literature review is included as an appendix and is incorporated by reference into this section.

This measure and its specifications result from a formal development process that includes stakeholder input including: a parent focus group, The Mount Sinai Pediatrics Department's Parent Advisory Council, interviews with primary care clinicians, the CAPQuaM's multidisciplinary scientific team, a national multidisciplinary expert panel that established key clinical criteria, and a broad group of organizational stakeholders, including the New York State Medicaid Program. Presentation of Measure 1 as an incidence density is appropriate to describe event frequency when not every individual in the denominator contributes and equal amount of time to the denominator, as is the case when asthma may develop or become evident during the course of the reporting year, as with the definition of persistent asthma used by this measure.[24] This formulation also is useful for the specification of the age of the child when it comes to contributing both denominator and numerator time. This second measure independently reports the number of children who experience ED visits for asthma and the number of such visits these children experience. It further allows for characterization of the stability of the eligible population.

V.B. Clinical or other rationale supporting the focus of the measure (optional)

Provide documentation of the clinical or other rationale for the focus of this measure, including citations as appropriate and available.

ED visits for asthma are a common, costly, and potentially preventable health service that may serve as a marker for both insufficiency of primary care and insufficiency of clinical management of asthma by the partnership of the family and the health care team. (See detailed literature review in Appendix.) Also, the current core measure on this topic has calculation/validity concerns in the state Medicaid programs. Hence, CAPQuaM was assigned this measure for the PQMP by AHRQ-CMS.

The validity of our work has benefited from our use of a formal method, a pragmatic adaptation of the CAPQuaM 360 degree method. The method, as adapted to asthma, described in the next paragraph, was specifically designed to develop valid and reliable measures in the face of pragmatic epistemological uncertainty. That is, recognizing that practice extends well beyond the research base, we designed this method to allow us to develop reliable and valid state of the science measures, in part by explicitly modeling and accounting for uncertainties in the measure

development, in part by the conceptualization and implementation of a Boundary Guideline (explained below). We have shared and refined this approach in a number of venues including within the PQMP, comprised of the various PQMP AHRQ-CMS CHIPRA Centers of Excellence, the state PQMP participants, and AHRQ and CMS participants. All presentations have invited dialogue and feedback. This work has been similarly presented at a number of Grand Rounds / weekly conferences in the New York-New Jersey area as well as to national/international audiences, including the Bioethics and children's health services communities. These latter venues include:

· 2012 Pediatric Academic Societies State of the Science Plenary (Boston). This presentation is included as an Appendix.

· 2012 Oxford-Mount Sinai Bioethics Consortium (Amsterdam)

· 2012 Child Health Services Research Interest Group at Academy Health (Orlando) Feedback from these presentations has been extremely positive. The Boundary Guideline construct has generated particular enthusiasm. We asked the Bioethics Consortium to extrapolate the primum non nocere (First, do no harm) principle to apply regarding this aspect of performance measurement. We received strong feedback that not only is it ethical to measure using systematically developed measures (even in the context of some uncertainty), but that it is ethically preferable to use such measures compared with the alternative of providing care that is not assessed (and perhaps not assessable) because of residual uncertainty.

Fortunately, in the case of this proposed measure, we can present both a systematically developed measure and evidence to support its use.

Section VI. Scientific Soundness of the Measure

Explain the methods used to determine the scientific soundness of the measure itself. Include results of all tests of validity and reliability, including description(s) of the study sample(s) and methods used to arrive at the results. Note how characteristics of other data systems, data sources, or eligible populations may affect reliability and validity.

VI.A. Reliability

Reliability of the measure is the extent to which the measure results are reproducible when conditions remain the same. The method for establishing the reliability of a measure will depend on the type of measure, data source, and other factors.

Explain your rationale for selecting the methods you have chosen, show how you used the methods chosen, and provide information on the results (e.g., the Kappa statistic). Provide appropriate citations to justify methods.

The basis for the scientific soundness of this measure lies in the literature discussed above, in clinical expertise, and with administrative and encounter data. Though they have their limitations, these data types have been shown in multiple studies to be a reliable source of information for population level quality measurement. They are currently used for all of the analogous measures of which we are aware, including the current Core Measure.

Quality measures that can be calculated using administrative data have been shown to have higher rates of performance than indicated by a review of the medical record alone: claims data are more accurate for identifying services with a high likelihood of documentation due to reimbursement, such as physician visits, ED visits, hospitalizations, and reimbursed prescription drug use.[25] While data systems and their contents are imperfect [26], it is well recognized that there are tradeoffs that need to be made and that both feasibility and accuracy are important considerations.[27]

Most databases contain consistent elements, are available in a timely manner, provide information about large numbers of individuals, and are relatively inexpensive to obtain and use. Validity of many databases has been established, and their strengths and weaknesses relative to data abstracted from medical records and obtained via survey have been documented.[30] Administrative data are supported, if not encouraged by federal agencies, such as NIH, AHRQ, HCFA, and the VA. The Centers for Medicare & Medicaid Services has made clear to the participating AHRQ-CMS CHIPRA Centers of Excellence funded to develop measures in the Pediatric Quality Measures Program that it places a premium on feasibility when assessing those measures that it will most highly recommend to states to complete. The sources of data for the existing measure and other analogs thereof are based upon administrative data as well, providing consensual validation for the appropriate primary data source.

The use of two years of data to validate the diagnosis of asthma has been found to produce substantial agreement with patient surveys and improves performance over the use of one year of data.[28] Others have reported that using administrative databases to identify asthma is both sensitive and specific compared to review of the primary care physician’s office chart.[29]

The constructs underlying these measures are:

- Identifying children with persistent asthma
- Identifying ED use

We have been guided in our definition of persistent asthma by the results of a formal RAND/UCLA modified Delphi process conducted with a multidisciplinary panel of national experts, which included pediatricians, asthma specialists, a family physician, and ED physicians. The definitions were specified to allow their use with data elements that ought to be available in electronic form to a responsible entity, such as a health plan or state Medicaid program. Potential exceptions to this are elements such as zip code of residence, and race and ethnicity of the child. We understand race and ethnicity are generally available from clinical charts as is zip code, and our work and the field converge on the idea that such structured abstraction of specific data is highly reliable. We have data from a feasibility study conducted at more than a dozen hospitals that demonstrates that these data elements are generally available in the chart, although the definition of race and ethnicity, as well as how it is determined, may vary by institution. Nonetheless, the CHIPRA legislation (2009), which has funded the development of this measure,

Persistent asthma was defined according to the results of an expert panel that was intending to develop a subset of children that would be more inclusive than currently existing approaches, such as the HEDIS Hospitalizations for Children with Persistent Asthma measure. These specifications achieve this goal. More than 1.8 million children were in Medicaid for the full year and prevalence estimates in the Northeast United States are at 11.4%, and 12.5% among families in poverty.[23] Even with slight modifications to make it more inclusive, the stricter HEDIS definition would have identified between 3 and 5 percent of the 600,000 (managed care) – 1.45 million (including FFS) children who met the 12 month continuous enrollment criteria. Our proposed measure identifies ~200,000 children, which is about 87% of the anticipated asthmatics in New York State Medicaid. Hence it achieves its dual goals of selecting from among all children who show signs or symptoms of asthma while still being more inclusive than existing measures.

VI.B. Validity

Validity of the measure is the extent to which the measure meaningfully represents the concept being evaluated. The method for establishing the validity of a measure will depend on the type of measure, data source, and other factors.

Explain your rationale for selecting the methods you have chosen, show how you used the methods chosen, and provide information on the results (e.g., R^2 for concurrent validity).

The reliability section above contains also contains information related to validity.
The use of Expert Panels has been demonstrated to be useful in measure development and health care evaluation, including for children.[31] Practitioners have been identified as a resource for researchers in developing and revising measures, since they are on the frontlines working with the populations who often become research participants. Involving practitioners can assist researchers in the creation of measures that are appropriate and easily administered.[32]
The 360 degree method is highly engaged with collaborators, partners, and the literature. It seeks to target relevant information and perspective and to have measures emerge from the process. The potential measures are then tested to the extent that time and resources permit. In developing the asthma method, we incorporate:

- A high level of engagement with partnered institutions and senior advisors that bring into the process a wide diversity of stakeholders;
- A detailed literature review that is updated and supplemented as needed;
- A focus group with parents, using a guide informed by conversation with an existing Parent Advisory Council at Mount Sinai;
- Interviews with clinicians (both family physicians and pediatricians);
- The CAPQuaM scientific team (including an ED physician; an internist asthma expert; pediatricians, including primary care, pulmonologists, pediatric ED physicians, social workers, and a triple boarded pediatrician-child psychiatrist who

is an international expert in patient adherence; distinguished national and international experts in patient safety; quality measurement and improvement; and a variety of public health professionals);

- A geographically diverse, multidisciplinary expert panel who participated in a 2-Round RAND/UCLA modified Delphi process, with enhanced follow up;
- Development of a Boundary Guideline that takes a multi-vectorial approach to incorporate simultaneously a variety of gradients, including gradients of importance, relevance, and certainty, as appropriate to the construct being represented;
- Specification and review of measures and approaches to measurement by stakeholders and experts;
- Testing and assessment of measure performance to the extent feasible given resources and available time.

This process has led us to enhance the validity of this measure by deflating competing concepts and clearly specifying it as an interpretable epidemiological rate (incidence density). The current Core Measure was a simple risk, with asthma patients defined in the measurement year as having primary or secondary diagnosis for any service, and ED visit defined as a CPT code identified ED visit with asthma as the primary diagnosis. The numerator for the Core Measure includes all patients with at least one ED visit for asthma as asthmatic events, whether or not the patient was known to be an asthmatic before the event. Further, numerator events alone can qualify children for inclusion in the denominator. Our partners in the New York State Medicaid program have described this characteristic as highly undesirable.

Therefore, we proposed as Measure 2 in this set, “Distribution of Emergency Department Visit Use for Children Managed for Persistent Asthma.”

Since we consider persistent asthma, one episode of asthma or asthma-like systems will not necessarily qualify a child as having persistent asthma. The persistent asthma must precede the asthma visit. Since the child had received some treatment for services that suggest persistent asthma, the fact that the child has asthma was available to the health care system. Further, in an attempt to enhance the meaningfulness of the measure, we have included a two month continuous enrollment requirement prior to the reporting month. Since the child must also be eligible for the reporting month, this becomes a three month continuous enrollment requirement. In doing this, we sought to strike a delicate balance between developing a meaningful accountability measure and eliminating children because of problems of churning well documented by researchers.[33] This balance was achieved in close collaboration with our colleagues at NY State Medicaid.

This second measure contributes to the understanding of the population of children using the ED for asthma and provides information that may be useful to support the management of this population by responsible entities such as health plans or large private or public purchasers, for example state Medicaid programs.

We pre-tested our Measure 1 specifications with a series of iterative analyses in New York State Medicaid data. Early on, we found that the combined definitions of persistent asthma and the need for the diagnosis to precede the ED visit meant that the reporting period and the assessment period could not overlap completely. These tests led us to analyze 2 years of data – as shown in the diagram included with our specifications: one year is the reporting year and one the look back year. We further divide the reporting year into 12 reporting months. ED events in that month are eligible for the numerator if persistent asthma criteria have been satisfied (combining the look back year and all prior months in the reporting year) and the child has been continuously enrolled for the two months immediately prior to the reporting month.

We also found many visits in 2011 that were identified by revenue codes and not by CPT codes: using both increased our yield substantially. After consultation with a coding expert, we became convinced that these were likely to be real ED visits. Accordingly, we have incorporated revenue codes into our specifications.

Our data from New York State Medicaid represent 61,327 asthma ED visits for 40,855 children among 200,769 children who contributed to the 185,606 person-years denominator. The number of children who contribute to the denominator represents those children who have persistent asthma and were seen in a New York State Medicaid health plan for at least 3 consecutive months ending in a month during 2011.
For Measure 1, we learned that we found that the rate varied as expected by age and by season of the year. Chart 1 in the uploaded file includes data for Reporting year 2011.

We find these data and their consistency with expected findings to be persuasive that the measure is both valid and sensitive to real differences.

Specifically regarding this measure, 40,855 children experienced 61,327 eligible emergency department visits. The median number of visits was 1.5. Percentiles are shown in the table below. 10% of children had 3 or more eligible visits and five had 16 or more visits.
The number of eligible months for the typical child (the median) was 12 months, and 75% were elgible for all 12 months. 10% were eligible for 8 months or fewer. Full reporting of the measure is shown in the attached Table 2.

CHART 1

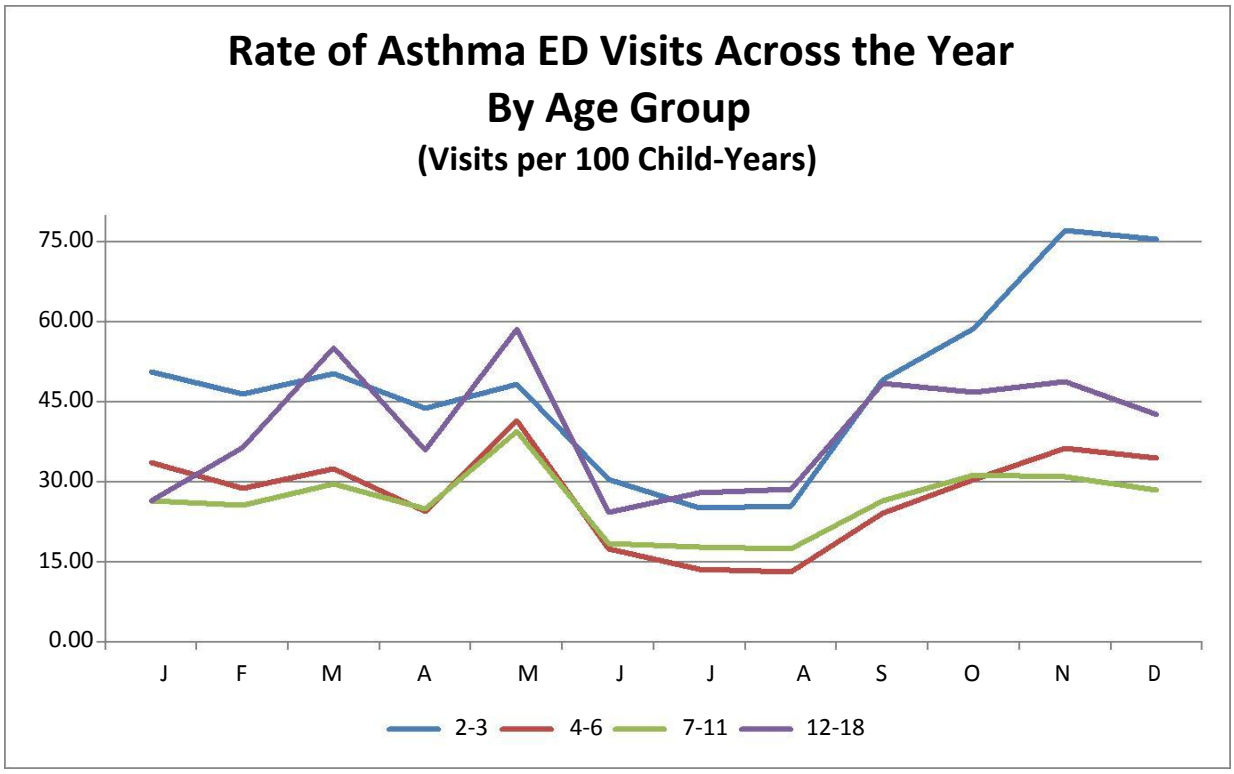

Rate of Asthma ED Visits Across the Year
By Age Group
(Visits per 100 Child-Years)
75.00
60.00
45.00
30.00
15.00
0.00
J
F
M
A
M
J
J
A
S
O
N
D
2-3
4-6
7-11
12-18

TABLE 2

Asthma Measure 2 Summary New York State Medicaid, 2011		
Moment or Characteristic:	**Count of ED Visits**	**Number of Person-Months**
Number of Children	40,855	200,769
Sum Total	61,327 Visits	2,227,267 Person- Months (185,606 Person-Years)
Median	1.50	12
Percentiles:		
1	1	2
10	1	8
25	1	12
75	2	12
90	3	12
99	6	12
Interquartile Range	1 ED Visit	0 Months
Top Five Values	16,16,17, 24, 25 Visits	N/A

Section VII. Identification of Disparities

CHIPRA requires that quality measures be able to identify disparities by race, ethnicity, socioeconomic status, and special health care needs. Thus, westrongly encourage nominators to have tested measures in diverse populations. Such testing provides evidence for assessing measure's performance for disparities identification. In the sections below, describe the results of efforts to demonstrate the capacity of this measure to produce results that can be stratified by the characteristics noted and retain the scientific soundness (reliability and validity) within and across the relevant subgroups.

VII.A. Race/Ethnicity

These measures are specified to be assessed by race/ethnicity. Our testing in New York State confirmed the practicality of so doing. By providing actual counts of the numbers of children it provides an estimate of the burden of the disease in defined racial and ethnic populations. Shorter durations of time in the person-time distribution would provide indication that either persistent asthma is increasing meaningful during the year in that population, or that there was significant churning in and out of that plan for that population. Either finding would be important and demand attention.

Using New York State Medicaid data for Reporting Year 2011 and Look Back Year 2010, we found that the measure is practical, and that it varies as expected by race/ethnicity and urbanicity. For example, the overall rate for NH Blacks is 44.6 visits per 100 child years, compared to 35.2 for Hispanics, and 17.8 for NH Whites. Those in the most urban UIC (1) had a rate of 35.2 visits per 100 child years, compared to about 20 in more suburban and rural metro areas, compared to 11.1 in rural UICs (7-9), which are the most rural in NY State.

VII.B. Special health care needs

The Maternal and Child Health Bureau has defined children with special health care needs (CSHN) as children “[w]ho have or are at increased risk for a chronic physical, developmental, behavioral, or emotional condition and who also require health and related services of a type or amount beyond that required by children generally.”[34] Considering this definition, children with persistent asthma are children with special health care needs.

VII.C. Socioeconomic status

Our analyses were conducted in Medicaid data. The measure is specified to be stratified in 2 ways to assess aspects related to socioeconomic status: Public versus Commercial Insurance, and by 5 strata defined by the percent of the population in poverty in the county of residence. During our feasibility assessment phase, we asked institutions whether the payment source was available in the medical record (EMR or paper) and the difficulty of abstracting this information from those records. We found that payment source is generally available in the medical chart and is overall not difficult to abstract. As we expect this measure primarily to be generated by insuring entities these data are expected to be present and available in the administrative data. Zip codes of residence are typically available in both medical records and administrative data sets and can be linked to county of residence as described in the specifications. We have identified five distinct strata based on the proportion of persons living beneath the poverty line. Such ecological data have been found to be independent predictors of health outcomes and are readily available using

USDA data.[35] The five strata represent the 3 quartiles of lowest poverty each as one stratum, and the highest quartile divided into 2 strata, the 75th-90th percentiles and the highest 10%. In New York State, only quartiles 1 through 3 are present, so we were not able to demonstrate the sensitivity of the measure specifically, but we were able to demonstrate the practicality of the method.

VII.D. Rurality/Urbanicity

These measures are specified to be reported by Urban Influence Codes (UIC), which have been developed by the USDA based on a number of criteria to describe the levels of urbanicity and rurality. This is intended not only to report within plan differences but to allow for aggregation as appropriate. While each UIC has its own meaningful definition, some researchers choose to aggregate various codes. We recommend consideration of the aggregation schema of Bennett and colleagues at the South Carolina Rural Research Center.[36] 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. 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 observe that UIC 5 might as well be aggregated with 4, 6, &7 as an adjacent rural area. Further, this approach to rurality does not map exactly to the population density based definition of frontier (< 6 persons per square mile) as articulated in the Affordable Care Act, use of such categories is consistent with the ACA's intent that the Secretary ask that data that are collected for racial and ethnic disparities also look at underserved frontier counties.

Frontier health care may be approximated by analysis of the remote rural categories.[28] This judgment was confirmed after CAPQuaM consulted with Gary Hart, Director of the Center for Rural Health at the University of North Dakota. School of Medicine & Health Sciences, who is heading a HRSA-funded project to develop new methods to analyze frontier health. We clarified that his work 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 sensitivity.
Those interested in care specific to large cities may wish to aggregate the rural area and analyze UIC 1 and 2 separately. Frontier health care may be approximated by analysis of the remote rural categories.[37] The New York State Medicaid data were sensitive to urbanicity with higher rates of ED utilization in the most urban areas and lowest in the most rural areas and other areas intermediate between the two.

VII.E. Limited English Proficiency (LEP) Populations

We have not tested or specified this measure for this specific purpose

Section VIII. Feasibility

Feasibility is the extent to which the data required for the measure are readily available, retrievable without undue burden, and can be implemented for performance measurement. Using the following sections, explain the methods used to determine the feasibility of implementing the measure.

VIII.A. Data Availability

1. What is the availability of data in existing data systems? How readily are the data available?

The definitions were specified to allow their use with data elements that ought to be available in electronic form as administrative data to a responsible entity, such as a health plan or state Medicaid program. While zip code is sometimes a hidden or non-public variable when such data sets are released, it generally is available to a responsible entity, such as an insurer and a Medicaid program. While race and ethnicity are typically available to Medicaid programs and are on institutional medical records (e.g. hospitals), they may or may not be on an individual physician practice's chart. They are often but not always recorded in insurance databases. We have data from a feasibility study conducted at more than a dozen hospitals that confirms that both data elements are generally available in the hospital chart, frequently electronically. The CHIPRA legislation that funded this work indicates that measures are to be able to assess racial and ethnic disparities and hence these data points need to be specified in this measure.

2. If data are not available in existing data systems or would be better collected from future data systems, what is the potential for modifying current data systems or creating new data systems to enhance the feasibility of the measure and facilitate implementation?

Routine incorporation of patient reported race and ethnicity (or parent reported for children) into managed care and other insurance administrative databases.

VIII.B. Lessons from Use of the Measure

1. Describe the extent to which the measure has been used or is in use, including the types of settings in which it has been used, and purposes for which it has been used.

The currently specified measure is not currently in use.

2. If the measure has been used or is in use, what methods, if any, have already been used to collect data for this measure?

N/A

3. What lessons are available from the current or prior use of the measure?

The core asthma measure has been in use for some time, although many states choose not to report. According to CMS Annual Reports on the Quality of Care for Children in Medicaid in 2011 and 2012, only 5 states reported the measure in federal fiscal year (FFY) 2010, and this increased to 14 states in FFY 2011.[38] One issue cited in the 2011 report was that there were concerns about data availability.[39] At the time, the Core measure required the use of pharmaceutical data to establish eligibility. While conversations with the New York Medicaid program leave us to believe that pharmacy data are now generally available, we have added a note to our specifications that if such data are not available the measure may be reported if that absence of data is noted. During our pretesting in New York State, we found that absence of pharmacy data reduced the number of eligible children modestly and led to about a 1 percentage point difference in the proportion of children who had ED visits for asthma.
The current measure requires careful but mundane SAS programming. We can make an exemplar program available upon request. We again are informed by our colleagues at New York State Medicaid that it would be unusual for a state Medicaid program or submitting entity to not have available skilled analytical programming resources, whether internally or on contract, to assist with reporting requirements.

Section IX. Levels of Aggregation

CHIPRA states that data used in quality measures must be collected and reported in a standard format that permits comparison (at minimum) at State, health plan, and provider levels. Use the following table to provide information about this measure's use for reporting at the levels of aggregation in the table.

For the purpose of this section, please refer to the definitions for provider, practice site, medical group, and network in the Glossary of Terms.

If there is no information about whether the measure could be meaningfully reported at a specific level of aggregation, please write "Not available" in the text field before progressing to the next section.

Level of aggregation (Unit) for reporting on the quality of care for children covered by Medicaid/ CHIP†:

State level*: Can compare States

Intended use: Is measure intended to support meaningful comparisons at this level? (Yes/No)	yes
Data Sources: Are data sources available to support reporting at this level?	yes
Sample Size: What is the typical sample size available for each unit at this level? What proportion of units at this level of aggregation can achieve an acceptable minimum sample size?	New York State had ~200,000 children with about 2.2 million person-months in the denominator. Eliminate any strata with less than 40 person-months in any month's denominator OR less than 1000 person-months for the year.
In Use: Have measure results been reported at this level previously?	no
Reliability & Validity: Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?	no
Unintended consequences: What are the potential unintended consequences of reporting at this level of aggregation?	None anticipated

Other geographic level: Can compare other geographic regions (e.g., MSA, HRR)

Intended use: Is measure intended to support meaningful comparisons at this level? (Yes/No)	yes
Data Sources: Are data sources available to support reporting at this level?	yes

Sample Size: What is the typical sample size available for each unit at this level? What proportion of units at this level of aggregation can achieve an acceptable minimum sample size?	New York State Medicaid had ~200,000 children with about 2.2 million person-months in the denominator. Slightly more than 100,000 person-months were in urban areas and the rest in rural ones. The measure uses urban influence codes.Eliminate any strata with less than 40 person-months in any month's denominator OR less than 1000 person-months for the year.
In Use: Have measure results been reported at this level previously?	no
Reliability & Validity: Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?	no
Unintended consequences: What are the potential unintended consequences of reporting at this level of aggregation?	None anticipated

Medicaid or CHIP Payment model: Can compare payment models (e.g., managed care, primary care case management, FFS, and other models)

Intended use: Is measure intended to support meaningful comparisons at this level? (Yes/No)	yes
Data Sources: Are data sources available to support reporting at this level?	yes
Sample Size: What is the typical sample size available for each unit at this level? What proportion of units at this level of aggregation can achieve an acceptable minimum sample size?	New York State had ~200,000 children with about 2.2 million person-months in the denominator. For our analysis we did not look at payment models but eligibility categories. In NY Medicaid 184,000 person-months were for SSI, 1,358,482 in TANF, and 626,280 in UNAS. Measure is specified to be reported by benefit design.Eliminate any strata with less than 40 person-months in any month's denominator OR less than 1000 person-months for the year.
In Use: Have measure results been reported at this level previously?	no

Reliability & Validity: Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?	no
Unintended consequences: What are the potential unintended consequences of reporting at this level of aggregation?	None anticipated

Health plan*: Can compare quality of care among health plans.

Intended use: Is measure intended to support meaningful comparisons at this level? (Yes/No)	yes
Data Sources: Are data sources available to support reporting at this level?	yes
Sample Size: What is the typical sample size available for each unit at this level? What proportion of units at this level of aggregation can achieve an acceptable minimum sample size?	New York State had ~200,000 children with about 2.2 million person-months in the denominator. Eliminate any strata with less than 40 person-months in any month's denominator OR less than 1000 person-months for the year.
In Use: Have measure results been reported at this level previously?	no
Reliability & Validity: Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?	no
Unintended consequences: What are the potential unintended consequences of reporting at this level of aggregation?	None anticipated

PROVIDER LEVEL

Individual practitioner: Can compare individual health care professionals

Intended use: Is measure intended to support meaningful comparisons at this level? (Yes/No)	no
Data Sources: Are data sources available to support reporting at this level?	no

Sample Size: What is the typical sample size available for each unit at this level? What proportion of units at this level of aggregation can achieve an acceptable minimum sample size?	Not specified for this purpose. Use not recommended
In Use: Have measure results been reported at this level previously?	no
Reliability & Validity: Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?	no
Unintended consequences: What are the potential unintended consequences of reporting at this level of aggregation?	Not specified for this purpose. Use not recommended

PROVIDER LEVEL

Hospital: Can compare hospitals

Intended use: Is measure intended to support meaningful comparisons at this level? (Yes/No)	no
Data Sources: Are data sources available to support reporting at this level?	no
Sample Size: What is the typical sample size available for each unit at this level? What proportion of units at this level of aggregation can achieve an acceptable minimum sample size?	Not specified for this purpose. Use not recommended
In Use: Have measure results been reported at this level previously?	no
Reliability & Validity: Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?	no
Unintended consequences: What are the potential unintended consequences of reporting at this level of aggregation?	Not specified for this purpose. Use not recommended

PROVIDER LEVEL

Practice, group, or facility: Can compare: (i) practice sites; (ii) medical or other professional groups; or (iii) integrated or other delivery networks**

Intended use: Is measure intended to support meaningful comparisons at this level? (Yes/No)	no
Data Sources: Are data sources available to support reporting at this level?	no
Sample Size: What is the typical sample size available for each unit at this level? What proportion of units at this level of aggregation can achieve an acceptable minimum sample size?	Not specified for this purpose. Use not recommended
In Use: Have measure results been reported at this level previously?	no
Reliability & Validity: Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?	no
Unintended consequences: What are the potential unintended consequences of reporting at this level of aggregation?	Not specified for this purpose. Use not recommended. We can imagine there are circumstances where large IDS with risk may find this measure useful, but it was not designed with that in mind or tested for that purpose.

Section X. Understandability

CHIPRA states that the core set should allow purchasers, families, and health care providers to understand the quality of care for children. Please describe the usefulness of this measure toward achieving this goal. Describe efforts to assess the understandability of this measure (e.g., focus group testingwith stakeholders).

We have had conversations about this measure and its understandability with our expert panel, our partners at the NY State Department of Health, including leadership of the Medicaid program, and other stakeholders. Our collective conclusion is that the redefinition of the measure to only include those children who were known to be asthmatic prior to the index ED visit, and the lessening of the extent to which the ED visit can contribute to eligibility each make the measure significantly more intuitive to understand and serve to make it a far better accountability measure. Further, the testing in New York State confirmed that the measure both reduced from approximately 1.4 million children with an asthma diagnosis and some continuous enrollment to 200,000 the number of children eligible for the measure. Our definition of persistent asthma was not only intended to be a filter, but to be inclusive.

We found 196,623 children with persistent asthma. This compares to the 45,155 identified by the much more stringent HEDIS criteria for hospitalizations for children with asthma. We conclude that we have identified a meaningful and inclusive group of children known to have asthma who are at risk for ED visits, contributing to the measure's understandability.

This measure provides a count of the number of children who have persistent asthma, the distribution of eligible ED visits that they had, a count of the number of children who qualified as having persistent asthma managed in the plan, and a description of the distribution of how many months those children were eligible to have their ED visits counted. These are straightforward constructs – the counts are understandable, and the distributions should be readily understood by those interested in them. They provide insight into the extent to which a few children with problematic asthma contribute to the rate and also to the dynamics and stability of the population.

One of our expert panel member commented to us about both asthma-related measures, noting more specifically about this one ("the second measure"):
"These appear to be much better measures than simply counts. The second measure is one of those things you think about and then say---of course that is what we should have been doing all along. Nice work. "

We have not specifically tested the understandability of this measure with patients.

Section XI. Health Information Technology

Please respond to the following questions in terms of any health information technology (health IT) that has been or could be incorporated into the measure calculation.

XI.A. Health IT Enhancement

Please describe how health IT may enhance the use of this measure.
Integrated administrative data sets that include clinical services, pharmacy, and patient demographics, including patient (parent) reported race/ethnicity, and state and county of residence will enhance use of this measure.

XI.B. Health IT Testing

Has the measure been tested as part of an electronic health record (EHR) or other health IT system?
no

If so, in what health IT system was it tested and what were the results of testing?
NOT APPLICABLE

XI.C. Health IT Workflow

Please describe how the information needed to calculate the measure may be captured as part of routine clinical or administrative workflow.
NOT APPLICABLE

XI.D. Health IT Standards

Are the data elements in this measure supported explicitly by the Office of the National Coordinator for Health IT Standards and Certification criteria (see http://healthit.hhs.gov/portal/server.pt/community/healthit_hhs_gov__standards_ifr/1195)? no

If yes, please describe.
NOT APPLICABLE

XI.E. Health IT Calculation

Please assess the likelihood that missing or ambiguous information will lead to calculation errors. NOT APPLICABLE

XI.F. Health IT Other Functions

If the measure is implemented in an EHR or other health IT system, how might implementation of other health IT functions (e.g., computerized decision support systems in an EHR) enhance performance characteristics on the measure?
NOT APPLICABLE

Section XII. Limitations of the Measure

Describe any limitations of the measure related to the attributes included in this CPCF (i.e., availability of measure specifications, importance of the measure, evidence for the focus of the measure, scientific soundness of the measure, identification of disparities, feasibility, levels of aggregation, understandability, health information technology).

We acknowledge that some states may be unable to include prescription fills in their data. Our formative analysis suggests that less than 5% of included children are included specifically because of medication refills. Thus, the measure can be assessed with only limited error in such circumstances.

The use of county rather than individual data on poverty is both a strength (in that it can be reliably assessed and has substantive meaning as a contextual variable) and a limitation, in that it is an ecological variable.

The eligibility of these criteria that restrict it to children identified as those being managed for persistent asthma is both a strength and a limitation. It avoids conflation with the construct of basic access to care and makes the measure more specific to the management of asthma. The specifications were intended to be and are less restrictive than the persistent asthma specifications written for the HEDIS Asthma hospitalization measure.

Several departures from traditional approaches will require users to develop familiarity with this measure. It provides the information to calculate a risk, but is not specified as a risk. It complements the interpretation of the rate measure as specified in Measure 1 in this set. The inclusion of ED visits with asthma as a secondary diagnosis probably more accurately conveys the influence of asthma on ED utilization, but is a departure from the prior methods. In the New York State Medicaid data, we found that when asthma was the secondary diagnosis, it was very rare for children to be in ED with asthma as a second diagnosis and to have a CPT code of 99281, which is the code for a simple problem with simple decision making. We infer from this that the higher codes suggest that the asthma came into play for the visit and that our panel was wise to ask us to include these as events.

Section XIII. Summary Statement

Provide a summary rationale for why the measure should be selected for use, taking into account a balance among desirable attributes and limitations ofthe measure. Highlight specific advantages that this measure has over alternative measures on the same topic that were considered by the measure developer or specific advantages that this measure has over existing measures. If there is any information about this measure that is important for the review process but has not been addressed above, include it here.

This measure indicates the number of children being managed for persistent asthma, the number of those children who have eligible ED visits, and the distribution of both the number of ED visits among those who have visits and of months being managed for persistent asthma among all eligible children.

It complements another measure that describes the incidence rate of emergency department visits for children ages 2 – 21 who are being managed for persistent asthma. It belongs to the PQMP Measures of Emergency Department Use for Children with Asthma Process 1 Collection, and the PQMP Measures of Emergency Department Use for Children with Asthma Frequency Set.

This measure and its specifications result from a formal development process that includes stakeholder input throughout. ED visits for asthma are common, costly, and potentially preventable. They may serve as a marker for both insufficiency of primary care and insufficiency of clinical management of asthma by the partnership of the family and the health care team.
This measure is intended for reporting by purchasers, health plans, regions, or states using administrative data, supplemented if needed for demographic data by medical records.
The literature demonstrates that both clinical, system, and community interventions may improve care for asthma and reduce ED visits. The potential for racial and ethnic disparities are high. We found large racial and ethnic differenced in ED use for asthma in NY State Medicaid. Poverty may also be associated with increased ED use for children with asthma. More than 200,000 children had persistent asthma (using our definition) in NY State Medicaid in 2011 (almost 11%) and over 60,000 ED visits for asthma came from the eligible children.

We pre-tested our specifications with a series of iterative analyses in NY State Medicaid. We found 61,327 asthma ED visits for 40,855 children among 200,769 children who contributed to the 185,606 child-years denominator. We found that the rate varied as expected by age and by season of the year .and by race/ethnicity, and urbanicity. For example, the overall rate for NH Blacks is 44.6, compared to 35.2 visits per 100 child years for Hispanics, and 17.8 for NH Whites. Those in the most urban UIC (1) had a rate of 35.2 visits per 100 child years compared to about 20 in more suburban and rural metro areas compared to 11.1 in rural UICs (7-9), which are the most rural in NY State.

We find these data and their consistency with expected findings to be persuasive that our measurement approach is both valid and sensitive to real differences. The current measure offers insight into the burden of illness experienced by children and in subpopulations as well as the stability of children with persistent asthma remaining in the plan.

The measure is based on administrative data and therefore is feasible with generally available data. It can readily be aggregated from the level of a single insurance plan or purchaser.

We have had conversations about this measure and its understandability with our expert panel, our partners at the NY State Department of Health, including leadership of the Medicaid program, and other stakeholders. Our collective conclusion is that the redefinition of the measure to only include those children who were known to be asthmatic prior to the index ED visit, and the lessening of the extent to which the ED visit can contribute to eligibility each make the measure significantly more intuitive

The feedback from our collaborators is that this measure set advances the understanding of asthma outcomes and is intuitive and nuanced both.

Section XIV: Identifying Information for the Measure Submitter

Complete information about the person submitting the material, including the following:

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The CHIPRA Pediatric Quality Measures Program (PQMP) Candidate Measure Submission Form (CPCF)
was approved by the Office of Management and Budget (OMB) in accordance with the Paperwork Reduction Act.
The OMB Control Number is 0935-0205 and the Expiration Date is December 31, 2015.

PUBLIC DISCLOSURE REQUIREMENTS

Each submission must include a written statement agreeing that, should U.S. Department of Health and Human Services accept the measure for the 2014 and/or 2015 Improved Core Measure Sets, full measure specifications for the accepted measure will be subject to public disclosure (e.g., on the Agency for Healthcare Research and Quality [AHRQ] and/or Centers for Medicare & Medicaid Services [CMS] websites), except that potential measure users will not be permitted to use the measure for commercial use. In addition, AHRQ expects that measures and full measure specifications will be made reasonably available to all interested parties. "Full measure specifications" is defined as all information that any potential measure implementer will need to use and analyze the measure, including use and analysis within an electronic health record or other health information technology. As used herein, "commercial use" refers to any sale, license or distribution of a measure for commercial gain, or incorporation of a measure into any product or service that is sold, licensed or distributed for commercial gain, even if there is no actual charge for inclusion of the measure. This statement must be signed by an individual authorized to act for any holder of copyright on each submitted measure or instrument. The authority of the signatory to provide such authorization should be described in the letter.

The signed written statement was submitted