Uninsured Children: How We Count Matters

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ABSTRACT. Background. Because children uninsured for less than a full year are often reported as insured, they receive less attention in health policy debates than do the full-year uninsured and are underrecognized as potential users of public insurance programs. Objective. The purpose of this study is to assess the impact on estimates of how many US children are uninsured when alternatives to the full-year uninsured definition are used.

Methods. Monthly health insurance coverage data collected from children through age 18 in the 1999 Medical Expenditure Panel Survey were analyzed to estimate prevalence of health insurance gaps among children in terms of the size of part-year and full-year uninsured child population, duration of uninsured gaps, and aggregate uninsured spells.

Results. Although 6.6 million (8.4%) children in the United States were uninsured throughout 1999, an additional 11.4M (14.4%) were uninsured for part of the year. Part-year uninsured gaps accounted for 41.7% of a total of 130M months of missing coverage experienced by all children.

Conclusions. Different definitions and measures of who are uninsured can project radically different pictures of the magnitude of the problem. As this study shows, including the part-year uninsured more than doubled the estimated uninsured child population for 1999, and increased the estimated aggregate uninsured months by 71%. As potential users of public coverage, children who have no insurance for part of the year should be included when evaluating challenges to and accomplishments by the State Children’s Health Insurance Program and other public programs. Their significant numbers and the potential burden they place on the health care delivery system argue for them to be counted and for the causes and consequences of short-term uninsured spells to be better understood. Pediatrics 2003;112:e168–e173. URL: http://www.pediatrics.org/cgi/content/full/112/2/e168; health insurance coverage gaps, part-year uninsured children, short-term uninsured spells, State Children’s Health Insurance Program evaluation.

How the Uninsured Are Counted

How many children are uninsured in the United States? This is a deceptively simple question. There are several alternate ways to define and measure who are uninsured. How one measures substantially affect the estimated size of the uninsured. These estimates, in turn, play a critical role in designing, funding, and evaluating public programs to insure low-income children. One such example is the federal and state partnership to insure low-income children through Title XXI/State Children’s Health Insurance Program (SCHIP). In this program, initial federal funds were allocated to the states according to the number of uninsured low-income children reported by the Census Bureau based on the Current Population Survey (CPS). Since then, considerable resources and attention have been given to the CPS for this purpose. Recognizing the need for state-level data for SCHIP program evaluation as required by Title XXI legislation, Congress appropriated $10M annually beginning in Fiscal Year 2000 to increase the sample size of the CPS so that reliable estimates of low-income uninsured children can be obtained for each state. The significance of estimates of uninsured children as a measure of Title XXI success was reiterated in a report to Congressional Committees submitted by the General Accounting Office, advising states to use the CPS and other national surveys to evaluate how much SCHIP has reduced the number of low-income uninsured children. To report on the progress of SCHIP in a news conference in August 2002, the Robert Wood Johnson Foundation released a CPS-based report of state-level estimates of overall uninsured children, and those who are eligible for SCHIP or Medicaid but remained uninsured.

How the Uninsured Are Counted

A careful reading of widely publicized reports of uninsured children, however, would reveal that a number of children lacking health insurance for less than a full year are often not counted among the uninsured. This happens because most reports of the uninsured child population are based on the CPS, which is designed to identify only individuals who lacked health insurance throughout the year. In the CPS, respondents are prompted for any coverage of any duration during the survey year, and a single episode of coverage, regardless of its duration, would categorize that individual as being insured. Examples of CPS questions on health insurance coverage are given in Appendix A. Because the CPS allows only those lacking health insurance throughout the year to be identified as uninsured (the full-
year uninsured), it counts as insured those who actually had uninsured spells during the 12-month survey period (the part-year uninsured). Nonetheless, the CPS is the most widely used data source because it provides a sample size which permits state-specific estimates (with combined years of data until the sample size was increased in 2002) and a timeliness in reporting annual data that is not matched by other national surveys. Because of its popularity, the CPS is regarded as the benchmark of health insurance coverage, against which other surveys compare their estimates.6

In the past, because of underreported Medicaid coverage and other methodological issues, unadjusted CPS estimates were believed to have been exaggerated and resemble a point-in-time estimate of the uninsured (ie, number uninsured on an average day), rather than the full-year uninsured estimate that the survey was designed to measure.8 Paradoxically, this imprecision also increased the policy value of the CPS because estimates of persons uninsured throughout an entire year would have been too restrictive to use as a principal measure of uninsured throughout a survey period (the part-year uninsured). Nonethe-

Consistent with the intent of the survey, these diligent efforts improved the precision with which the CPS measures the full-year uninsured.14 But in doing so, they also diminished the survey’s utility as a point-in-time representation of the uninsured population. As a result, most experts regard CPS-based estimates as in between a full year and a point-in-time measure of the uninsured. Nonetheless, in the absence of an alternative data source that would provide timely, state-level estimates to inform policy debates, the CPS continues to be the benchmark against which other surveys compare their estimates and remains the most popular source of data on children’s health insurance coverage.

Less restrictive measures of the uninsured that include individuals without insurance for less than a full year can be estimated from other data sources, but they are not as widely known or accepted as the CPS in the public health policy forum. Several federally funded national surveys, including the Survey of Income and Program Participation (SIPP), the National Health Interview Survey, and the Medical Expenditure Panel Survey (MEPS), do collect data in ways that allow for estimating, at the national level only, the part-year uninsured (for less than a year) and those uninsured at a point in time, in addition to the full-year uninsured. Studies based on 1992 and 1993 SIPP data, for instance, estimated the full-year uninsured US population at above 7%, and the total full-year and part-year uninsured between 20% and 21%, respectively.8

Why It Matters How We Count

Defining who are uninsured is more than a semantic or methodological issue. Depending on the size of the uninsured population excluded by the definition, the resulting bias could significantly distort the design of public health insurance programs, short-change program funding, and influence their chances of success. Policy based only on measures of who are uninsured all year will obscure the existence of many children without insurance and underestimate the need for coverage and potential demand for the program. In turn, the impact of public programs, such as SCHIP and Medicaid, cannot be fully assessed without measuring how they affect part-year uninsured children who qualify for these programs. For instance, does SCHIP reduce the frequency or the length of uninsured spells? Because parents of SCHIP-income eligible children are less likely to have stable jobs that provide affordable family health insurance benefits,15 their children may experience interspersed uninsured spells more frequently than children in other income ranges. Arguably, counting the part-year uninsured is especially critical for SCHIP planning and evaluation. Although most SCHIP programs implement crowd-out provisions in the form of waiting periods subsequent to termination of employer-based coverage and before a child qualifies, only a handful of states require that period to exceed 6 months.16 This implies that a number of children uninsured for less than a full year are in fact eligible to enroll in SCHIP.

The purpose of this study is to assess the impact on estimates of how many US children are uninsured when alternatives to the full-year uninsured definition are used: when part-year coverage gaps are included, what is the effect on the total estimated number of US children without health insurance, as compared with a point-in-time estimate? How long are typical part-year coverage gaps? How might they impact demand for public programs?

METHODS

Estimates in this study are based on monthly health insurance coverage data reported in the 1999 Full Year Population Characteristics File (HC-031) of the MEPS.17 The full 1999 MEPS household sample consists of 9345 reporting units which include 23,565 responding individuals that completed the full series of MEPS interviews (3 rounds) for calendar year 1999. Each reporting unit in MEPS is defined as person(s) in the sampled household who are related by blood, marriage, adoption, foster care, or other family association. HC-031 contains data on demographic characteristics of individuals and families, health insurance coverage, and source of payment for each month of 1999, as well as other health and medical care-related information. Family income data has not been released to date.18 HC-031 is the most current MEPS data on full-year monthly health insurance coverage available in a public-use datafile released by the Agency for Healthcare Research and Quality.

All children through age 18 as of July 1, 1999, were included in this study. The person level weight variable (PERWT99P) provided with HC-031 was used to produce a nationally representative sample of the civilian noninstitutionalized child population of the United States. Health insurance gap is defined by a summary variable for each month (INSJA99X-INSDE99X) that indicates coverage under CHAMPUS/CHAMPVA/TRICARE, Medicare, Medicaid, or other public or private hospital/physician insurance. A child is considered uninsured for a month if the summary variable...
does not indicate coverage for that month. Examples of MEPS questions on health insurance coverage are given in Appendix A.

The full-year uninsured was computed as the weighted sum total of children uninsured all 12 months of 1999. The part-year uninsured was estimated as the weighted sum total of children uninsured for 1 to 11 months of the same year. The point-in-time estimate was calculated by averaging the number of uninsured children across all 12 months in 1999. Duration of insurance gap is defined as the number of months in which a child was uninsured. Aggregate insurance gaps or total months of uninsured spells, represent the sum total of uninsured months experienced by children who were full-year and part-year uninsured.

Data analysis was conducted using the Taylor series provided by the SUDAAN software, which takes into account the complex sample design of MEPS. Reliability of estimates is measured by their standard errors and reported as relative standard errors, which represent the ratio of the standard error to the estimate itself. Relative standard errors of 30% or lower are recommended according to National Center for Health Statistics (NCHS) guidelines.

### RESULTS

A total of 18 million (M) infants and children through age 18 (22.8% of the population) were uninsured for all or part of 1999 according to MEPS (Table 1; Fig 1). Although an estimated 6.6M (8.4%) lacked health insurance coverage throughout 1999, an additional 11.4M (14.4%) were uninsured between 1 and 11 months of the year. In an average month, 11.1M (14.1%) children were uninsured. Among those uninsured for less than a full year, 39.1% were uninsured for 6 months or longer. The proportions of children uninsured full-year and part-year (for 1–2 months, 3–6 months, and 7–11 months, respectively) are shown in Fig 1. The average insurance gap experienced by the part-year uninsured was 4.8 months. Part-year uninsured children outnumbered full-year uninsured children 5 to 3 (see Table 1).

Aggregate insurance gaps expressed in terms of total months of uninsured spells, was estimated at 130.4M months for full-year and part-year uninsured children. Fifty-eight percent (76.1M months) were attributed to full-year uninsured children, while 42% (54.3M months) were attributed to part-year uninsured children (see Table 2).

### DISCUSSION

How we define and measure who are uninsured makes a substantial difference. Using MEPS data we found that counting the part-year uninsured in addition to the full-year uninsured more than doubled the estimated number of children without insurance, from 6.6M (8.4%) to 18.0M (22.8%), and increased the estimated aggregate uninsured months by 71%, from 76.1 to 130.4M months in 1999.

This analysis is based on a single data source for 1 year. However, other data sources support the veracity of the magnitude of difference we found between counting the uninsured as full-year or part-year uninsured. Insurance coverage reports most commonly rely on the CPS, which uses a full-year definition of uninsured. The estimated number of children uninsured all year based on MEPS (8.4%) is similar to, though lower than the estimate derived from the CPS, which most experts believe to represent a measure more inclusive than a full-year estimate. The Urban Institute and Kaiser Commission on Medicaid and the Uninsured estimated the proportion of uninsured children to be 12% based on pooled CPS data for 1999 and 2000.

There are a few other sources to compare our findings regarding the part-year uninsured. The challenges in measuring insurance coverage and the differences between measures of full- and part-year uninsured are well-known to the methodologists who design and use national data sets. However, studies describing the differences between these measures are not generally reported in the indexed, medical literature and remain unknown in the broader pediatric community. Estimates based on the SIPP indicated that in 1993, 6.5% of US children under age 18 were uninsured throughout the year, but a substantially larger proportion (15.5%) were uninsured at some point the same year. Similarly, unpublished estimates from the National Health Interview Survey, obtained directly from the NCHS by the Office of the Assistant Secretary for Planning and Evaluation, indicate that although 27.8M US residents (of all ages) were uninsured throughout 1997, an additional 25.1M lacked coverage at some point during the year.

How many children are uninsured? What appears to be a straightforward question has not one, but many alternative answers, each reflecting different ways that children and their families might experience lack of insurance. Measuring who are uninsured is surprisingly difficult. Alternative strategies and survey methods can yield very different answers, and the debate will continue about what is the right way to measure who are uninsured. An exact estimate of how many are uninsured is likely to remain elusive. For the ongoing debate, the current study testifies not to what is the correct answer, but demonstrates that if only those without insurance all year are counted, many children who go without insurance will be hidden.

### Implications

Which measure is chosen to count how many children are uninsured might have significant policy implications. Estimating insurance coverage as it evolves into the early 21st century will require flexibility and new measures of insurance coverage. The pediatric community needs to embrace the methodologic and data challenges necessary to provide more accurate estimates of insurance coverage. Additionally, the use of the CPS and MEPS for insurance estimates will require a more consistent and clear definition of what is uninsured.

### Table 1

<table>
<thead>
<tr>
<th>Uninsured Status</th>
<th>Number Uninsured</th>
<th>RSE (%)</th>
<th>Column RSE (%)</th>
<th>% of Population</th>
<th>RSE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uninsured full-year</td>
<td>6.6 M</td>
<td>6.4</td>
<td>36.8</td>
<td>4.8</td>
<td>8.4</td>
</tr>
<tr>
<td>Uninsured part-year (average gap = 4.8 mo)</td>
<td>11.4 M</td>
<td>5.6</td>
<td>63.2</td>
<td>2.8</td>
<td>14.4</td>
</tr>
<tr>
<td>Uninsured in an average month during the year</td>
<td>11.1 M</td>
<td>5.8</td>
<td>61.6</td>
<td>2.9</td>
<td>14.1</td>
</tr>
<tr>
<td>Total uninsured at any point during the year</td>
<td>18.0 M</td>
<td>4.7</td>
<td>100</td>
<td>0</td>
<td>22.8</td>
</tr>
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RSE indicates relative standard error.
implications. Children without insurance for part of the year outnumbered those uninsured all year 5 to 3, and they accounted for 40% of the aggregate months children did not have insurance. Thus, counting only the full-year uninsured masks the number of families losing or going without insurance for their children and substantially underestimates the potential demand for and cost of public programs to insure children. The high number of children who are uninsured part-year also signals significant rates of insurance turnover (exits and entries by different people) and churning (exits and entries by the same people).

Turnover and churning disrupt continuity of care, create burdens for families, clinicians, and administrators and produce inefficiency in the health care system overall. Although we know little about the impact of short-term insurance gaps on children’s health, we do know that children who are uninsured are at risk of losing timely access to medical care, developing adverse outcomes and accruing avoidable hospital expenses. High churning and turnover rates increase administrative costs for private health plans and public programs. Churning is known to render Medicaid managed care plans unattractive to commercial insurers. Providers are also likely to bear significant burden of patients’ intermittent coverage, in the form of uncompensated care following coverage termination and denied charges for treating preexisting conditions after coverage resumes. These problems encumber the health care delivery system and raise health care costs for all.

**TABLE 2.** Estimated Aggregate Coverage Gaps (Months) by Alternative Measures of Uninsured Status for Children Through Age 18, 1999 MEPS

<table>
<thead>
<tr>
<th>Aggregate Coverage Gaps (Total Months of Uninsured Spells)</th>
<th>RSE (%)</th>
<th>Column (%)</th>
<th>RSE (%)</th>
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</thead>
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<tr>
<td>Uninsured full-year</td>
<td>76.1M</td>
<td>6.5</td>
<td>58.3</td>
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<tr>
<td>Uninsured part-year (average gap = 4.8 mo)</td>
<td>54.3M</td>
<td>6.2</td>
<td>41.7</td>
</tr>
<tr>
<td>Total uninsured at any point during the year</td>
<td>130.4M</td>
<td>5.0</td>
<td>100</td>
</tr>
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RSE indicates relative standard error.

**Recommendations**

Because different definitions and measures of who are uninsured can project radically different pictures of the magnitude of the problem, reports of insurance coverage should clearly explain how the uninsured are defined, alert audiences to any limitations inherent in the adopted measures, and discuss how those limitations may impact the representation of the uninsured.

Given the complexity of insurance coverage, multidimensional and multiple definitions of the uninsured should be incorporated in national and state surveys, so that they can be reported and admitted in policy debates. For example, a multidimensional indicator of insurance coverage can be created based on new data soon to be available through the National Survey of Children With Special Health Care Needs. This survey not only collected data on current coverage, but also collected data on the number of months of coverage (or lack of coverage) during the 12 months preceding the survey interview. Alternatively, a recent Institute of Medicine report examines the proportion of the population with 1 or more family members experiencing health insurance gaps thus speaks to the population who share the burden of financial and health consequences of being uninsured.

Because a number of uninsured individuals regain private health insurance without government intervention, short-term uninsured spells have, to an extent, been construed as a problem that “corrects itself” and, consequently, viewed as a minor issue relative to chronic uninsurance. That view, how-
ever, needs to be reassessed. The pervasiveness of short-term uninsured spells and their potential for creating inefficiency in the health care delivery system argue for more research on the dynamics and consequences of insurance turnover and churning. The true cost to care for the short-term uninsured, regardless of who bears that cost, needs to be documented and understood. We also need to study the impact of insurance gaps on access to care and health outcomes. As we better understand the dynamics of gaining and losing insurance coverage, solutions to problems created by short-term uninsured spells can be contemplated.

Study Limitations
Although the observation of uninsured spells is limited to a 12-month window in this study, it would be useful to assess the dynamics of coverage gaps over a longer period of time using alternative data sources such as the SIPP, which tracks health insurance coverage over a span of 30 to 48 months. This study did not attempt to correct for biases that often characterize survey-based estimates of the uninsured child population. In particular, in the CPS, MEPS, and other surveys there is a concern that responders underreport participation in Medicaid because of the stigma attached to participating in a welfare program. Administrative data compiled by the Center for Medicare and Medicaid Services, for example, indicated that there were 21.6M children who participated in Medicaid in Federal Fiscal Year 1999, 2.1M more than reported in the 1999 MEPS. Had public coverage been accurately and fully recorded in the MEPS, both full-year and part-year uninsured rates are expected to be adjusted downward from estimates reported in this analysis. This study did not attempt to estimate the current uninsured child population; data reported in the current study reflects the state of children’s health insurance coverage in 1999. Since then, unemployment has grown and employee cost sharing of employer-based health plans has climbed. But SCHIP enrollment also increased to counter potential loss of employer-based coverage among children to a degree. How much these factors have affected current estimates of uninsured children is not yet known. What appears certain is that the number of children who will go without health insurance at some point this year is far greater than the uninsured numbers typically reported.

Appendix A. Examples of Health Insurance Coverage Questions Used in CPS and MEPS

CPS

Example of survey questions on health insurance coverage:
At any time in (Calendar Year Before Survey Interview), (were you/ was anyone else in this household) covered by (Insurance Source—or, a health plan provided through your current or former employer or union/State Medicaid Program Name, etc)?

Coverage Verification Question—asked of household member(s) for whom no single type of insurance was reported:
I have recorded that (PERSON) was not covered by a health plan at any time in (Calendar Year Before Survey Interview). Is that correct?
If answer is “No” What type of Insurance was (PERSON) covered by in (Calendar Year Before Survey Interview)?

MEPS

Surveyees are instructed to gather health insurance identification cards and other relevant documents to provide identifying information concerning their health insurance coverage during survey interviews.

Example of survey questions on health insurance coverage:
Has anyone in the family been covered by (Insurance Source—e.g., Medicare/State Medicaid Program Name) at any time since (Survey Round START DATE)?

For (Insurance Source): Was (PERSON) covered the whole time from (Survey Round START DATE) until today, or only part of the time?
If answer is “Part of the Time”

For each of the following months (Month of START DATE through Month before Interview Month), was (PERSON) covered the whole month, part of the month, or not at all during the month?

Has person been covered continuously, from the first of this month through today?

Appendix B. Effects of Coverage Verification Question and Simulation of Underreported Coverage on CPS-Based Estimates of Uninsured Children

A coverage verification question added to the CPS since 1999 recovered ~8% of individuals who had failed to mention coverage for the survey period, thereby reducing the uninsured estimate by 8%–13. A more substantial downward revision of the uninsured estimate would result from efforts to recover unreported Medicaid coverage, such as the Urban Institute’s TRIM2 or TRIM3 Models. For example, although raw CPS data indicated total Medicaid-insured children through age 18 at 15.2M for 1999, CMS reported Medicaid enrollment at 21.5M for Federal Fiscal Year 1999 (October 1, 1998 through September 30, 1999). To bring state Medicaid enrollment in the CPS data to match the levels reported by CMS, the TRIM2 or TRIM3 Models would probabilistically assign Medicaid coverage to children whom the model determines to be Medicaid eligible until Medicaid coverage in the CPS matches the CMS report at the state level.

Although it is not known exactly how much such a correction would reduce CPS-based estimates of uninsured children for 1999, previous simulations based on these models suggest that the reduction in the uninsured estimate would be nontrivial. In a previous application of the TRIM2 model to 1995 CPS data, for example, the estimated uninsured child population through age 18 was reduced by 28%, from 10.5M (14.0%) before the simulation to 7.6M (10.3%) after.

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REFERENCES

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