Linking Administrative and Survey Data for Health Policy Research in the US: The case of the 'Medicaid Undercount'

Exploiting Existing Data for Health Research
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US Health Insurance and the Medicaid Undercount

- The US does not have universal coverage
  - Most recent estimate from 2006 is that 47 million people in the US lacked insurance coverage (out of 297 million) -- 15.8 percent
- Medicaid and the State Children’s Health Insurance Program (SCHIP) are two means tested publicly financed health insurance programs aimed at insuring low income Americans
  - Tend to have more liberal eligibility criteria for children
- Survey estimates of health insurance coverage and enrollment in Medicaid and SCHIP are important to health policy research in the US
- Survey estimates of Medicaid enrollment are well below administrative data enrollment figures

Extent of the Medicaid undercount?

- In the present study we compare the Medicaid Statistical Information System (MSIS) to the Current Population Survey (CPS).
- Raw Undercount numbers:
  - Calendar Year 2001 MSIS has 48.6 million records and CPS counts 27.8 million Medicaid enrollees (43% undercount)
The Current Population Survey Estimate of the Number Enrolled in Medicaid Divided by the Adjusted MSIS Number of Medicaid Enrollees Ages 0-64

2000

Why do we care?

- CPS estimates of health insurance are important to US health policy research
  - Used for policy simulations by federal and state governments
  - Surveys like the CPS are the only sources for population estimates on the uninsured
  - Surveys are also the only source of the Medicaid/SCHIP eligible, but uninsured population
  - CPS is used in the SCHIP funding formula
  - CPS is often used to evaluate federal programs and state initiatives
- The magnitude of the undercount calls the validity of CPS survey insurance estimates into question
What could explain the undercount?

- Explanations I have some data on today:
  - Universe differences between MSIS and CPS survey data
    - Paying special attention to sample loss (those cases with missing IDs that cannot be linked)
    - The data are linked through use of the Social Security Number (SSN).
      - This is replaced by a protected identification key or (PIK)
  - Survey Measurement error

Building a common ‘linked universe’
The Basic Table

### Table 1: Counts from the MSIS, CPS and Linked Data Files: 2000, 2001

[Numbers in Thousands]

<table>
<thead>
<tr>
<th></th>
<th>Calendar Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2001</td>
</tr>
<tr>
<td>MSIS Data Counts</td>
<td></td>
</tr>
<tr>
<td>A.1. All People In MSIS</td>
<td>48,556</td>
</tr>
<tr>
<td>A.2. Minus All SCHIP Only Enrollees</td>
<td>46,717</td>
</tr>
<tr>
<td>A.3. Minus Non-Full Medicaid Benefit Enrollees</td>
<td>42,184</td>
</tr>
<tr>
<td>A.5. Minus Duplicate Enrollees</td>
<td>40,461</td>
</tr>
<tr>
<td>A.6. Minus Those Without PIKs (SSNs)</td>
<td>38,213</td>
</tr>
<tr>
<td>CPS Counts</td>
<td></td>
</tr>
<tr>
<td>B.1. All People in the CPS</td>
<td>279,588</td>
</tr>
<tr>
<td>B.2. Recorded as Having Medicaid in CPS</td>
<td>27,749</td>
</tr>
<tr>
<td>Linked Data File Counts</td>
<td></td>
</tr>
<tr>
<td>C.1. Raw Number of Linked Cases</td>
<td>24</td>
</tr>
<tr>
<td>C.2. Weighted Number of Linked Cases*</td>
<td>35,988</td>
</tr>
</tbody>
</table>

*Weighted using the adjusted CPS person weight

Source: 2000 and 2001 MSIS Calendar Year files

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Fitting the MSIS and CPS records into the “linkable universe”

- Line A.6. shows how many cases from MSIS had Medicaid and were linkable to the survey data
  - 38.2 and 36.2 million in 2001 and 2000
  - Linking IDs were not missing at random
- In the CPS 24% or records are not linkable as they are missing linking IDs (i.e., SSN or PIKs).
  - Most of these refused to provide the linking data in the survey
  - We assumed IDs were missing at random and to fix this problem we simply re-weighted the remaining 76% of cases to equal the full 100% of cases using common post-stratification adjustment cells
- The re-weighted number of CPS survey cases in row C.2 was slightly below the row A.6 totals
  - 6% under in 2001 and 8% in 2000
Universe Issues Explain Part of the Undercount but not all

- The original crude undercount was 43% in 2001
- After universe adjustments it is down to 31% (comparing line A.5 to B.2)

The linked Survey and Medicaid data for Survey Response Error

- Focusing on only those with reported health insurance data
  - 58.9% Respond Medicaid
  - 14.6% Respond some other type of public
  - 9.5% Respond some type of private coverage
  - 16.9% Respond they were uninsured
  - 99.9%
- 41% of the linked respondents report something other than Medicaid
  - This is major cause of the remaining undercount
What factors are associated with measurement accuracy/error?

- Length of time enrolled in Medicaid
- Recency of enrollment in Medicaid
- Poverty status impacts Medicaid reporting but does not impact the percent reporting they are uninsured
- Adults 18-44 are less likely to report Medicaid enrollment
- Adults 18-44 more likely to report being uninsured

Work remaining to be done

- Linkable universe differences:
  - We know our initial group quarter adjustment is too small
    - We should be removing more MSIS cases from the count
    - Use 7 state Medicaid files to further analyze the CPS sample frame coverage

- Measurement error:
  - Compare measurement error in the CPS survey to other federal government surveys by linking the MSIS to them
Work to be done, continued

- Survey sample coverage error and survey nonresponse bias
  - Assess whether those addresses with a Medicaid enrollee are more likely to not participate in CPS survey
- Model the impact of sample loss due to non-validated CPS and MSIS records on our estimates
- Getting a handle on ‘false-positive’ Medicaid survey responses

Conclusions

- These are preliminary results that are subject to change after further investigation
- Survey measurement error is playing the most significant role in producing the undercount
  - Some Medicaid enrollees answer that they have other types of coverage and some answer that they are uninsured
- ‘Linkable universe’ issues play a major role as well
- The overall goal of the project is to improve the CPS for supporting health policy analysis
  - At the moment the CPS has serious validity issues for its major policy uses in evaluation, simulations and allocations
  - Our goal is to work with census to improve the CPS
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