



The Medicaid Undercount and the Policy Relevance of Measurement Error in the Current Population Survey (CPS)

Michael Davern, Ph.D.

Assistant Professor, Research Director
SHADAC, Health Policy & Management
University of Minnesota

Washington Statistical Society

November 13th, 2008

Funded by a grant from the Robert Wood Johnson Foundation

“SNACC” project team

- Office of the Assistant Secretary for Planning and Evaluation:
 - George Greenberg, Don Cox, and Rob Stewart (now at CBO)
- U.S. Census Bureau Collaborators:
 - Sally Obenski, Ron Prevost, Dean Resnick, Marc Roemer, Amy O’Hara, Victoria Lynch, Chuck Nelson and Dawn Haines
- Abt Associates
 - Jacob Klerman
- Centers for Medicare and Medicaid Services
 - Dave Baugh, Gary Ciborowski
- State Health Access Data Assistance Center
 - Michael Davern, Kathleen Thiede Call, Gestur Davidson, Lynn Blewett
- Special thanks to Shelly Martinez from OMB for inviting me and organizing

Why do we care?

- Survey estimates of Medicaid enrollment are well below administrative data enrollment figures
- CPS estimates are important for health policy research
 - Used for policy simulations by federal and state governments
 - Surveys such as 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

Goals of this presentation

- Perform a basic accounting of the raw undercount
 - Raw CPS count is 57% of the raw MSIS count
- Within linked data examine the reporting errors that directly impact policy uses of the data
 - How many CPS people linked to MSIS do not report Medicaid coverage?
 - How many CPS people linked to MSIS report being uninsured?
 - How many people only report Medicaid in the CPS but are not linked to MSIS?
- Discuss policy research implications

Data

- Census linked 2001 and 2002 CPS records with MSIS data for CY 2000-2002
 - There are important limitations of the linking
 - 9% of all full benefit Medicaid cases in MSIS are missing linking keys
 - Our analysis limited to full-benefit Medicaid enrollees with linking identifiers
 - In 2001 26% of CPS cases are missing linking keys (largely due to refusal to provide data)
 - Remaining CPS cases are reweighted to equal the whole population

Analysis sample

Table 1: Counts from the MSIS, CPS and Linked Data Files: CY 2001 [Numbers in Millions]

Selected Universe Counts	2001
A.1. All People In MSIS	48.55
A.2. Minus All SCHIP Only Enrollees	46.7
A.3. Minus Non-Full Medicaid Benefit Enrollees	42.2
A.4. Minus Those in Inst. Group Quarters	42.05
A.5. Minus Duplicate Enrollees	40.45
A.6. Minus Those Without PIKs (SSNs)	38.2
CPS Survey Counts	
B.1. All People in the CPS	279.6
B.2. Sub-set Reported as Having Medicaid	27.7
Linked Data File Counts	
C.1. Raw Number of Linked Cases	0.026
C.2. Weighted Number of Linked Cases*	36
C.3. Sub-set of Linked Cases Reported as Medicaid*	20.55

Source: 2000 and 2001 MSIS Calendar Year files

* Weighted using the adjusted CPS person weight

Working out universe issues

- Imperfect concept alignment reduces the raw Medicaid undercount considerably
 - Adjusted MSIS total is 40.45 and CPS is 27.7, which is 68.5% of the MSIS total (improved from 57%)
- The “linkable universe” of cases is somewhat off
 - 38.2 million for MSIS were linkable and a weighted 36 million for CPS were linked
 - In a separate analysis we estimate roughly half of the difference is due to Inst. group quarters folks in MSIS
 - Used extra data supplied by six states and Census 2000 data
- Next we examine reporting errors in linked cases

Selected covariates of reporting error

- Selected covariates of measurement error
 - Healthcare utilization under Medicaid
 - Length of enrollment
 - Recency of enrollment
 - Relationship to household reference person
 - Age
 - Imputation/editing
 - Poverty status
 - Sex
 - Race and ethnicity
 - State

What linked cases reported

Table 2: Current Population Survey (CPS) Responses to the Health Insurance Coverage Items by People Linked to MSIS by Selected Characteristics: Survey Reference Year of 2001 (2002 CPS Survey Year)

Selected Characteristics	Persons Coded Medicaid Only	Persons Coded Medicaid and Something Else	Persons Coded With Some Other Type of Health Insurance Coverage	Persons Coded As Being Uninsured	Total (in thousands)
Age					
Age 0 - 5	50.6%	10.9%	24.5%	13.7%	7,740
Age 6 - 14	47.8%	10.8%	25.1%	16.3%	9,080
Age 15 - 17	44.1%	9.8%	25.5%	19.6%	2,040
Age 18 - 44	38.1%	11.7%	24.1%	26.1%	10,800
Age 45 - 64	40.9%	25.0%	21.6%	12.5%	3,520
Age 65 and over	0.7%	58.6%	39.3%	1.4%	2,800
Race/Ethnicity					
White	40.3%	17.1%	25.7%	17.1%	23,450
Black	42.8%	14.1%	25.1%	17.8%	10,100
Native American	46.3%	11.1%	22.2%	20.4%	1,080
Asian Pacific Islander	35.7%	17.1%	30.0%	17.1%	1,400
Sex					
Male	43.0%	15.1%	25.7%	16.4%	14,550
Female	39.6%	16.8%	25.5%	18.1%	21,400
Hispanic Ethnicity					
Hispanic	44.7%	11.6%	21.2%	22.5%	7,740
Non-Hispanic	40.0%	17.3%	26.8%	15.9%	28,250

What linked cases reported (cont)

Selected Characteristics	Persons Coded Medicaid Only	Persons Coded Medicaid and Something Else	Persons Coded With Some Other Type of Health Insurance Coverage	Persons Coded As Being Uninsured	Total (in thousands)
Poverty Level					
Poverty Level 0 - 49%	57.9%	7.9%	11.8%	22.1%	6,600
Poverty Level 50 - 74%	55.2%	14.9%	14.0%	15.8%	4,420
Poverty Level 75 - 99%	44.0%	23.7%	19.5%	13.3%	4,820
Poverty Level 100 - 124%	43.0%	20.3%	21.7%	15.5%	4,140
Poverty Level 125 - 149%	38.0%	15.2%	30.4%	17.7%	3,160
Poverty Level 150 - 174%	34.0%	16.3%	32.6%	16.3%	2,820
Poverty Level 175 - 199%	31.1%	15.5%	35.9%	18.4%	2,060
Poverty Level 200% Plus	22.5%	17.5%	42.0%	18.0%	8,000
Enrolled in Survey Year and Length of Time Enrolled in Reference Year					
Eligible for < 61 Days of Year	25.6%	11.6%	32.6%	27.9%	860
Eligible for 61 to 180 Days of Year	31.7%	12.4%	31.7%	24.1%	2,900
Eligible for > 180 Days of Year	47.0%	18.4%	21.1%	13.4%	26,150
Imputed or Edited or Reported					
Edited	51.3%	48.7%	0.0%	0.0%	1,560
Imputed	19.5%	15.0%	40.4%	24.7%	5,340
Reported	44.3%	14.6%	24.1%	16.9%	29,100
Overall	41.0%	16.1%	25.6%	17.4%	36000
Total Unweighted Count	10400	3800	6200	3500	23900

What non-linked cases reported

Table 3: Current Population Survey (CPS) Responses to the Health Insurance Coverage Items by NOT Linked to MSIS by Selected Characteristics: Survey Reference Year of 2001 (2002 CPS Survey Year)

Selected Characteristics	Persons Coded Medicaid Only	Persons Coded Medicaid and Something Else	Persons Coded With Some Other Type of Health Insurance Coverage	Persons Coded As Being Uninsured	Total (in thousands)
Age					
Age 0 - 5	3.5%	1.8%	86.5%	8.5%	15,800
Age 6 - 14	2.2%	1.9%	85.3%	10.5%	28,850
Age 15 - 17	1.4%	1.6%	85.1%	11.9%	8,720
Age 18 - 44	1.0%	0.7%	77.6%	20.6%	98,750
Age 45 - 64	0.8%	1.0%	84.6%	13.6%	60,950
Age 65 and over	0.1%	3.9%	95.2%	0.7%	29,850
Race/Ethnicity					
White	1.0%	1.3%	85.0%	12.8%	203,400
Black	2.9%	2.7%	73.1%	21.2%	26,650
Native American	2.4%	1.6%	64.6%	30.7%	2,540
Asian Pacific Islander	1.4%	1.1%	78.7%	18.6%	11,050
Sex					
Male	1.2%	1.3%	82.1%	15.5%	121,850
Female	1.2%	1.5%	84.3%	12.9%	121,750
Hispanic Ethnicity					
Hispanic	3.0%	1.5%	61.7%	33.9%	24,400
Non-Hispanic	1.0%	1.4%	85.6%	12.0%	219,200

What non-linked cases reported (cont)

Selected Characteristics	Persons Coded Medicaid Only	Persons Coded Medicaid and Something Else	Persons Coded With Some Other Type of Health Insurance Coverage	Persons Coded As Being Uninsured	Total (in thousands)
Poverty Level					
Poverty Level 0 - 49%	7.0%	2.1%	44.3%	46.6%	6,820
Poverty Level 50 - 74%	8.4%	3.4%	45.3%	42.9%	4,060
Poverty Level 75 - 99%	4.9%	3.3%	52.3%	39.5%	6,120
Poverty Level 100 - 124%	4.3%	2.8%	59.8%	33.2%	7,820
Poverty Level 125 - 149%	3.0%	2.8%	68.1%	25.8%	9,840
Poverty Level 150 - 174%	1.9%	2.3%	72.0%	23.7%	10,300
Poverty Level 175 - 199%	1.8%	1.7%	74.7%	21.5%	10,900
Poverty Level 200% Plus	0.4%	1.1%	89.3%	9.2%	187,800
Imputed or Edited or Reported					
Edited	42.4%	55.9%	0.0%	0.0%	1,180
Imputed	2.9%	5.1%	71.0%	21.2%	31,550
Reported	0.7%	0.6%	85.5%	13.2%	210,850
Overall	1.2%	1.4%	83.2%	14.2%	243,600
Total Unweighted Count	1850	1950	126500	16800	147000

Selected multivariate results

Table 3: Odds Ratios for Failing to Report Being on Medicaid in the 2000 or 2001 CPS and Odd Ratios for Failing to Report Being Insured in the CPS for Those CPS Cass that were Linked to the MSIS and Were Receiving Full Benefit Medicaid at Some Point During the Last Year

Variables	Report No Medicaid	Report Uninsured
Enrolled in Survey Month	0.68 *	0.74 *
Zero Family Income Reported	3.06 *	3.23 *
Age		
0 - 5	0.74 *	0.59 *
6 - 14	0.86	0.75 *
15 - 17	0.90	1.04
18 - 44	1.20 *	2.50 *
45 - 64	0.88	1.94 *
65 +	1.64 *	0.45 *
Race/Ethnicity		
Hispanic	1.14	1.29 *
Black	1.08	0.86
American Indian	0.88	0.90
Asian or Pacific Islander	1.21 *	1.48 *
White	0.76 *	0.68 *

Additional covariates

Table 3: Odds Ratios for Failing to Report Being on Medicaid in the 2000 or 2001 CPS and Odd Ratios for Failing to Report Being Insured in the CPS for Those CPS Cass that were Linked to the MSIS and Were Receiving Full Benefit Medicaid at Some Point During the Last Year

Variables	Report No Medicaid	Report Uninsured
Type of Medicaid		
Not on MAX File	0.95	1.83 *
Not on Managed Care, No Med Services Received	1.66 *	1.08
On Managed Care, Med Services Not Noted	1.19 *	0.88
Not on Managed Care, Med Services Received	0.76 *	0.81 *
On Managed Care, Med Services Noted	0.70 *	0.72 *
Poverty		
0-49%	0.49 *	0.98
50-75%	0.64 *	0.98
75-99%	0.83 *	1.16 *
100-124%	0.92	1.03
125-149%	1.19 *	1.03
150-174%	1.22 *	0.83 *
175-199%	1.49 *	1.06
>200%	1.98 *	0.98

State odds ratios

Table 3: Odds Ratios for Failing to Report Being on Medicaid in the 2000 or 2001 CPS and Odd Ratios for Failing to Report Being Insured in the CPS for Those CPS Cass that were Linked to the MSIS and Were Receiving Full Benefit Medicaid at Some Point During the Last Year

Variables	Report No Medicaid	Report Uninsured
State		
Alabama	1.29 *	1.77 *
Alaska	1.02	0.76 *
Arizona	1.11	1.02
Arkansas	1.43 *	1.45 *
California	0.75 *	0.95
Colorado	1.75 *	1.47 *
Connecticut	1.58 *	0.68 *
Delaware	1.16 *	0.85 *
Florida	1.25 *	1.51 *
Georgia	0.70 *	0.92
Hawaii	1.68 *	0.45 *
Idaho	0.70 *	1.05
Illinois	1.52 *	1.20 *
Indiana	1.62 *	1.42 *
Iowa	1.27 *	1.18 *
Kansas	1.30 *	1.15 *
Kentucky	1.53 *	1.43 *
Louisiana	1.50 *	1.55 *
Maine	1.14	0.84 *
Maryland	2.05 *	1.54 *
Massachusetts	0.51 *	0.43 *
Michigan	0.56 *	0.62 *

State odds ratios

Table 3: Odds Ratios for Failing to Report Being on Medicaid in the 2000 or 2001 CPS and Odd Ratios for Failing to Report Being Insured in the CPS for Those CPS Cass that were Linked to the MSIS and Were Receiving Full Benefit Medicaid at Some Point During the Last Year

Variables	Report No Medicaid	Report Uninsured
Minnesota	0.93	0.59 *
Mississippi	0.64 *	1.03
Missouri	0.74 *	0.91
Montana	0.49 *	0.84 *
Nebraska	0.90	0.97
Nevada	1.37 *	1.73 *
New Hampshire	0.56 *	0.68 *
New Jersey	1.29 *	1.03
New Mexico	0.85 *	1.18 *
New York	0.80 *	0.96
North Carolina	1.16 *	1.15 *
North Dakota	1.00	1.71 *
Ohio	0.73 *	0.86
Oklahoma	1.49 *	2.27 *
Oregon	0.55 *	0.74 *
Pennsylvania	1.66 *	0.83 *

State odds ratios

Table 3: Odds Ratios for Failing to Report Being on Medicaid in the 2000 or 2001 CPS and Odd Ratios for Failing to Report Being Insured in the CPS for Those CPS Cans that were Linked to the MSIS and Were Receiving Full Benefit Medicaid at Some Point During the Last Year

Variables	Report No Medicaid	Report Uninsured
Rhode Island	0.47 *	0.43 *
South Carolina	1.01	0.93
South Dakota	1.19 *	1.57 *
Tennessee	0.73 *	0.59 *
Texas	1.15 *	1.76 *
Utah	0.75 *	0.97
Vermont	0.50 *	0.70 *
Virginia	1.05	1.21 *
Washington	1.62 *	1.43 *
Washington, D.C.	0.79 *	0.48 *
West Virginia	1.12	1.24 *
Wisconsin	0.73 *	0.59 *
Wyoming	1.06	1.37 *

Source: 2001 and 2002 Expanded Sample CPS ASEC data files Linked to the 2000 and 2001 MSIS

Note: Effect coding (as opposed to dummy coding) was used for all categorical variables except for "Sex" (reference category for sex is female), and the Variable "Zero Family Income Reported" (the reference category was having at least some income --or loss of income reported).

Direct policy-relevant findings raised by this research

- Many people on Medicaid do not report having Medicaid
 - 43% report some other type of coverage or being uninsured
- Many people with Medicaid fail to report any other type of coverage (e.g., over 6 million weighted cases)
- Many people report Medicaid whom we can not link to MSIS (for almost 3 million weighted cases its there only type of insurance)
 - These are serious problems for policy simulations/evaluations of Medicaid using the CPS

Why do people fail to report Medicaid?

- Stigma of being enrolled in public program
 - Leads people not to report Medicaid but they would report other type of coverage
- They do not know the program name, but know they have coverage
 - Leads people not to report Medicaid but report some other type of coverage
- General lack of knowledge of the status of others in the household
 - E.g., proxy reporting errors
- They do not know they are enrolled in any insurance coverage
 - Leads people to report being uninsured
 - Do they also have health outcomes more like the uninsured?

State variation in Medicaid enrollees reporting

- Can “survey measurement error” be a program evaluation tool
- Logic flow:
 - People who have coverage and those living with them should know this for it to impact their health
 - There will always be some base level of reporting error given the difficulty associated with measuring health insurance
 - A single fallible survey instrument given in a similar manner in all 50 states and DC
 - Control for selected covariates

 - ***Remaining State variation in results may point to programmatic issues that can be altered to improve health***

State variation and thinking about the survey as an evaluation tool

- State variation in the reporting of Medicaid
 - Not as problematic and likely due to many things (e.g., MD)
- State variation in reporting Uninsured for Medicaid enrollees is more troubling
 - Do these enrollees actually have health outcomes more similar to the uninsured?
 - How does it impact SCHIP allocations, which use the CPS to allocate funds to states based on the estimate of poor uninsured kids?
 - Is the cause that some states do a better job of communicating enrollment and its benefits than others?
 - Improving communication within states could improve health for the already enrolled but unaware

Next steps in our SNACC project plan

- Develop an imputation model for Medicaid coverage and adjust Medicaid and uninsured numbers in CPS
- Finalize similar analysis on the National Health Interview Survey
 - Report is in final stages of review
- Perform a similar analysis with the Medical Expenditure Panel Survey (HC)
 - Basic tables are completed
- Census is working on a similar analysis on the American Community Survey
- Try to get a better handle on SCHIP and how it impacts reporting errors

Other issues to keep in mind

- Measuring health insurance coverage with a survey is an especially difficult task
- From this work, we only have information on those people with Medicaid reporting incorrectly
 - Would be nice to know about other types of coverage (SCHIP and private)
 - We also need to know whether people without coverage report having it

**Thanks to the many people who have
made this work possible!
Special Thanks to
Mike O'Grady and Linda Bilheimer**

Contact information

- **Michael Davern**
State Health Access Data Assistance Center (SHADAC),
University of Minnesota
 - daver004@umn.edu
 - 612-624-4802