Accuracy of Medicaid reporting in the ACS: Preliminary results from linked data

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Introduction

The "Medicaid undercount" refers to the discrepancy between administrative counts of Medicaid enrollment and estimates from survey data. Nearly all state and federal surveys estimate fewer Medicaid enrollees than is described by enrollment records. In the 2005 Current Population Survey (CPS) 40.8% of people known to have Medicaid from administrative records were not reported as having Medicaid in the CPS (SNACC Phase V, 2010). In the 2002 National Health Interview Survey (NHIS) the undercount was 33.5% (SNACC Phase IV, 2009) and in the 2003 Medical Expenditure Panel Survey Household Component (MEPS/HC) it was 17.5% (SNACC Phase VI, 2010).[1] State sponsored surveys often fare better, but still tend to undercount Medicaid by 12-26% (Call, Davern, Klerman & Lynch, 2013). This mismatch suggests that survey data, relative to what is known from administrative data, give biased estimates of key policy measures such as the share of the population covered by Medicaid or those lacking health insurance. Although survey data on Medicaid is likely biased, unlike administrative data, surveys provide a wide array of policy relevant covariates such as access to health services, health status, and race and ethnicity, and surveys are the only source of information about the uninsured and the eligible but not enrolled.

This working paper presents preliminary results from a collaboration between SHADAC and the U.S. Census Bureau that extends prior research on the CPS, NHIS and MEPS/HC (Call et al., 2013; Davern, Klerman, Baugh, Call, & Greenberg, 2009a; SNACC Phases II-VI, 2008-2010)[1] to the American Community Survey (ACS). The ACS began collecting information on health insurance coverage in 2008. Since that time the ACS has become an important source of information for monitoring health insurance coverage and evaluating health policy.[2] The ACS is a unique data asset because its large sample size makes it possible to produce statistically reliable single year health insurance estimates at the national, state and sub-state levels (Davern, Quinn, Kenny & Blewett, 2009b). It can also be used to monitor important, but relatively small sub-groups like minority children in poverty. Other federal surveys lack the necessary sample size to adequately monitor these geographic and demographic groups on an annual basis.

Compared to more complicated questionnaires like the NHIS or MEPS/HC, the ACS has a simpler health insurance question which could potentially contribute to misclassifying Medicaid enrollees – it lacks state-specific program names, lacks a verification question[3], and has a "laundry list" response option. However, preliminary results in this working paper provide evidence that the ACS "undercount" is in line with other surveys that measure health insurance coverage. Yet caution should be used when comparing ACS results with other surveys as the ACS question captures Medicaid and other means-tested coverage, without the ability to separate out Medicaid coverage like the other surveys.

The only other evidence on the extent to which the ACS misclassifies coverage is limited to the 2006 ACS content test (O'Hara 2009).[4] This working paper is the first research on the Medicaid undercount using the full production ACS. In this paper we describe the coding of Medicaid and other means-tested insurance in the ACS and people known to be enrolled in Medicaid or expansion Children's Health Insurance Program (CHIP) coverage on the day of the survey according to administrative enrollment data. Results are presented

[1] There are six SNACC reports (Phase I – Phase VI) conducted as part of a multi-agency collaboration linking surveys to administrative data. The agencies include SHADAC, the Centers for Medicare and Medicaid Services, The Department of Health and Human Services Assistant Secretary for Planning and Evaluation, the National Center for Health Statistics, and the U.S. Census Bureau. The estimates for the NHIS, CPS and MEPS/HC come from Table 3 of the Phase IV, V and VI reports that include only explicit responses (imputed and edited values are excluded).
[2] See descriptions of the use of the ACS for monitoring health insurance at the state level from SHADAC (http://www.shadac.org/shap/technical-assistance/data/chartbooks) and Kaiser (http://kff.org/uninsured/state-indicator/total-population-2/) and for use creating inputs into models of how the Affordable Care Act (ACA) will impact states see Sonier 2012 and Buettgens et al. 2013.
[3] Many surveys ask respondents that do not report any health insurance type to verify that they lack any coverage. The ACS does not.
[4] In January through March of 2006, the ACS conducted a test of new and modified survey content prior to implementation in 2008. Two versions of a health insurance coverage question were evaluated to determine which worked best in an ACS questionnaire environment (Nelson and Ericson, 2007).

by broad demographic characteristics (i.e., age, poverty, and state of residence). We also report the upper bound of bias to estimates of uninsurance attributable to misclassification of Medicaid.

Methods

To gauge the extent of the Medicaid undercount in the ACS, we link the 2008 ACS to the Medicaid Statistical Information System (MSIS) using a procedure developed by the Census Bureau that anonymizes the data and preserves confidentiality so it can be used for statistical purposes and research. Our approach to the analysis, outlined below, is consistent with prior linkage projects exploring the undercount in federal surveys (Davern et al., 2009a; Call et al., 2013).

MSIS: The MSIS data contain days enrolled per month for people in Medicaid and CHIP programs that operate as part of a state's Medicaid program (so called expansion CHIP or M-CHIP). The MSIS tracks enrollment in all benefit categories including full benefits and partial benefits (i.e., only specific services such as emergency care are provided). States provide these data to the Centers for Medicare and Medicaid Services (CMS) which in turn cleans the data and notes unresolvable anomalies (Czajka, 2012). Prior to linking the MSIS to the ACS, we de-duplicate the MSIS so that each record corresponds to an individual person and we remove deceased individuals.

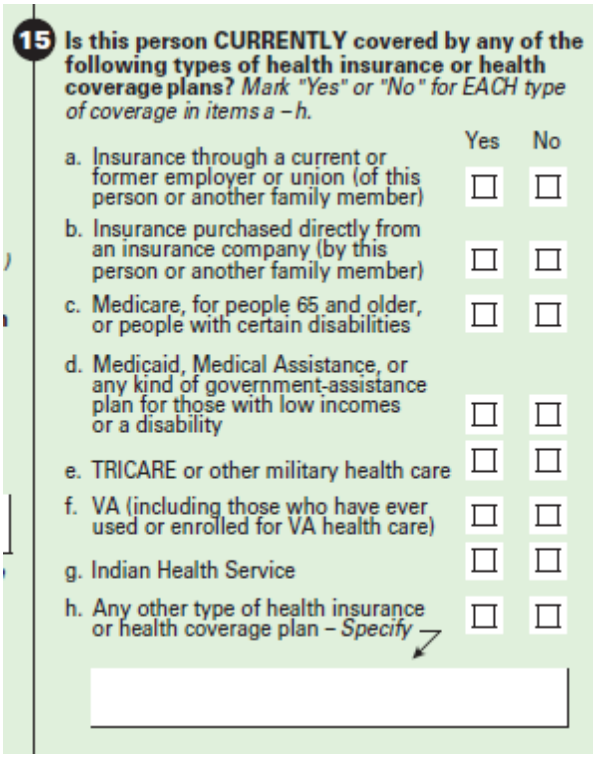
ACS: The ACS is a general population survey conducted by the Census Bureau on an annual basis. The survey is primarily conducted by mail, with telephone and in-person non-response follow up. The Census Bureau's internal version of the 2008 ACS contains over 4 million person records. To ensure the confidentially of respondents we use the internal version of the ACS, accessed through the Census Bureau's Minnesota Research Data Center.[5]

The health insurance question shown in Figure 1 collects information about health insurance status on the day of interview. The question classifies people into one or more insurance types and those who report not having any type listed (except for Indian Health Service which is not considered to be comprehensive coverage) are considered to be uninsured. Those that are coded "Yes" to item (d.) are considered to have Medicaid or another means-tested public coverage type. In this working paper our focus is on survey response. Therefore, we include only explicit reports of Medicaid or another means-tested public coverage (imputed and edited responses are omitted).[6] Our estimates reflect the civilian noninstitutionalized population (U.S. Census Bureau, 2008).

[5] While our analysis is based on the internal, restricted use ACS data, the Census Bureau provides a public version of the ACS which has been augmented to protect confidentiality. The so called "Public Use Microdata Sample (PUMS)" is accessible from American Fact Finder or the Integrated Public Use Microdata Series (IPUMS).

[6] We include the same tables of estimates in Appendix B for all values including imputations and edits.

Figure 1. 2008 ACS Health Insurance Item (mail form)



15 **Is this person CURRENTLY covered by any of the following types of health insurance or health coverage plans?** *Mark "Yes" or "No" for EACH type of coverage in items a – h.*

	Yes	No
a. Insurance through a current or former employer or union (of this person or another family member)	☐	☐
b. Insurance purchased directly from an insurance company (by this person or another family member)	☐	☐
c. Medicare, for people 65 and older, or people with certain disabilities	☐	☐
d. Medicaid, Medical Assistance, or any kind of government-assistance plan for those with low incomes or a disability	☐	☐
e. TRICARE or other military health care	☐	☐
f. VA (including those who have ever used or enrolled for VA health care)	☐	☐
g. Indian Health Service	☐	☐
h. Any other type of health insurance or health coverage plan – *Specify*	☐	☐

Note: "Medicaid Plus" is defined as coding of "Yes" to item (d). "Uninsurance" is defined as being coded to "No" for items (a) through (h), excluding (g) which is not considered a comprehensive coverage type. The 2008 Instruction Guide provided with the questionnaire states: "Mark "Yes" or "No" box for each part of question 15. If the person reports any other type of coverage plan in 15h, specify the type of coverage or name of the plan in the write-in box. DO NOT include plans that cover only one type of health care (such as dental plans) or plans that only cover a person in case of an accident or disability."

Linkage and weighting: We link the ACS and MSIS using methods developed at the Census Bureau. Merges are conducted by Protected Identification Key (PIK) which is an anonymous personal identifier assigned based on Personally Identifiable Information (PII) such as Social Security Number or name, date of birth, and address, depending on the data set. The PII are removed from the data file to anonymize the data and preserve confidentiality so it can be used for statistical purposes and research. The presence of PIKs on both the internal ACS and MSIS allows us to merge MSIS records to the ACS file. We use a method similar to what was used in previous linkage work with the National Health Interview Survey (SNACC Phase IV, 2009) to match Medicaid coverage on the interview date in the ACS to eligibility days in the MSIS.[7] A small fraction (about 8%) of ACS records did not have valid PIKs and cannot be merged. To account for these records we re-weight the ACS so that the sum of weights from the sample segment with valid PIKs agrees with the sum of weights from the full file.[8] This is done within health insurance and demographic groups. Similarly 6.7% of

[7] Because the MSIS is a longitudinal database linking an MSIS record to the ACS does not necessarily indicate that the ACS record was enrolled on the date of the ACS interview. If the MSIS indicates that a given record was enrolled for the entire month of interview we consider that record to be a known Medicaid enrollee. If the MSIS suggests that the ACS record was covered for only part of the interview month we use a three-step process: 1) If MSIS suggests enrollment in the entire month prior to interview, but not in the month subsequent, we assume the enrollment period occurred at the beginning of the interview month and consider the ACS record to be enrolled if the interview date occurred in the assumed interview month enrollment period; 2) If MSIS suggests enrollment in the entire month after interview, but not in the month prior, we assume the enrollment period occurred at the end of the interview month and consider the ACS record to be enrolled if the interview date occurred in the assumed interview month enrollment period; 3) If MSIS suggests partial enrollment in the interview month and no (or partial) enrollment in the months prior or subsequent to interview we randomly impute the assumed enrollment period using an algorithm that considers the number of days of enrollment described by MSIS and the total number of days in the month.

[8] After re-weighting we compared the re-weighted estimates to estimates from the full file across a number of characteristics (e.g. age, sex, race and ethnicity, poverty level, and state) to ensure potential bias resulting from missing PIKs has been minimized.

MSIS records lack valid PIKs.[9] Unfortunately, we have no solution to missing PIKs on MSIS. It is possible that a person has an enrollment record on MSIS, but we cannot link them to the ACS because of a missing PIK.

Analytic approach: Analysts are often tempted to compare raw tabulations of the ACS and Medicaid enrollment data in order to gauge the extent to which the ACS undercounts Medicaid enrollment. However, such an exercise would lead to misleading conclusions about the scope of misclassification in the ACS because the two data sources measure distinct constructs. The discrepancy between survey estimates of Medicaid and administrative counts can be decomposed into two components: (1) divergent concept alignment which refers to the extent to which two data sources measure distinct constructs and (2) survey response error. In this working paper we do not address differences in raw counts due to divergent concept alignment and instead address survey response error.

Survey response error occurs when data is incorrectly reported or coded. It often arises from a respondent's misinterpretation of the questions in relation to the survey definition (i.e. confusion about and misclassification of coverage type); the quality of proxy versus direct reporting; underreports due to social stigma; and bias related to recalling enrollment occurring in the past. The latter is not a problem in the ACS as respondents are asked to report health insurance they have on the day of the survey. However, consistent with other surveys that measure insurance at a point-in-time (Call, Davidson, Davern, Nyman, 2008; Call, Davidson, Davern, Brown, Kincheloe, Nelson, 2008/2009), we expect respondents in the ACS will experience confusion that will lead to misreporting insurance coverage for themselves and/or household members. For example, in states where CHIP eligibility is set at the higher end of the poverty guidelines, respondents may be confused by response option (d) shown in Figure 1 above that specifies "low incomes."

In this working paper we define a survey response error as a record that is known to have full-benefit Medicaid or M-CHIP enrollment from the MSIS and is not coded to have Medicaid or other means-tested coverage in the ACS. The MSIS includes both full-benefit and partial-benefit enrollment (e.g., family planning or emergency services), but the ACS instructs respondents not to include plans that only cover one type of health care (see Figure 1 note). Therefore we restrict the MSIS to full benefit coverage to align with the intended ACS definition. In addition, as shown in Figure 1, the ACS question is very general and includes all means-tested public coverage including stand-alone CHIP programs and state-only funded means-tested programs. This enrollment is not included in MSIS because it is either reported inconsistently to the federal government by the states as is the case for stand-alone CHIP programs (Czajka, 2012), or because it is not reported at all to the federal government as is the case for state-only funded means-tested programs. While it is also possible for survey error to run in the other direction – for a case to be falsely coded to Medicaid or other means-tested coverage in the ACS– the nature of our data, as described above, prevents us from estimating this type of error. We examine health insurance responses by age, poverty level, and state of residence.

Accurate estimates of uninsurance are critical to evaluations of health policy and there are dollars attached to these measures in the form of federal and state allocations to reduce rates of uninsurance and provide safety net care (e.g., the size of Disproportionate Share Hospital Payments to states). Using the linked MSIS-ACS data we can partially examine the extent to which misclassification of Medicaid and M-CHIP coverage contributes to bias in the ACS's estimate of uninsurance. Because we lack an external source of information about other coverage types (e.g., employer-sponsored insurance), and we cannot determine the validity of ACS cases coded to Medicaid that may in fact be uninsured, we are limited to considering only a small portion of the potential bias to uninsurance: those who are known to be enrolled in Medicaid and M-CHIP who are reported as uninsured in the ACS. By removing the estimated number of enrollees in Medicaid and M-CHIP found in

[9] In contrast with previous Medicaid Undercount analyses, in this analysis we identify unique PIKs within states.

MSIS from the population estimated to be uninsured in the ACS we calculate the upper bound to bias in uninsurance that is attributable to Medicaid misreporting. That is, after subtracting known enrollees from the count of the uninsured, we know that the true level of bias attributable to Medicaid misreporting can be smaller, but not larger, than our estimate. Other research shows that cases reported as having only Medicaid that cannot be matched to a MSIS record likely offset some of the upward bias in estimates of uninsurance (Davern et al., 2009a).

Findings

First we describe coding of insurance coverage types in the ACS among cases that were linked to the MSIS and are considered to be known Medicaid/M-CHIP enrollees on the date of interview.

Table 1. Coverage type by age for linked cases enrolled in Medicaid on ACS interview date, explicit reports only^

	0-18		19-64		65 and Over		All Ages	
	%	SE	%	SE	%	SE	%	SE
Total Population of Linked Cases (N)	18.8 million		11.5 million		2.5 million		32.8 million	
Any Medicaid Plus*	79.9	0.16	73.0	0.16	75.2	0.32	77.1	0.12
Implied Undercount	20.1	0.16	27.0	0.16	24.8	0.32	22.9	0.12
Not Any Medicaid Plus**								
Employer-sponsored Insurance (ESI)	9.3	0.10	8.1	0.1	1.6	0.08	8.3	0.08
Direct Purchase	2.2	0.06	2.2	0.05	2.4	0.1	2.2	0.05
Medicare	0.9	0.04	2.9	0.05	22.9	0.31	3.3	0.04
TRICARE	0.3	0.02	0.3	0.02	0.1	0.02	0.3	0.01
VA	0.0	0.01	0.2	0.02	0.4	0.03	0.1	0.01
Uninsured	8.2	0.11	14.5	0.14	1.4	0.12	9.9	0.08

Source: 2008 American Community Survey/Medicaid Statistical Information System Linked Data
Note: Columns sum to > 100% as cases can be reported as having multiple types of coverage
*Any Medicaid Plus includes Medicaid only, Medicaid in combination with any other type of coverage, and any means tested coverage.
**ESI, direct purchase, Medicare, TRICARE and VA estimates among cases that do not report Any Medicaid Plus.
^Excludes Medicaid edits and imputations (explicit reports only).

As shown in the last column of Table 1, just over 77% of linked cases are coded in the ACS as having Medicaid or other means-tested insurance (referred to as "Medicaid Plus" from here forward). This implies an undercount of Medicaid/M-CHIP enrollment of 22.9%. In addition, 8.3% of linked cases are coded as having employer-sponsored insurance (ESI) but not Medicaid Plus. Similarly, 2.2% report direct purchase insurance, 3.3% Medicare, 0.3% TRICARE and 0.1% VA. Approximately 10% of known Medicaid/M-CHIP enrollees are reported as having no health insurance. Concordant coding of Medicaid Plus is highest among children (79.9%) and lowest among nonelderly adults (73.0%).

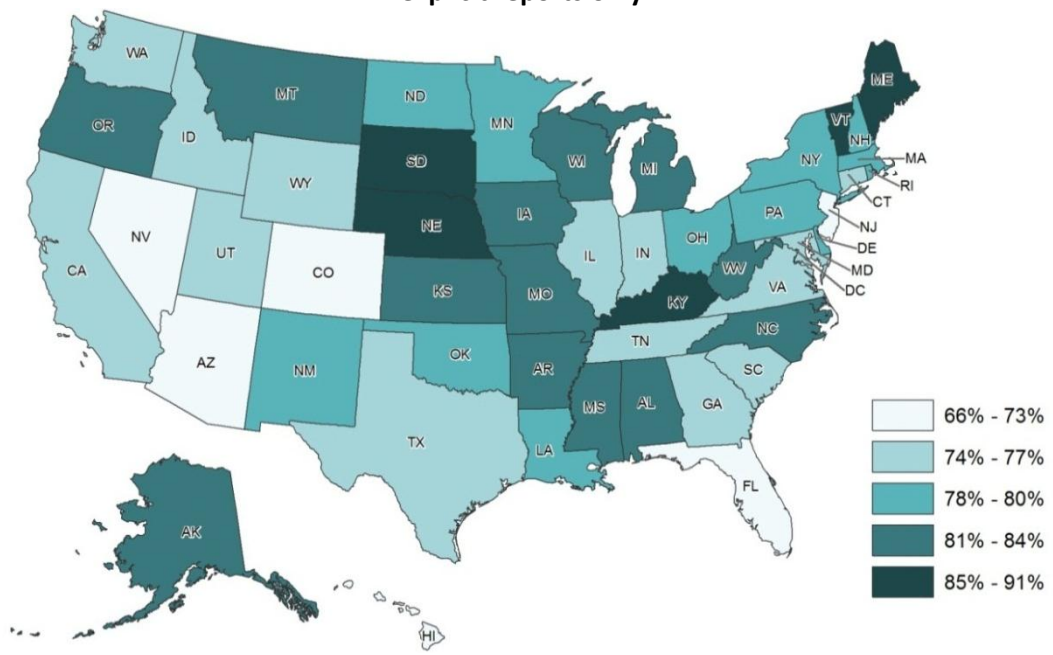
Table 2. Coverage type by poverty for linked cases enrolled in Medicaid on ACS interview date, explicit reports only^

	<=138%		139-200%		201%+	
	%	SE	%	SE	%	SE
Total Population of Linked Cases (N)	20.1 million		5.2 million		7.1 million	
Any Medicaid Plus*	82.9	0.15	71.6	0.33	64.4	0.27
Implied Undercount	17.1	0.15	28.4	0.33	35.6	0.27
Not Any Medicaid Plus**						
Employer-sponsored Insurance (ESI)	3.8	0.08	11.6	0.27	18.5	0.23
Direct purchase	1.5	0.05	2.6	0.12	3.9	0.11
Medicare	2.9	0.05	3.4	0.11	4.4	0.11
TRICARE	0.2	0.01	0.3	0.04	0.5	0.03
VA	0.1	0.01	0.1	0.02	0.2	0.02
Uninsured	9.3	0.11	11.8	0.24	10.3	0.18

Source: 2008 American Community Survey/Medicaid Statistical Information System Linked Data
Note: Columns sum to > 100% as cases can be reported as having multiple types of coverage. The population total of linked cases is slightly smaller here than in Table 1 because some individuals are excluded from the poverty universe.
*Any Medicaid Plus includes Medicaid only, Medicaid in combination with any other type of coverage, and any means tested coverage.
** ESI, direct purchase, Medicare, TRICARE and VA estimates among cases that do not report Any Medicaid Plus.
^Excludes Medicaid edits and imputations (explicit reports only).

Table 2 presents the coding of insurance coverage types across policy-relevant income levels. Reporting accuracy is higher among low income people with 82.9% coded as Medicaid Plus among those with household incomes less than or equal to 138% of the federal poverty threshold (FPT) as compared to 64.4% among those with incomes over 200% FPT. In the higher income group almost 19% report ESI and not Medicaid Plus.

Figure 2. Percent of linked cases enrolled in Medicaid on ACS interview date with Any Medicaid Plus*, explicit reports only^



Source: 2008 American Community Survey/Medicaid Statistical Information System Linked Data
*Any Medicaid Plus includes Medicaid only, Medicaid in combination with any other type of coverage, and any means tested coverage.
^Excludes Medicaid edits and imputations (explicit reports only).

As shown in Figure 2, the extent to which people with enrollment in Medicaid or M-CHIP in the MSIS are reported as having Medicaid Plus coverage in the ACS ranges from as low as 66.3% in Nevada to as high as 90.5% in Vermont. Appendix A presents these data in detail along with the proportion coded as having other coverage (which combines employer-sponsored insurance, direct purchase coverage, Medicare, TRICARE and VA), and those coded as having no coverage in the ACS. Future research using the linked data will explore explanations for discordance between MSIS and ACS reporting by state.

Table 3. Upper bound of bias to uninsurance attributable to Medicaid misreporting, explicit reports only^

	Count	Percent (SE)
Original Uninsured Estimate	40.9 million	15.4 (0.05)
Share of Uninsured that are Linked	3.2 million	7.9^^ (0.07)
Partially Adjusted Uninsured Estimate	37.7 million	14.2 (0.04)

Source: 2008 American Community Survey/Medicaid Statistical Information System Linked Data. ^Excludes edits and imputations (explicit reports only). ^^The base of this percent is the 40.9 million estimated to be uninsured in the previous row.

Because uninsurance is a residual category, or the group coded as "No" to all forms of comprehensive insurance, undercounting Medicaid partially contributes to bias in uninsurance rates. Table 3 provides a rough estimate of the extent to which uninsurance estimates in the ACS may be biased upward due to linked cases that are coded as uninsured in the ACS. The original uninsurance estimate among cases that explicitly report a Medicaid Plus status as "Yes" or "No", after weighting up to the full file, is 15.4% or 40.9 million people.[10] By removing the 7.9% (3.2 million) of the uninsured that are known Medicaid enrollees, we obtain a partially adjusted uninsurance estimate of 14.2% or 37.7 million. Accounting for the 3.2 million linked cases coded as uninsured reduces the uninsured rate by 1.2 percentage points. This analysis suggests that the majority of under reported Medicaid and M-CHIP occurs for cases that report other coverage types rather no coverage at all. The partially adjusted uninsured estimate in Table 3 accounts for only one source of bias. As described earlier, individuals could report Medicaid or other private coverage in the ACS when they are actually uninsured which would offset this bias. Thus, the bias to uninsurance from misreporting Medicaid is likely not higher than 1.2 percentage points.

Discussion

In this working paper we present the first empirical estimates of misclassification to Medicaid and M-CHIP reporting in the American Community Survey. Our analysis suggests that despite the simple format of the ACS question the Medicaid undercount in the ACS is on par if not slightly lower than some other federal population surveys that measure health insurance coverage. However, the comprehensive nature of the ACS "Medicaid Plus" measure makes comparisons with the undercount and measurement error in other federal surveys challenging, as all other surveys ask about Medicaid and other public programs in separate survey items. Additionally, our estimate should be interpreted with some caution. The MSIS is not a perfect gold standard for the ACS and other surveys because of definitional differences, divergent MSIS data quality across states, and incomplete linking identifiers (Blewett, Call, Davern & Davidson, 2005; Davern et al., 2009a). The ACS measure includes Medicaid and other means-tested programs (Medicaid Plus) such as separate CHIP programs and state-only funded programs whereas the MSIS data are restricted to Medicaid and M-CHIP. Some enrollment from the separate CHIP programs might be included in MSIS but because there was no

[10] The "Original Uninsurance Estimate" differs from the official estimate of the Uninsured because this table includes only cases that explicitly report their Medicaid Plus status as "Yes" or "No". Medicaid Plus values that are edited and imputed are excluded.

requirement for states to include this enrollment in 2008, it is not reported on a consistent basis and so is excluded from this analysis.

With these limitations in mind, we estimate that the implied Medicaid undercount among cases that have explicitly reported Medicaid Plus status in the ACS is 22.9%. Previous work suggests that the undercount in the CPS is 40.8%, 33.5% in the NHIS, and 17.5% in the MEPS/HC (SNACC Phases IV-VI, 2009-2010).[1] Because approximately 14% of the linked cases in the ACS are coded as not having Medicaid Plus but having other types of insurance and 9.9% are coded as uninsured (see Table 1), the bias to estimates of uninsurance is smaller than the 22.9% undercount estimate. Using the linked data, we estimate that this undercount in the ACS translates into an overestimate of uninsurance of approximately 1.2 percentage points (or 3.2 million people) which we consider to be an upper bound. This overestimate is likely offset by other reporting error and should only be viewed as a partial adjustment. Other research shows that cases reported as having only Medicaid yet which cannot be matched to an MSIS record offset some of the upper bias in estimates of uninsurance (Davern et al., 2009a). Consistent with other research (Call et al., 2008/09; Call et al., 2008; Davern et al., 2009a) we find that survey response error is greater at higher levels of income and among non-elderly adults. In addition, we found variation by state.

In this working paper we focused on explicit ACS reports therefore our estimates of coverage are not representative of official estimates released by the Census Bureau. In Appendix B we replicate Tables 1, 2, 3 and Table A-4 in Appendix A for the full distribution of values (reported, imputed, or edited) which are more reflective of official Census Bureau estimates.

Future research will take a closer look at state-level variation. We will explore variation in concordance among other important subgroups within the linked data such as by education, race and ethnicity, language of interview, enrollment in Medicaid managed care, as well as length of Medicaid and M-CHIP enrollment. The ACS also offers a unique opportunity to examine concordance in reporting among those in group quarters and by survey mode (i.e., mail, telephone, in-person).

Appendix A.

Table A-4. Coverage type by state for linked cases enrolled in Medicaid on ACS interview date, explicit reports only^

	Any Medicaid Plus*		Other Coverage*		Uninsured	
	%	SE	%	SE	%	SE
Alabama	82.3	0.84	11.3	0.75	6.3	0.65
Alaska	80.7	1.90	10.2	1.45	9.1	1.34
Arizona	70.9	0.98	11.7	0.62	17.4	0.78
Arkansas	84.1	0.80	8.9	0.70	7.0	0.52
California	75.1	0.35	13.8	0.22	11.1	0.27
Colorado	72.2	1.46	11.0	0.95	16.8	1.24
Connecticut	76.6	1.40	17.1	1.25	6.3	0.78
Delaware	77.7	2.36	13.5	1.91	8.8	1.61
District of Columbia	83.0	2.04	13.6	1.65	3.4	0.91
Florida	72.5	0.65	12.7	0.51	14.8	0.58
Georgia	75.1	0.75	13.2	0.60	11.8	0.61
Hawaii	72.0	2.28	23.2	2.17	4.8	1.07
Idaho	76.5	1.64	11.3	1.26	12.2	1.14
Illinois	73.4	0.55	17.3	0.46	9.3	0.46
Indiana	76.5	0.89	12.1	0.62	11.4	0.64
Iowa	81.5	0.93	11.0	0.78	7.5	0.68
Kansas	80.4	1.29	9.7	0.76	9.9	1.13
Kentucky	85.8	0.69	8.0	0.52	6.2	0.47
Louisiana	78.2	0.82	12.7	0.60	9.1	0.55
Maine	85.9	0.97	8.4	0.78	5.7	0.64
Maryland	75.0	1.01	16.5	0.91	8.5	0.61
Massachusetts	79.8	0.82	17.5	0.78	2.7	0.30
Michigan	82.3	0.56	10.9	0.46	6.8	0.40
Minnesota	78.0	0.87	14.4	0.77	7.6	0.52
Mississippi	80.2	1.10	9.3	0.81	10.5	0.79
Missouri	82.8	0.75	9.3	0.62	7.9	0.52
Montana	81.1	2.12	10.5	1.58	8.3	1.65
Nebraska	85.4	1.29	9.1	0.87	5.5	0.86
Nevada	66.3	2.48	13.4	1.67	20.4	2.40
New Hampshire	78.6	2.20	13.7	1.82	7.7	1.29
New Jersey	72.4	1.08	16.5	0.90	11.0	0.65
New Mexico	77.4	1.43	10.0	0.88	12.7	1.19
New York	79.1	0.42	13.8	0.34	7.1	0.28
North Carolina	81.1	0.65	10.1	0.45	8.8	0.48
North Dakota	78.6	2.54	12.5	1.66	8.9	1.91
Ohio	78.1	0.57	13.2	0.44	8.7	0.40
Oklahoma	77.4	0.74	12.8	0.64	9.7	0.58
Oregon	81.0	1.31	10.2	0.87	8.8	1.11
Pennsylvania	78.4	0.61	15.4	0.54	6.1	0.37
Rhode Island	77.8	2.23	17.4	1.98	4.8	1.07
South Carolina	75.4	1.00	13.9	0.81	10.6	0.75
South Dakota	86.5	1.78	7.1	1.25	6.4	0.96
Tennessee	75.1	0.78	16.7	0.66	8.2	0.57
Texas	75.2	0.45	9.7	0.27	15.1	0.41
Utah	74.1	2.05	11.0	1.28	15.0	1.89
Vermont	90.5	0.96	7.6	0.89	1.9	0.56
Virginia	75.5	1.06	14.8	0.91	9.8	0.63
Washington	74.8	0.88	14.2	0.82	11.0	0.70
West Virginia	83.7	0.99	8.4	0.71	8.0	0.83
Wisconsin	81.2	0.90	12.2	0.74	6.6	0.52
Wyoming	76.2	3.06	13.9	2.72	9.9	2.01

Source: 2008 American Community Survey/Medicaid Statistical Information System Linked Data

*Any Medicaid Plus includes Medicaid only, Medicaid in combination with any other type of coverage, and any means tested coverage. Other coverage includes ESI, direct purchase, Medicare, TRICARE and VA.

^Excludes Medicaid edits and imputations (explicit reports only).

Appendix B: All Values.

Table B-1. Coverage type by age for linked cases enrolled in Medicaid on ACS interview date, all values^

	0-18		19-64		65 and Over		All Ages	
	%	SE	%	SE	%	SE	%	SE
Total Population of Linked Cases (N)	20.3 million		12.4 million		2.8 million		35.6 million	
Any Medicaid Plus*	79.2	0.15	71.3	0.15	73.1	0.31	75.9	0.11
Implied Undercount	20.8	0.15	28.7	0.15	26.9	0.31	24.1	0.11
Not Any Medicaid Plus**								
Employer-sponsored Insurance (ESI)	9.9	0.10	9.2	0.09	3.2	0.09	9.1	0.07
Direct Purchase	2.3	0.06	2.6	0.06	3.9	0.11	2.6	0.04
Medicare	0.8	0.03	3.1	0.05	25.0	0.29	3.5	0.04
TRICARE	0.4	0.02	0.3	0.02	0.4	0.03	0.3	0.01
VA	0.0	0.01	0.3	0.02	0.6	0.04	0.2	0.01
Uninsured	8.3	0.10	14.7	0.13	1.4	0.12	10.0	0.07

Source: 2008 American Community Survey/Medicaid Statistical Information System Linked Data
Note: Columns sum to > 100% as cases can report and be coded as having multiple types of coverage
*Any Medicaid Plus includes Medicaid only, Medicaid in combination with any other type of coverage, and any means tested coverage.
** ESI, direct purchase, Medicare, TRICARE and VA estimates among cases that do not report Any Medicaid Plus.
^All values including imputations and logical edits are included.

Table B-2. Coverage type by poverty for linked cases enrolled in Medicaid on ACS interview date, all values^

	<=138%		139-200%		201%+	
	%	SE	%	SE	%	SE
Total Population of Linked Cases (N)	21.6 million		5.7 million		7.9 million	
Any Medicaid Plus*	82.3	0.14	70.5	0.31	62.1	0.25
Implied Undercount	17.7	0.14	29.5	0.31	37.9	0.25
Not Any Medicaid Plus**						
Employer-sponsored Insurance (ESI)	4.1	0.07	12.4	0.25	20.5	0.22
Direct purchase	1.7	0.05	3	0.11	4.5	0.11
Medicare	3.1	0.05	3.6	0.11	4.9	0.1
TRICARE	0.2	0.01	0.4	0.04	0.6	0.03
VA	0.1	0.01	0.2	0.02	0.3	0.02
Uninsured	9.5	0.11	11.7	0.22	10.4	0.17

Source: 2008 American Community Survey/Medicaid Statistical Information System Linked Data
Note: Columns sum to > 100% as cases can report and be coded as having multiple types of coverage. The population total of linked cases is slightly smaller here than in Table B-1 because some individuals are excluded from the poverty universe.
*Any Medicaid Plus includes Medicaid only, Medicaid in combination with any other type of coverage, and any means tested coverage.
**ESI, direct purchase, Medicare, TRICARE and VA estimates among cases that do not report Any Medicaid Plus.
^All values including imputations and logical edits are included.

Table B-3. Upper bound of bias to uninsurance attributable to Medicaid misreporting, all values^

	Count	Percent (SE)
Original Uninsured Estimate	42.9 million	14.6 (0.04)
Share of Uninsured that are Linked	3.6 million	8.3^^ (0.07)
Partially Adjusted Uninsured Estimate	39.4 million	13.4 (0.04)

Source: 2008 American Community Survey/Medicaid Statistical Information System Linked Data
^All values including imputations and logical edits are included. ^^The base of this percent is the 42.9 million estimated to be uninsured in the previous row.

Table B-4. Coverage type by state for linked cases enrolled in Medicaid on ACS interview date, all values^

	Any Medicaid Plus*		Other Coverage*		Uninsured	
	%	SE	%	SE	%	SE
Alabama	80.5	0.86	12.9	0.77	6.7	0.62
Alaska	79.1	1.84	11.3	1.44	9.6	1.26
Arizona	69.8	0.94	12.8	0.62	17.3	0.76
Arkansas	82.9	0.81	9.9	0.71	7.2	0.50
California	74.3	0.33	14.6	0.21	11.1	0.24
Colorado	70.8	1.37	12.2	0.90	17.0	1.19
Connecticut	75.3	1.37	18.1	1.18	6.6	0.75
Delaware	76.9	2.40	14.1	1.94	9.0	1.55
District of Columbia	81.6	2.01	15.0	1.65	3.4	0.85
Florida	71.6	0.63	13.5	0.48	14.9	0.53
Georgia	73.7	0.74	14.1	0.58	12.2	0.58
Hawaii	69.2	2.17	25.5	1.98	5.3	0.95
Idaho	75.5	1.61	12.3	1.31	12.1	1.08
Illinois	72.5	0.53	18.1	0.45	9.5	0.43
Indiana	75.5	0.85	12.9	0.58	11.6	0.63
Iowa	79.4	0.91	12.9	0.77	7.7	0.68
Kansas	79.3	1.25	10.9	0.74	9.8	1.08
Kentucky	84.7	0.71	9.0	0.55	6.3	0.45
Louisiana	77.1	0.78	13.7	0.58	9.2	0.51
Maine	84.3	1.05	9.7	0.83	6.0	0.68
Maryland	73.3	0.94	18.0	0.89	8.7	0.54
Massachusetts	78.4	0.76	18.7	0.73	2.9	0.28
Michigan	80.7	0.56	12.3	0.48	7.0	0.38
Minnesota	76.5	0.81	15.8	0.74	7.7	0.49
Mississippi	79.6	1.03	9.9	0.76	10.5	0.76
Missouri	81.0	0.75	10.8	0.65	8.2	0.48
Montana	79.8	2.10	11.4	1.55	8.8	1.63
Nebraska	83.5	1.28	10.3	0.84	6.2	0.84
Nevada	65.8	2.35	14.7	1.60	19.5	2.24
New Hampshire	77.1	2.15	15.5	1.82	7.4	1.20
New Jersey	71.2	1.03	17.7	0.86	11.1	0.62
New Mexico	76.0	1.39	11.1	0.88	13.0	1.07
New York	77.8	0.41	15.0	0.34	7.2	0.27
North Carolina	79.5	0.63	11.4	0.45	9.1	0.45
North Dakota	77.2	2.53	13.7	1.65	9.1	1.88
Ohio	76.9	0.52	14.2	0.42	8.8	0.39
Oklahoma	76.0	0.74	13.7	0.64	10.2	0.57
Oregon	79.3	1.31	12.0	0.94	8.7	1.02
Pennsylvania	76.8	0.54	16.9	0.49	6.3	0.33
Rhode Island	76.8	2.05	18.0	1.80	5.1	1.04
South Carolina	73.7	0.96	15.5	0.76	10.8	0.69
South Dakota	84.9	1.82	8.4	1.27	6.7	0.95
Tennessee	74.2	0.74	17.6	0.63	8.2	0.55
Texas	74.4	0.42	10.5	0.25	15.1	0.39
Utah	73.0	1.97	11.9	1.28	15.1	1.77
Vermont	88.0	1.05	9.9	1.01	2.1	0.55
Virginia	73.9	0.98	16.0	0.83	10.2	0.64
Washington	74.1	0.84	15.1	0.80	10.8	0.66
West Virginia	83.1	0.97	8.9	0.73	7.9	0.78
Wisconsin	79.5	0.81	13.8	0.69	6.7	0.47
Wyoming	75.9	2.94	14.6	2.64	9.5	1.93

Source: 2008 American Community Survey/Medicaid Statistical Information System Linked Data

*Any Medicaid Plus includes Medicaid only, Medicaid in combination with any other type of coverage, and any means tested coverage. Other coverage includes ESI, direct purchase, Medicare, TRICARE and VA.

^All values including imputations and logical edits are included.

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About SHADAC

The University of Minnesota's State Health Access Data Assistance Center (SHADAC) helps states monitor rates of health insurance coverage and understand factors associated with uninsurance. SHADAC provides targeted policy analysis and technical assistance to states that are conducting their own health insurance surveys and/or using data from national surveys. SHADAC's work is funded by the Robert Wood Johnson Foundation. More information is available at www.shadac.org.