

Health Insurance Coverage in the Current Population Survey: Estimates from the 2017 Research File

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Objective: To compare health insurance coverage estimates between the Current Population Survey Annual Social and Economic Supplement (CPS ASEC) production and research files.

Data Sources/Study Setting: The 2017 CPS ASEC and 2017 CPS ASEC Research File.

Study Design: The 2017 CPS ASEC Research File introduces a new processing system for reformatting questionnaire output, reconciling inconsistent answers, and imputing missing data. We compare key estimates from the production and research files to examine how coverage estimates differ across the two files. We pay particular attention to combinations of coverage, as well as to differences for 19-64 year-olds and across income-to-poverty ratio.

Data Collection/Extraction Methods: Census Bureau computer-assisted personal interviews and computer-assisted telephone interviews.

Principal Findings: As expected, health insurance coverage in 2016 was higher in the research file than in the production file. However, the percentage of people covered by private or public coverage were lower in the research file than in the production file due to a decline in the percentage of people covered by both private and public insurance. Stratified results suggest that many of these changes were larger for lower income groups and adults ages 19 to 64.

Conclusions: The CPS ASEC is a vital resource for measuring insurance coverage. The new method for processing data improves estimates of health insurance coverage and addresses many previously noted limitations of the CPS ASEC data.

¹ This paper is released to inform interested parties of research and evaluation and to encourage discussion. The views expressed on statistical, measurement, or methodological issues are those of the authors and not necessarily those of the U.S. Census Bureau. The Census Bureau reviewed this data product for unauthorized disclosure of confidential information and has approved the disclosure avoidance practices applied to this release. CBDRB-FY19-ROSS-B0047.

Researchers and government agencies rely on federal surveys, particularly the Current Population Survey Annual Social and Economic Supplement (CPS ASEC), to measure health insurance coverage. CPS ASEC estimates are used to allocate billions of dollars in children's health insurance funds (Davern et al., 2003) and to score Congressional legislation (Glied et al., 2002). The CPS ASEC is also a particularly valuable source of information about variation in coverage across economic and demographic groups. As a result, the CPS ASEC is one of the most cited sources for health insurance coverage estimates (Davern and Blewett, 2006).

A large body of research has evaluated the quality of CPS ASEC health insurance data and identified some key limitations (see U.S. Census Bureau, 2015 for an overview). Namely, the CPS ASEC health insurance questions (Hess et al., 2001; Pascale, 1999) and imputation process (Davern, 2007; Kenney and Lynch, 2010) tended to underestimate coverage.

The 2017 CPS ASEC Research File addresses some of these limitations and introduces updated, modern strategies for cleaning and imputing demographic, income, and health insurance data. This is the second major step in a redesign of the health insurance section, and seeks to improve data quality amid a changing health insurance landscape.

CPS ASEC Questionnaire Redesign

Although our present focus is on changes to cleaning and imputation, this redesign was enabled by and built upon a redesign of the health insurance questions. As the CPS ASEC captured less coverage in comparison with other federal surveys (Hess et al., 2001; Kenney and Lynch, 2010; Pascale, 1999), a redesigned questionnaire was implemented. It uses an adaptive design to start with broad questions followed by narrower questions to ensure that all sources of coverage are captured (Pascale, Boudreaux, and King, 2016; U.S. Census Bureau, 2015). This redesigned questionnaire improved respondent

reporting (e.g., Pascale, Boudreaux, and King, 2016) and coverage estimates (Medalia et al., 2015; O’Hara and Vornovitsky, 2018).

Revisions for the Research File

However, to ensure timely data release, the Census Bureau could not simultaneously address other areas for data quality improvement. Data cleaning and imputation procedures established for the traditional, pre-redesign questionnaire were adapted to handle data from the redesigned questionnaire. This procedure could not fully utilize the rich data available from the redesigned health insurance questions (U.S. Census Bureau, 2019a).

With the 2017 CPS ASEC Research File, the Census Bureau has begun to implement a new processing system that incorporates additional information from the redesigned questionnaire. Specifically, the system (1) introduces a new method of estimating coverage that builds from subannual estimates to determine whether a person was covered at any point in the previous calendar year, and (2) refines the methods by which respondents’ data are cleaned, imputed, and weighted. The file also includes additional information about types of coverage held at the time of survey and details about Marketplace coverage that were not previously available (U.S. Census Bureau, 2019a).

Details about these changes are described elsewhere (e.g., Berchick and Jackson, 2019; U.S. Census Bureau, 2019a, 2019b). However, three key features warrant explicit mention here. First, the CPS ASEC collects information about which months coverage was held (see Pascale, Boudreaux, and King, 2016). In turn, this subannual information is used to determine whether a person was covered at any point in the previous calendar year.

Second, the imputation strategy for households in which all people are missing health insurance information has been updated. Prior research identified limitations with the imputation strategy (Davern, 2007; Davern et al., 2004), and this process now occurs simultaneously for all members of a health insurance unit (HIU; SHADAC, 2012), rather than carrying forward information from the person assumed to be the plan policyholder to other household members.

Third, other aspects of imputation of incomplete and missing data have been refined. In the CPS ASEC, missing data are generally imputed through the use of hotdecks (U.S. Census Bureau, 2017; see Andridge and Little, 2010). The research file contains refinements to income, age, and family characteristics (U.S. Census Bureau, 2019b), which are used to match cases as part of hotdecking. Other refinements made to the imputation procedure have also allowed more respondent characteristics to be used in hotdecks when imputing health insurance coverage.

Current paper

We examine how changes to data cleaning, imputation, and weighting have affected health insurance coverage in the CPS ASEC by comparing estimates from the 2017 CPS ASEC production and research files. Both files use the same underlying data collected from respondents but differ in their processing. Given their importance for researchers and policymakers, we focus on prior-year coverage estimates, i.e. coverage held during 2016.

Although all data go through the same set of data cleaning and imputation processes, changes to procedures likely do not affect all population subgroups and types of coverage identically. Because children can be covered by certain health programs and dependent coverage and older adults have near-universal coverage (Berchick, Hood, and Barnett, 2018), we examine present detailed estimates for adults ages 19-64.

Data and Methods

The CPS ASEC is a survey of about 68,000 households that collects information on respondents' demographic, social, and economic characteristics (U.S. Census Bureau, 2017).² For 2017, the Census Bureau has produced these two files that use the same survey responses, but processed differently. The first file is the production file, which mapped respondents' data to existing data format in order to clean and to impute missing or incomplete data. The second file is the research file, which uses the redesigned processing system described above.

We compare key estimates from the new processing system with estimates from the legacy processing system. We compare the percentage of the population with any health insurance coverage as well as with specific types and combinations of coverage. We then focus on variation in coverage for 19-64 year-olds, with an emphasis on examining differences by age, income to poverty ratio, and state Medicaid expansion status. All estimates are weighted to the civilian noninstitutionalized population as of March 2017, and standard errors reflect the use of replicate weights (U.S. Census Bureau, 2017).

To increase comparability between the two files, we make two important changes. First, we exclude infants who were born after the prior calendar year (i.e. who were born between January 2017 and the date of interview) from the production file.³ Second, the public and private coverage recode variables in the research file characterize TRICARE as private coverage and VA Care and CHAMPVA as public coverage. As the legacy processing system cannot distinguish between types of military coverage, we treat all military coverage as public.⁴

² For information on confidentiality protection, sampling error, nonsampling error, and definitions in the Current Population Survey, see <<https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar17.pdf>>.

³ A subset of infants born after the reference period were inadvertently allowed to have coverage in the 2017 research file. However, to maintain consistency, we use the same set of infants as the published file.

⁴ See Berchick & Jackson, 2018 for how differences in definitions affect coverage estimates.

We examined whether differences between estimates were statistically significant ($p < 0.05$) using two-tailed tests. However, these tests are ultimately conservative, as both files are based on the same underlying data and instrument. Sampling error and measurement error resulting from question wording do not differ between the production and research files.

Results

Percentage of People with Coverage

One of the motivations behind redesigning the processing system is that CPS ASEC tended to produce lower health insurance coverage estimates than other federal surveys. Consistent with this motivation, the percentage of people with coverage at any point during 2016 was higher in the research file than in the production file (Table 1). For the civilian non-institutionalized population alive during 2016, the estimate of the health insurance coverage rate in the 2017 CPS ASEC Research File was 92.14 percent, about 0.82 percentage points higher than in the production file.

[Table 1 about here]

Private coverage, however, was lower in the research file (65.88 percent) than in the production file (67.58 percent), driven by declines in both employer-sponsored coverage and direct-purchase coverage with the redesigned processing system. The decrease in employer-sponsored insurance was relatively small (0.70 percent). However, the decline in direct-purchase coverage was appreciably larger (4.41 percent).⁵

⁵ The research file contains information about the type of direct-purchase insurance (non-Marketplace, unsubsidized Marketplace, subsidized Marketplace). As the production file does not contain this detail, we do not provide estimates in this paper.

Table 1 also shows that public coverage was lower with the redesigned processing system: 37.25 percent in the production file versus 36.40 percent in the research file. Consistent with this decline and contrary to expectations, Medicaid coverage decreased from 19.41 percent of the population in the production file to 18.91 percent in the research file. That is, Medicaid coverage was significantly lower in the research file than in the production file, despite efforts to reduce the Medicaid undercount in the CPS ASEC (Pascale et al., 2016). The difference was nonetheless substantively modest.

Any Coverage Versus Coverage Alone

A detailed examination of combinations of coverage provides a more nuanced account. The new processing system sought to address higher-than-expected levels of dual coverage, especially the combination of direct-purchase and Medicaid coverage. Therefore, we also examine the percentage of the population covered by key types of coverage alone and/or in combination (Table 2).

[Table 2 about here]

Consistent with expectations, the percentage of the population with two or more types of coverage during 2016 declined by 6.14 percentage points across files. In the research file, 13.50 percent of people had more than one type of coverage. Accordingly, the percentage of people with both private and public coverage is lower in the research file (10.14 percent) than in the production file (13.51 percent).

Examining Medicaid coverage alone and in combination also reveals important heterogeneity. The substantively modest decline in Medicaid coverage is likely driven by a decrease in the percentage of the population with Medicaid in combination with another type, as the percentage of the population with Medicaid alone actually increased significantly. The percentage with Medicaid alone increased from

12.88 percent to 15.11 percent, and the percentage with Medicaid and another type fell from 6.53 percent to 3.80 percent.

In contrast to the estimates for Medicaid, the change in estimates of direct-purchase coverage overall were larger than the change for direct-purchase coverage alone. The research file indicates that 11.83 percent of people had direct-purchase coverage and 6.51 percent had only direct-purchase coverage. The production file, on the other hand, indicates estimates of 16.24 percent and 6.84 percent, respectively.

Adults Ages 19-64

As noted above, we expected to see pronounced changes for adults ages 19-64 given the dynamics of coverage for children and older adults. Table 3 shows differences in estimates between the two files for this group. Positive changes correspond to higher estimates in the research file; negative changes correspond to higher estimates in the production file.

[Table 3 about here]

Coverage increased 1.26 percentage points for 19-64 year-olds with the implementation of the new processing system, which was larger than the 0.82 percentage-point change across all ages. Adults ages 19-64 experienced significant changes across all types of coverage with changes of around one percentage point or greater for most coverage types. Medicaid coverage overall did not significantly change, but, notably, Medicaid coverage alone increased by 1.92 percentage points. This is consistent with a more general reduction in the report of multiple types of coverage: the percentage with two or more types of coverage was 6.32 percentage-points lower in the research file.

We also separately examined two age categories: adults ages 19-25, many of whom are eligible for dependent coverage on a parent's health insurance plan, as well as adults ages 26-64, who are not.

Coverage did not significantly change for the younger age range but coverage increased by 1.45 percentage points for the older group. However, compared with the older group, the younger group had larger changes in private coverage, public coverage, and the combination of the two.⁶ Additionally, only younger adults, ages 19-25, had a decrease in Medicaid coverage.

Many provisions of the Affordable Care Act (ACA) targeted adults ages 19-64 with lower incomes (Buchmueller et al., 2016); therefore, we also stratify the sample by income-to-poverty ratio (IPR) to examine potential ACA-related changes.

These results show a number of statistically and substantively significant changes, including a gradient for private and public coverage.⁷ Private coverage fell 6.81 percentage points for the lowest IPR group, decreased 2.18 percentage points for the middle IPR group, and increased 1.65 percentage points for the highest income group. However, public coverage increased 4.39 percentage points for the lowest income group, did not change for the middle group, and decreased 2.74 percentage points for the highest income group.

Consistent with these more general categories of coverage, people in poverty experienced a 4.93 percentage-point increase in Medicaid coverage and a 6.13 percentage-point decrease in direct-purchase coverage. Indeed, the percentage of adults in poverty with Medicaid alone increased 6.32 percentage-points between the production and research files. Changes in Medicaid generally followed a negative gradient, while changes in direct-purchase insurance generally followed a positive gradient.

To further interrogate whether the new processing system captures the changing health insurance landscape, we examined whether an adult lived in one of the 32 states (including the District of Columbia) that expanded Medicaid eligibility as of January 1, 2016. Coverage estimates changed between files for 19-64 year-olds in both expansion and non-expansion states, but the magnitude of this

⁶ The change in direct-purchase coverage alone was not statistically significant for 19-25 year-olds.

⁷ The difference in changes for private coverage was not statistically different for people with 100-399 IPR compared with people with IPR ≥ 400

change was trending larger for many coverage types in expansion states.⁸ For example, the increase in coverage was about twice as large in expansion states as non-expansion states.

Discussion

Although the 2017 CPS ASEC production and research files draw on the same underlying data, differences in data cleaning, imputation, and weighting result in significant changes to health insurance coverage estimates. In general, coverage increased, especially among 19-64 year-olds, and the report of two or more types of coverage decreased. As prior research found that the legacy processing system underestimated coverage, these differences between the files likely represent an improvement in estimates of health insurance coverage.

We paid close attention to Medicaid and direct-purchase coverage because these coverage types were the primary focus of the redesigned questionnaire and processing system (U.S. Census Bureau, 2015; Pascale, Bourdreaux, and King, 2016). Contrary to expectations, we found no evidence that the new processing system addressed a well-documented (e.g., Davern et al., 2009; Pascale, Roemer, and Resnick, 2009) undercount of Medicaid enrollment in the CPS ASEC.

At first glance, this finding may be surprising; however, it is consistent with past research by Pascale and colleagues (2016), who found that the redesigned questions also did not address the undercount overall but reduced the percentage of people with both private and public coverage. Likewise, we found that the prevalence of Medicaid coverage alone was significantly larger in the research file than in the production file.

⁸ Changes for Medicaid coverage in expansion states and direct-purchase coverage alone in non-expansion states were not significantly different.

Other findings highlight additional data improvements. If the processing system is indeed better able to capture a changing health insurance landscape, we would expect larger changes for groups especially affected by the implementation of the ACA. As many provisions of the ACA focused on 19-64 year-olds and those with lower household incomes (Buchmueller et al., 2016), our age-by-IPR and age-by-expansion stratified results provide such evidence of improvement. For adults 19-64 in poverty, Medicaid coverage is higher and direct-purchase coverage is lower in the research file compared with the production file. The substantively large effects suggest that the new processing system may be better able to distinguish Medicaid from direct-purchase coverage, including subsidized Marketplace plans. Persons with these types of coverage may have difficulty properly classifying which type of coverage they held. With the trend towards cost-sharing in Medicaid plans (Sommers et al., 2018; Wright et al., 2005), this difficulty may persist or even grow in coming years. Yet this distinction is crucial for both researchers of safety net programs and policymakers, and the processing system seems to aid in that distinction.

The larger changes in public and private coverage for 19-25 year-olds than 26-64 year olds also provides suggestive evidence that the new processing system has improved coverage estimates. Particularly, these findings hint that imputation for HIUs instead of households might better capture coverage dynamics for those potentially covered (or not covered) by others who live in the household. Research into this possibility is currently ongoing.

We found that the new processing system increased estimates of insurance coverage, decreased the rate of dual coverage, and had substantively meaningful effects on the composition of insurance coverage for adults ages 19-64. These improvements allow the CPS ASEC to provide the accurate and timely estimates to government agencies and researchers, while offering a richer portrait of the changing health insurance landscape.

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Table 1. Comparison of Estimates of Health Insurance Coverage in 2016, CPS ASEC Research and Production Files

Coverage type	Research File (RF)		Production File (P) ¹		Difference (RF-P)		Signif.
	%	SE	%	SE	%	SE	
Any coverage	92.14	0.10	91.32	0.10	0.82	0.14	***
Any private	65.88	0.23	67.58	0.22	-1.70	0.32	***
Employment-based	55.08	0.24	55.78	0.22	-0.70	0.32	*
Direct-purchase	11.83	0.13	16.24	0.17	-4.41	0.21	***
Any public	36.40	0.20	37.25	0.19	-0.85	0.28	**
Medicare	16.86	0.08	16.70	0.08	0.16	0.11	
Medicaid	18.91	0.18	19.41	0.18	-0.50	0.25	*
Military ²	3.42	0.09	4.57	0.11	-1.15	0.14	***
Uninsured	7.86	0.10	8.68	0.10	-0.82	0.14	***

* p < .05, ** p < .01, ***p<.001

¹ Excludes infants born during 2017 to increase comparability.

² Includes TRICARE, VA, and CHAMPVA for comparability across files. See text for additional information.

SE = standard error

Source: U.S. Census Bureau, 2017 Current Population Survey Annual Social and Economic Supplement (CPS ASEC) Production File and 2017 CPS ASEC Research File

Table 2. Comparison of Estimates of Health Insurance Coverage in 2016, Alone and in Combination, CPS ASEC Research and Production Files

<i>Coverage type</i>	Research File (RF)		Production File (P) ¹		Difference (RF-P)		Signif.
	Rate	SE	Rate	SE	Rate	SE	
Any health plan	92.14	0.10	91.32	0.10	0.82	0.14	*
Any Combination of Coverage	13.50	0.11	19.64	0.14	-6.14	0.18	***
Private and Public ²	10.14	0.10	13.51	0.12	-3.37	0.15	***
Medicaid	18.91	0.18	19.41	0.18	-0.50	0.25	*
Medicaid Alone	15.11	0.16	12.88	0.15	2.23	0.22	***
Direct-Purchase	11.83	0.13	16.24	0.17	-4.41	0.21	***
Direct-Purchase Alone	6.51	0.10	6.84	0.10	-0.33	0.14	*

* p < .05, ** p < .01, ***p<.001

¹ Excludes infants born during 2017 to increase comparability.

² Private coverage includes employer-sponsored and direct-purchase coverage. Public coverage includes Medicare, Medicaid, and all types of military coverage (TRICARE, VA, and CHAMPVA) for comparability across files. See text for additional information.

SE = standard error

Source: U.S. Census Bureau, 2017 Current Population Survey Annual Social and Economic Supplement (CPS ASEC) Production File and 2017 CPS ASEC Research File

Table 3. Percentage-Point Change in Selected Health Insurance Coverage Estimates, Adults Ages 19 to 64, 2017 CPS ASEC Production and Research Files

	Any Coverage	Private Coverage ¹	Public Coverage ¹	Private and Public Cov.	Medicaid	Medicaid Alone	Direct-Purchase	Direct Alone	2+ Types
All	+1.26 (0.19)***	-0.96 (0.33)***	-0.71 (0.30)***	-2.93 (0.13)***	-0.23 (0.26)	+1.92 (0.22)***	-4.74 (0.23)***	-0.33 (0.19)***	-6.32 (0.17)***
Age									
19-25	+0.20 (0.50)	-2.60 (0.69)***	-1.76 (0.69)***	-4.56 (0.34)***	-1.49 (0.59)***	+2.43 (0.49)***	-4.68 (0.53)***	-0.42 (0.44)	-7.36 (0.41)***
26-64	+1.45 (0.20)***	-0.66 (0.34)***	-0.51 (0.30)***	-2.63 (0.13)***	+0.01 (0.25)	+1.82 (0.22)***	-4.75 (0.24)***	-0.31 (0.19)**	-6.13 (0.17)***
Income-to-Poverty Ratio									
<100	-0.07 (0.74)	-6.81 (0.83)***	+4.39 (0.92)***	-2.35 (0.32)***	+4.93 (0.94)***	+6.32 (0.83)***	-6.13 (0.66)***	-3.41 (0.59)***	-3.11 (0.46)***
100-399	+0.84 (0.32)***	-2.18 (0.47)***	+0.09 (0.43)	-2.93 (0.20)***	+0.40 (0.40)	+2.71 (0.35)***	-4.10 (0.33)***	+0.14 (0.28)	-6.09 (0.27)***
400+	+1.99 (0.21)***	+1.65 (0.28)***	-2.74 (0.29)***	-3.08 (0.18)***	-2.12 (0.20)***	+0.06 (0.13)	-5.01 (0.32)***	+0.00 (0.26)	-7.35 (0.25)***
Medicaid Expansion State ²									
Nonexpan.	+0.80 (0.36)***	-0.48 (0.52)*	-1.17 (0.48)***	-2.45 (0.2)***	-0.35 (0.32)*	+1.02 (0.27)***	-3.90 (0.34)***	+0.06 (0.30)	-5.69 (0.27)***
Expan.	+1.56 (0.24)***	-1.27 (0.41)***	-0.40 (0.39)*	-3.24 (0.18)***	-0.14 (0.36)	+2.51 (0.31)***	-5.29 (0.31)***	-0.59 (0.24)***	-6.74 (0.25)***

* p < .05, ** p < .01, ***p<.001

¹For comparability, private coverage is defined as employer-based or direct-purchase coverage, and public coverage is defined as Medicare, Medicaid, or military coverage

²Medicaid expansion status as of January 1, 2016. See Barnett and Berchick, 2017 for a list of expansion states.

Source: U.S. Census Bureau, 2017 Current Population Survey Annual Social and Economic Supplement (CPS ASEC) Production File and 2017 CPS ASEC Research File