Updates to the Processing of Out-of-Pocket Medical Expenditures and Medicare Premiums

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Key Takeaways:

- The U.S. Census Bureau recently completed implementation of a two-stage survey redesign to the CPS ASEC. The first stage introduced a redesign of the CPS ASEC questionnaire in 2014. The second stage, unveiled in 2019, updated the processing system for extracting, imputing, and weighting survey data. [1]
- The updated processing system introduces a number of improvements to the imputation of missing and incomplete information for out-of-pocket medical expenditures and the estimation of Medicare premiums.
- New measures of out-of-pocket medical spending and Medicare premium spending accompany existing measures.
- Measures of out-of-pocket medical expenditures and Medicare premiums are not comparable across legacy and updated processing systems.

Background:

The U.S. Census Bureau has recently completed a two-stage survey redesign of the Current Population Survey Annual Social and Economic Supplement (CPS ASEC). For calendar year 2013, a redesigned questionnaire (the 2014 CPS ASEC) was introduced to improve capture of many survey items, including health insurance and medical expenditures.[2] In 2019, an updated processing system was introduced to better extract, impute, and weight data collected using the redesigned CPS ASEC questionnaire. The 2017 and 2018 files were re-processed using this updated system, and the 2019 CPS ASEC (and future releases) exclusively use the updated processing system. This working paper discusses the updates

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[1] For more information on the updates to the health insurance processing system, see Berchick & Jackson (2019) at: https://www.census.gov/library/working-papers/2019/demo/SEHSD-WP2019-01.html.
[2] For more information on the history of updates to the medical expenditure items in the CPS ASEC, see Janicki (2014) at: https://www.census.gov/content/dam/Census/library/working-papers/2015/demo/Medical-Out-of-pocket-Expenses-CPSASEC-2013-2014.pdf.

made to the processing of out-of-pocket medical expenditures and Medicare premiums and highlights the implications of these changes for the Supplemental Poverty Measure.

Out-of-Pocket Medical Spending and Medicare Premiums in the CPS ASEC:

Estimates of out-of-pocket medical expenditures in the CPS ASEC are derived from a three question series on health insurance premiums, non-premium medical spending, and over-the-counter medical spending.

In addition to these three questions on out-of-pocket medical spending, the CPS ASEC also collects information on Medicare premiums, including whether premiums were deducted from Social Security payments, and the amount paid for Medicare premiums. The imputation of out-of-pocket medical spending and the estimation of Medicare premium spending have been updated and improved to better reflect the current health policy environment.

Updates Made to the Processing of Out-of-Pocket Medical Spending Questions:

Several key improvements have been made to the processing of out-of-pocket medical expenditure content in the CPS ASEC. Chief among these is an improvement to how cases with missing data have their information completed. The CPS ASEC fills in missing information using a method called hotdeck imputation. Hotdeck imputation is a type of imputation which takes information from cases with reported data and assigns it to similar cases that have missing data.

Under the legacy processing system, all cases with missing medical expenditure data had their information completed via sequential hotdeck imputation; that is, each missing medical expenditure and health insurance item was separately imputed. This approach could not fully preserve the relationship between medical expenditures and health insurance. The updated processing system takes into account that families often share insurance and expenses. Under the updated processing system, cases that are missing all information on the health insurance and medical expenditure items have their information imputed jointly for all persons within a health insurance unit. The health insurance unit refers to a group of people within a household who are eligible to share a health insurance plan. [3]

This new approach for imputing medical expenditures and health insurance has a number of advantages. Most notably, for imputed cases, it preserves the relationship between health insurance and medical expenditures at the person and health insurance unit level. In the 2017 CPS ASEC Research File, which was the first file to use the updated processing system, over 20% of cases had their medical expenditure information imputed via this method.[4] Cases that still had missing data were again filled via hotdeck imputation. Under the updated processing system, cases that had missing premium and non-premium medical spending had their information imputed jointly so as to preserve the relationship between premium and non-premium medical spending. Additional characteristics, including the health

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[3] For more information on the health insurance unit, See SHADAC Issue Brief #27 at: https://www.shadac.org/publications/defining-family-studies-health-insurance-coverage.

[4] For more information on this joint imputation, see Jackson (2019) at: https://census.gov/library/working-papers/2019/demo/SEHSD-WP2019-20.html.

insurance unit income-to-poverty ratio and direct purchase insurance subsidy status, were also used when imputing premium, non-premium, and over-the-counter medical spending items so as to better match reported and imputed cases.[5]

Finally, the updated processing system also introduces an alternative method of imputing premium expenses. Past research found a number of logical inconsistencies in how premiums were reported in the CPS ASEC. Respondents sometimes reported that they had a non- or partially subsidized private health insurance plan but would also report that they paid $0 out-of-pocket in health insurance premiums. The updated processing system creates an alternative measure of out-of-pocket premiums, *phip_val2*, which, for cases that have this contradictory reporting, imputes a positive value for out-of-pocket premiums.

Beyond these extensive changes to the imputation procedure, there have been other, more subtle, changes in processing that improve data quality. For example, under the legacy processing system infants who were born in the survey year could have medical expenditures reported on their behalf. The updated processing system only allows people to have positive medical expenditures if they were alive at some point during the previous calendar year, the reference period for the health insurance content. The updated processing system also corrects for logically unlikely scenarios in which a dependent on a health insurance plan reports a positive premium but the plan policyholder does not. Under the updated processing system, these cases have their values switched so that it is the plan policyholder who reports paying the positive premium value. Finally, the updated processing system provides more information on which cases had the imputation and logical corrections described above. To that end, allocation flags are released indicating whether a case is out of universe, reported, item imputed, logically assigned, or whole unit imputed.

Updates Made to the Processing of Medicare Premiums:

Distinct from questions on out-of-pocket medical expenditures, the CPS ASEC collects information on whether a person has Medicare premiums deducted from Social Security and the amount of premiums deducted. If a person reports having Medicare but does not report a Medicare premium, information on Medicare premiums is calculated using administrative guidelines. The legacy processing system used marital status, income, and insurance status to determine if a person should have a Medicare premium and the amount expected to be paid.[5]

The updated processing system introduced a number of improvements to the legacy method. First, the legacy procedure used Medicare premiums and income thresholds from the year the survey was administered as opposed to the calendar year when Medicare premiums were actually paid. The legacy procedure thus inflated Medicare premiums; the updated processing system corrects for this time discrepancy. Additionally, the updated processing system introduces a number of corrections to ensure that people who likely do not pay a Medicare premium are not estimated to have a Medicare premium. Some of the most important changes include (1) not calculating a Medicare premium for people who do not report a premium and have a household income below 135 percent of the federal poverty level, and

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[5] For more information on the legacy procedure for calculating Medicare premiums, see Caswell and Short (2011) at: https://www.brookings.edu/wp-content/uploads/2012/04/1107_spm_Caswell-Short.pdf

(2) only calculating a Medicare premium for people under the age of 65 if they reported having Social Security Disability Income, had Medicare, and reported a Medicare premium amount.

An additional aim of the updated processing system is to increase transparency about how Medicare premiums are estimated. Medicare premiums are now released as a separate variable, *pemcprem*, on the public use CPS ASEC and allocation flags are released giving data users information on whether Medicare premiums were reported or calculated.

Summary:

As part of the updated CPS ASEC processing system, there have been a number of improvements to imputation of out-of-pocket medical expenditures and estimation of Medicare premiums. The 2017 CPS ASEC Research File and 2018 CPS ASEC Bridge file incorporate these improvements and are available for download at: https://www.census.gov/data/datasets/time-series/demo/income-poverty/data-extracts.html.