

KFF ACA Eligibility Analysis, Technical Appendix C: Imputation of Offer of Employer-Sponsored Insurance

An integral part of determining ACA eligibility is assessing whether workers without employer-sponsored insurance (ESI) hold an offer through their workplace that they decline to take up. In most cases, an affordable offer of ESI disqualifies members of the tax filing unit of the worker from receiving subsidized coverage on the ACA Health Insurance Marketplace. The American Community Survey (ACS) does not ask about employer offers of ESI; however, the Current Population Survey Annual Social and Economic Supplement (CPS-ASEC) includes questions about whether each worker received an offer of ESI from his or her employer at the time of interview. We use the CPS-ASEC offer of ESI variable to inform a regression-based multiple imputation of whether each tax filing unit constructed in the ACS had at least one affordable offer at work.

Since the health insurance coverage variables available in the CPS-ASEC 2018 capture sources of coverage at any point during calendar year 2017 (versus at the time of survey, as with the offer rate variable), a subset of sampled individuals had a change in their employer-based coverage status across the two distinct time periods.¹ Therefore, among workers who potentially experienced a shift in offer status across the two time periods, we recoded or imputed offer rates in 2017 using the offer status in 2018. After constructing this revised offer variable for workers in CPS, we aggregated the results at the tax filing unit level to create a prediction model to apply to the ACS. Below we describe these recodes and imputation. The programming code, written using the statistical computing package R v.3.5.1, is available upon request for people interested in replicating this approach for their own analysis.

Recoding and Imputing Offer Rate Data in the CPS

As a first step in our analysis, we divided CPS-ASEC survey respondents into five distinct groups:

- (1) All individuals who did not work during 2017 and also did not hold an offer of ESI in 2018 were assumed not to have an offer in 2017.
- (2) All individuals who reported being an ESI policyholder (that is, anyone reporting having taken-up their offer of ESI) during 2017 and also reported holding an offer of ESI during early 2018 were assumed to have an offer in 2017.
- (3) All workers in 2017 who held their own ESI policies during 2017 but then reported not holding an offer during 2018 were re-coded as holding an offer of ESI in 2017.

(4) All non-workers during 2017 who reported holding an offer during 2018 were re-coded as not holding an offer of ESI in 2017.

(5) Some workers during 2017 who did not report being ESI policyholders but did report holding an offer of ESI during early 2018 were imputed to not have an offer of ESI during 2017.

For many groups, including those in groups (1) and (2) listed above, the offer status did not change across the two time periods. In contrast, we recoded offer status for people in groups (3) and (4): every non-offered worker in group (3), which includes people who held ESI policies in their own name in 2017, were considered to have an offer of ESI in 2017, and offered workers in group (4), which includes people who did not work themselves in 2017, were considered to not have their offer of ESI in 2017. Last, we implemented a probability-based random sample imputation of offers of ESI for people in group (5), described in more detail below. Only a subset of the group was re-coded from holding an offer in 2018 to not holding an offer in 2017. The number of workers selected from this population was equal to the population size of (3) subtracted by the population size of (4), thereby assuming an unchanging offer rate for the total worker population across the period.

Imputing Offer Rates for CPS Respondents with Ambiguous Offer Rate Status

The CPS-ASEC worker-level regression model was designed to be applied to a single dataset where ESI offer status is known at one point in time but not another. The code mentioned above includes programming to apply the model to the Current Population Survey (CPS-ASEC) (for years 2014 on). For the analysis underlying KFF's current estimates of ACA eligibility, we apply the regression model to workers in the 2018 CPS-ASEC.

We use the 2018 point-in-time worker offer variable provided by the US Census Bureau² to create a binomial, dependent variable that identifies a respondent as a recipient of an offer of employer-sponsored insurance at his or her workplace in early 2018. The dependent variable was constructed at the worker-level based on individuals not holding their own ESI policy at time of interview and also reporting an ESI offer or eligibility to be covered that was then voluntarily declined.

We use the following independent variables to predict offer status in 2017 among workers not covered by their own ESI during both 2017 and early 2018 but potentially holding an offer of ESI in 2017:

- Any public coverage,
- Any nongroup coverage,
- Worker earnings among all jobs,
- Full-time versus part-time status,
- Age of worker,
- Work within the construction industry.

The regression model was sub-populated to remove respondents already covered by their own ESI and also to remove non-workers. Since this imputation does not account for the affordability of the offer or whether it meets the minimum value test, we included an assumption that workers in tax filing units with a MAGI below 250% FPL do not hold affordable offers of ESI and therefore might be eligible to purchase subsidized coverage on the Exchanges.³

As mentioned above, we assume an unchanging offer rate for the total worker population across the two time periods. We determined the needed size of the population to impute by subtracting the population of (4) from the population of (3) to ensure an equivalent number of offers were gained and lost. This left only workers who reported holding an offer of ESI during early 2018, since (3) represented a larger count of workers than (4). We then calculated the probability that each worker in the dataset was offered ESI during calendar year 2017 based on our 2018 CPS-ASEC regression model. Next, we selected workers within the potential population (5) using the sampling probabilities resultant from our model.

Construction and Application of ACS Regression Model

For the analysis underlying KFF estimates of ACA eligibility, we construct a prediction model of having an offer of ESI using the 2018 CPS-ASEC and then apply this regression to tax filing units in the 2017 ACS to estimate who has an ESI offer in ACS.

We aggregate the worker offer variables constructed the 2018 CPS-ASEC as described above to create a binomial, dependent variable that identifies each tax filing unit as either holding or not holding an affordable offer of employer-sponsored insurance.

We use the following independent variables to predict offer status among tax filing units:

- Any senior citizen in the household,
- Oldest member of the tax-filing unit,
- Any member of the tax-filing unit has employer-sponsored insurance coverage,
- Any member of the tax-filing unit has nongroup coverage,
- Any uninsured individuals in the tax filing unit,
- Share of adults working full-time and part-time, and
- Highest worker earnings.

Since the imputation of documentation status (discussed in Technical Appendix B) required a multiply-imputed approach, this secondary imputation and subsequent worker sampling was only conducted once per implicate, keeping the number of ACS implicates to five.

Endnotes

¹ For example, anyone who did not work during 2017 who then held an offer of ESI in early 2018 would appear incongruous in our CPS-based eligibility model. In the other direction, workers covered by health insurance through their own employer in 2017 who lost their offer of ESI during the early months of 2018 (perhaps due to a job change) would also appear incongruous due to the discrepancy across the two time periods.

² Available at: <https://www.census.gov/data/datasets/time-series/demo/health-insurance/cps-asec-research-files.html>
For more detail about these microdata, see: J. Abramowitz, B. O'Hara. *New Estimates of Offer and Take-up of Employer-Sponsored Insurance (US Census Bureau)*, 2016. Available at: <https://www.census.gov/library/working-papers/2016/demo/Abramowitz-2016.html>.

³ For an explanation of affordability, see: Kaiser Family Foundation. *Employer Responsibility Under the Affordable Care Act*. September 2016. Available at: <http://kff.org/infographic/employer-responsibility-under-the-affordable-care-act/>