Technical Appendix:
March 2015 CPS Auxiliary Data

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OVERVIEW OF THE 2015 CPS AUXILIARY DATA

The March Annual Social and Economic Supplement to the Current Population Survey (known as the ASEC or alternatively as the March CPS) is the data source most often used for estimating health insurance coverage in the U.S. population. While the March CPS underwent major enhancements and revisions for 2014, many of these changes are still not reflected in the data released to the research community.[1] Thus, several important characteristics of employer sponsored health insurance (ESI) remain either not captured by the survey or not currently available. To address these limitations, the U.S. Department of Labor (DOL) Employee Benefits Security Administration (EBSA) annually produces an auxiliary data file which contains recoded and imputed employment and health insurance variables as well as an annual bulletin with summary tables based on the enhanced data.

As part of the process in creating the March 2015 Auxiliary Data, we have updated our data sources to reflect the newest available information. This document describes the current imputations and edits performed in order to provide estimates of employer sponsored insurance in detail for calendar year (CY) 2014.

The imputations performed can be broken down into two main categories: those dealing with access to coverage and those that describe the coverage in detail. Access to coverage includes whether an employer provides coverage as well as details about that employer, such as size (number of employees) and sector. Coverage characteristics include funding and plan type and estimates of retiree and COBRA coverage. Starting with the CY 2010 Auxiliary Data, a variable for actuarial value (which represents the average proportion of covered charges paid as benefits by insurance) has been imputed for active employees with health insurance in their own name.

In general, insurance and employment characteristics were imputed for employees as well as for other persons with employer sponsored insurance coverage in their own name. ESI dependents were given the characteristics of their primary policyholder (when that person could be found). Links for up to two policyholders were maintained for each dependent on the March CPS file so that characteristics of the secondary coverage could also be identified. One policyholder link was maintained for ESI policyholders who were also dependents. In addition, coverage through the federal and state-based marketplaces was imputed for a likely subset of those persons with individual (non-employer sponsored) health insurance, based on information reported by the Department of Health and Human Services (HHS).

As mentioned above, our starting data set was the March 2015 Annual Social and Economic Supplement to the CPS. The following lists the enhancements made and variables added for inclusion into the Auxiliary Dataset:

- Source of coverage, employer offers of coverage: While the March CPS asks whether insurance coverage is provided by an employer, it does not distinguish whether this coverage

[1] Two exceptions are (a) the release of a single point-in-time coverage variable ("Was person covered at time of questionnaire"), which can be looked at in comparison to coverage in prior year, and which we do present in this year's Health Bulletin, and (b) a clarification on type of coverage (employer-sponsored, individual private, or other) if coverage is provided from outside the household.

is from a current or former employer. The Medical Expenditure Panel Survey Household Component (MEPS-HC) provides data on whether ESI coverage was from a current or former employer and for workers, whether health insurance was offered to them by their current employer. As noted above, information on whether a person's employer offers health insurance is collected starting with the March 2014 survey, but to date this information remains unpublished. Therefore, the MEPS-HC data remains the basis of our imputations, and we use the most recent three years of data available: 2011 through 2013.

- Sector and size providing coverage: For persons with coverage from a former employer, it was necessary to impute both sector and size of the employer providing the coverage. This was done using the most recent three years of data (2012-2014) from the Medical Expenditure Panel Survey Insurance Component (MEPS-IC), as provided by the Agency for Healthcare Research and Quality (AHRQ).

- Funding status, plan type and COBRA/retiree partition: Data from the MEPS-IC from 2011 through 2014,[2] along with partitions and trends from the Kaiser/HRET Employer Health Benefits Surveys (2005 through 2014) were used to impute funding status and type of coverage for those with ESI as well as to partition coverage from a former employer into retiree and COBRA.

- Federal estimates: Data, by type of plan, from the Office of Personnel Management (OPM) on employees (postal and non-postal), and dependents and annuitants covered under the Federal Employees Health Benefits Program (FEHBP) were used to provide estimates at the Federal level.

- Actuarial values: Health plan details from the 2014 Kaiser/HRET Employer Health Benefits Survey, along with prior actuarial value analysis done for EBSA using the National Compensation Survey (2005) and historical data from prior HRET surveys were used to calculate actuarial values and impute these values onto active policyholder records. Also included is a set of actuarial values in the Auxiliary dataset that are based on the Minimum Value Calculator (MVC) from the Center for Consumer Information and Insurance Oversight (CCIIO).[3]

- Health spending: CPS variables on out-of-pocket spending and person-paid health insurance premiums were introduced beginning with the March 2011 CPS. After examination and comparison to other data sources, it was decided to include the spending variables beginning with the March 2012 Auxiliary Data and Health Insurance Coverage Bulletin.

- Union Sponsorship: Data from the March CPS itself was used to identify current workers who obtain coverage through a union plan. Data from the Survey of Income and Program

[2] At the time of our analysis, AHRQ had not published estimates of covered employees by type of plan from the 2014 MEPS-IC, as they had in prior years. According to AHRQ, there were some errors found in the data, and certain tables were being held back until corrections could be made. Data for 2014, as available on the meps.ahrq.gov website on 11/19/2015, was used for our imputations.

[3] MVC actuarial values are based on ARC automation of the CCIIO MVC Excel sheet in order to run multiple plans at once. As with last year, we have not included tabulations from them in the current Health Bulletin.

Participation (SIPP), 2008 Panel Wave 6 (2010), the most current available to us, was used to impute union sponsorship to persons with coverage from a former employer.

- Coverage through an Exchange: 2014 marked the first year of the availability of health insurance coverage for individual purchase through state or Federal exchanges, depending on the state of residence. Data from HHS, as well as the Kaiser Family Foundation, was used to impute individual exchange coverage for a likely subset of persons with non-employer sponsored private health insurance.[4] Coverage in SHOP plans for employees working for small businesses became available midway through 2014 but these plans were available only in some states. Due to low enrollment and CPS sample size, we have not imputed SHOP coverage for 2014.

These thirteen steps are described in detail below:

[4] While this information was collected in the ASEC, it has not yet been released by Census which has necessitated the imputation.

Step 1: Imputing coverage from a current versus former employer

The March CPS captures whether insurance coverage is provided by an employer, but not whether the coverage is from the policyholder's current or former employer. To impute the employer status, MEPS-HC 2011-2013 data was averaged to calculate probabilities of having coverage through a former versus a current employer. The results were enhanced with data from the 2011 through 2014 MEPS-IC,[5] which provides policyholder counts from non-Federal employers for those with active, retiree COBRA coverage. Data from the FEHBP were used to provide estimates at the Federal level.

All March CPS records were initially checked to see if current versus former employer status could be determined with certainty. That is, if a person did not work at all during a year but had ESI in their own name, then they were assigned coverage by a former employer. For all others, it was necessary to impute the source of the coverage. The 2011-2013 MEPS-HC was used to calculate probabilities of having coverage through a former employer by age, work status and presence of retiree income. These relative probabilities were adjusted in order to reproduce the target likelihood of coverage being from a former employer based on the MEPS-IC.

Valid codes for status were set as:

0 = no ESI
1 = coverage through a former employer
2 = coverage through a current employer

For CY 2014, this process resulted in 75.9 million ESI policyholders with coverage through their current employer and 11.7 million with coverage through a former employer.

The results of the imputation for source of coverage, for persons with ESI in their own names, are shown below.

Persons with ESI in Own Name
by Employment Status
(numbers in millions)

Employment Status	Number with ESI
Total	87.6
Worked in past year	**79.2**
Coverage from current employer	75.9
Coverage from former employer	3.3
Did not work in past year	**8.4**

[5] State and/or region level tables from the 2014 MEPS-IC were not available from AHRQ at the time of the analysis, but overall results from the meps.ahrq.gov website for 2014 were used and adjusted proportionally.

Step 2: Imputing whether current employer offers ESI

While the March CPS captures whether individuals are covered by ESI, the public data does not reveal if an employee is offered insurance by his or her current employer. The imputation of coverage through a current versus former employer (described in the previous step) resulted in a subset of persons who, by definition, have an employer that offered coverage.[6] For all other workers, however, it was necessary to impute whether or not their employer offers health insurance[7] and, if so, whether or not they are eligible for it.

Data from the 2011 through 2013 MEPS-HC were tabulated to calculate three year averages of offers and eligibility and projected to 2014 based on changes observed in published tabulations from the MEPS-IC. This allowed us to adjust for changes in employer offers due to the ACA. Once offer and eligibility rates were projected to 2014, we calculated the probability of working for an offering employer and being eligible for coverage based on sector (private, Federal, and state/local), firm size (<50, 50-99, 100-499, and 500+) and hours worked (< 35 vs. 35 or more per week).

Valid codes for offer status at the person level were set to:

1 = Enrolled, coverage through current employer
2 = Employer offered, eligible, not enrolled
3 = Employer offered, not eligible, not enrolled
4 = Not offered

Once this was completed, a final recode was performed such that Federal and state sector employees could not have the offer status "not offered" but were instead recoded to "offered, not eligible." These workers may have responded incorrectly by misinterpreting ineligibility for non-offering. For example, part time workers who might be ineligible for coverage may have incorrectly identified their employer as not offering coverage when they should have been coded "offered, not eligible."

The table below shows the results of the imputation, for all workers:

[6] These were workers with coverage from their current employer.
[7] An employer is considered to offer coverage if it offers coverage to any employee, even if a specific employee is not offered the coverage due to eligibility issues.

Coverage of Persons Who Worked
by Employer Offer Status
(numbers in millions)

Offer Status	Workers
Total	**160.2**
Employer offers coverage	**126.2**
Employee has coverage from employer	75.9
Employee offered (eligible), not enrolled	28.8
Employee not offered (not eligible), not enrolled	21.6
Employer does NOT offer coverage	**34.0**

Step 3: Imputing the sector that provides coverage

Given that the CPS provides information on current (March and past year) employment status, but not former employment, it was necessary to impute both sector and size of employers that provided coverage for those who have health insurance from a former employer. For those individuals who receive pension or survivor's payments as reported in the March CPS, we used the sector of the employer that provided the payments to represent the sector providing insurance coverage. For those policyholders without such payments, the sector providing coverage was imputed based on geography (state) and age of policyholder (under 55, 55-64 and 65+). We used data from the 2011 through 2013 MEPS-HC as well as the 2011 through 2014 MEPS-IC surveys and 2014 FEHBP data to determine target probabilities by these dimensions.

For dependents, the sector of the primary policyholder was used to determine the likely source of coverage. For those dependents without a link to a policyholder record, their own demographic characteristics (age, presence of survivor's income) were used to determine the sector providing coverage.

The table below shows the results of the imputation on sector, for all persons with ESI.

Coverage of all Persons with ESI
by ESI Status and Sector
(numbers in millions)

ESI Status	Sector	Number with ESI
ESI In Own Name	Total	**87.6**
	Private Sector	66.4
	Current Employer	60.9
	Former Employer	5.4
	Public Sector	21.3
	Current Employer	15.0
	Former Employer	6.3
ESI as Dependents	Total	**87.4**
	Private Sector	67.7
	Current Employer	64.2
	Former Employer	3.4
	Public Sector	19.7
	Current Employer	16.9
	Former Employer	2.9

Step 4: Imputing the size of employer that provides coverage

The March CPS provides information on current employer size. This means that for those individuals covered by a former employer, the size of the employer providing the health insurance had to be imputed. This imputation was done in a manner similar to the sector imputation.

The first step was for those with sector equal to either state or Federal government to be assigned the largest CPS size category (1,000+). Next, all other persons were assigned a size based on state, age (under 55, 55 to 64, or 65+) and sector. As with sector, data from the MEPS-IC was the primary source. If a policyholder was not found, person characteristics of the dependent were used instead. Dimensions were essentially the same as those used for the policyholder imputation, except that the age category for dependents included younger groupings.

The following table shows the results of the imputations for size of employer providing coverage.

Coverage of all Persons with ESI
by ESI Status and Employer Size
(numbers in millions)

ESI Status	Size	Number with ESI
ESI In Own Name	Total	**87.6**
	Employer Size < 100	20.3
	Current Employer	19.9
	Former Employer	0.4
	Employer Size 100+	67.4
	Current Employer	56.0
	Former Employer	11.4
ESI as Dependents	Total	**87.4**
	Employer Size < 100	19.2
	Current Employer	19.0
	Former Employer	0.2
	Employer Size 100+	68.2
	Current Employer	62.1
	Former Employer	6.1

Step 5: Imputing whether coverage was fully-insured or self-insured

The March CPS contains no information about health insurance plans held by survey respondents, including funding status: whether an employer sponsored insurance plan is fully-insured (the employer contracts with another organization to assume financial responsibility for the enrollees' medical claims and administrative costs) or self-insured (the employer assumes some or all of these costs directly). All information on plan funding for individuals with ESI has been imputed for the Bulletin as part of the Auxiliary Data.

Data on funding status, as well as plan type (HMO, POS, PPO or HDED[8]), for persons in non-Federal plans were obtained from tabulations of the 2011 through 2014 MEPS-IC files provided by AHRQ.[9] These tabulations were at the state (or geographic region) level for each year, and while there are some variations over the period, the relative values of each state versus the country as a whole are consistent. In addition to the MEPS-IC information, we also looked at the Kaiser/HRET surveys, through 2014, to determine the appropriate penetration levels of self-insurance by size of employer.

The 2014 MEPS-IC levels of self-insurance were used by sector (private vs. state/local) along with the three-year state averages to determine state specific targets for persons with ESI. All persons enrolled in Federal plans were assumed to be in fully-insured plans.

The results of the implementation for funding status are shown in the following table.

Funding Status:
Self- vs. Fully-Insured
(numbers in millions)

Funding Status	Number with ESI
Total	**175.0**
Self-Insured	98.1
Fully-Insured	76.9

[8] HMO stands for Health Maintenance Organization, PPO stands for Preferred Provider Organization, POS stands for Point-of-Service Plan, and HDED stands for high deductible health plans (which include but are not limited to IRS qualified HDHP plans).

[9] As noted previously, policyholders by plan type were unavailable from the 2014 MEPS-IC at the time of the analysis, but funding prevalence at the state level was available for 2014. Plan type was based on changes noted in the KFF/HRET survey from 2013 to 2014, and applied to our MEPS-based estimates for 2013.

Step 6: Imputing type of plan

As noted in the prior step, the March CPS does not contain information on the details of the health plan in which an individual is enrolled. As with plan funding, all details on the type of plan held by a person were imputed for those covered by ESI. Prevalence of coverage by plan type (HMO, PPO, POS, or high deductible plan (HDED)) was based on data from the 2013 MEPS-IC and the change in prevalence from 2013 to 2014 as noted in the Kaiser/HRET survey. This data was presented by funding status (self-insured vs. fully-insured) and geography.[10] Imputations were done by these dimensions as well as by size of employer.

For Federal plans, the allocation was based on actual FEHBP data from 2014, as obtained from the OPM, for employees (postal vs. other), annuitants (retirees) and dependents by plan type (HMO vs. PPO).

The table below shows the results of the imputation by funding and plan type.

Persons with ESI
by Funding Status and Type of Plan
(numbers in millions)

Funding Status	Total	HMO	PPO	POS	HDED
Total	**175.0**	**24.0**	**106.2**	**12.2**	**32.6**
In Self-Insured Plans	98.1	6.8	68.8	3.7	18.8
In Fully-Insured Plans	76.9	17.2	37.4	8.5	13.8

[10] Three years of non-published MEPS-IC data provided by AHRQ were averaged to obtain target percentages by plan type for each state. When smaller sample sizes were an issue on the MEPS-IC, three years of data by geographic region, rather than state, were used. 2013 data was adjusted using the changes observed from 2013 to 2014, in the KFF/HRET survey, in order to accurately reflect changes due to time and the ACA provisions that came into effect in 2014.

Step 7: Imputing the partition of COBRA versus retiree coverage

The March CPS does not distinguish between ESI coverage provided by a current or former employer, and it lacks information on whether coverage by a former employer is retiree coverage or COBRA. As this information has become increasingly important to DOL, the partition into retiree vs. COBRA has been imputed for the Bulletin as part of the Auxiliary Data.

Our 2014 "target" counts of persons with either COBRA or retiree coverage were obtained from AHRQ, based on the 2014 MEPS-IC, and from OPM data for the FEHBP. Partitioning persons assigned with coverage from a former employee into retiree or COBRA coverage was based on person characteristics, using the CPS data itself as well as data from the MEPS-HC.

In general, policyholders were allocated first, with their dependents allocated according to policyholder characteristics. Dependents without policyholders (usually those with coverage from outside the household) were partitioned into retiree or COBRA coverage based on their own characteristics. In our allocation, the following March CPS characteristics were used: age, presence of pension income, sector providing coverage, and categorical amount paid by employer towards coverage (all/some/none).

Age groups used were as follows: under 55, 55 to 64 and 65+. Presence of pension income is based on the March CPS variable "source of retiree income" (or survivor's income, if a dependent), with this income assumed to be pension related if the source was either company or union pension, Federal government retirement, state or local government retirement, or U.S. railroad retirement.[11] The amount paid by an employer towards coverage is captured by the March CPS and includes the following categories: all, some, or none.

Some persons were assigned to either COBRA or retiree with "certainty" (that is, person level characteristics alone determined the type of coverage held), while others were assigned based on the likelihood of coverage being either COBRA or retiree along with the desired total counts of each type of coverage.

The allocation rules and guidelines for assigning individuals to "retiree" or "COBRA" coverage are listed below, based on whether there is certainty or probability involved.

If pension income is present, status was decided with certainty as follows:

- If person has pension (or survivor's) income and coverage is from public sector, then coverage was deemed retiree.

- If person has pension (or survivor's) income and coverage is from private sector and employer payment was anything (including unknown) except "none," then coverage was deemed retiree.

[11] The revision of income questions on the March CPS has improved identification of pension income, and decreased the amount of retiree imputations necessary.

- If person is under 65, has pension (or survivor's) income, coverage from private sector, and employer payment is "none," then coverage was deemed "COBRA."

- If person is aged 65 or over, though, coverage was deemed retiree.

If no pension (or survivor's) income is present, then the partition between retiree and COBRA was determined as follows:

- The count of persons allocated to retiree or COBRA coverage based on presence of pension income was subtracted from the target counts of retiree and COBRA persons by sector and age.

- Data from the MEPS-HC and MEPS-IC were used to develop probabilities of retiree vs. COBRA coverage for this remaining group by age, employer payment and sector (for private, state and local coverage); while FEHBP data was used to determine the probability of retiree coverage for Federal covereds.

- Persons age 66 and older who had Medicare were assigned to retiree coverage; while persons aged 65 were permitted to be assigned COBRA as part of the transition to Medicare.

The table below shows the results of the COBRA and retiree assignments, for persons with coverage from a former employer (policyholders and dependents combined).

Coverage of Persons with ESI from a Former Employer

by Age, Sector and Retiree vs. COBRA

(numbers in millions)

Age	Sector	Total ESI
Under Age 55	Total	**5.2**
	Private Sector	3.4
	Retiree Coverage	0.9
	COBRA Coverage	2.5
	Public Sector	1.8
	Retiree Coverage	1.5
	COBRA Coverage	0.4
Aged 55-64	Total	**5.0**
	Private Sector	2.2
	Retiree Coverage	1.6
	COBRA Coverage	0.6
	Public Sector	2.8
	Retiree Coverage	2.8
	COBRA Coverage	0.1
Aged 65+	Total	**7.9**
	Private Sector	3.4
	Retiree Coverage	3.3
	COBRA Coverage	0.1
	Public Sector	4.5
	Retiree Coverage	4.5
	COBRA Coverage	0.0

Step 8: Editing and imputing employer size for current workers

The March CPS contains an interval variable for size of employer for longest job held during the year. While this variable refers to firm size rather than the establishment or location the employee works at, tabulations suggested that not all respondents answer appropriately. While it is not possible to infer whether responses by workers in the private sector include all employer locations when determining their employer size, we have assumed that persons working for a state or the Federal government should fall into the largest employer size category. Responses were edited accordingly.

Starting with the March 2011 CPS, Census revised the employer size categories so that there are partitions at 10, 50 and 100, whereas there had previously been partitions at 10, 25 and 100. Although we have modified our analysis to use these new size categories, it was necessary to include an additional partition at size 20 in order to determine Medicare secondary payer splits. Data from the three most current MEPS-HC files were used in order to determine the likely split for full-time and part-time workers.

Step 9: Imputing Medicare Secondary Payer (MSP)

When assigning primary coverage to individuals with more than one source of coverage during the year, the Bulletin generally ranks employer sponsored insurance (ESI) above all other sources. However, when a person has both Medicare and ESI, this is not always the case. For workers, certain employer sponsored health insurance plans are primarily responsible for payment. The Medicare Trust Funds are protected by the 1980 Congressional legislation that makes Medicare the secondary payer in specific instances, thus shifting costs away from the Medicare program.[12] Under Medicare secondary payer rules, non-workers (retirees) with ESI always have Medicare as the primary payer. For workers, the primary payer for an individual with both sources of coverage depends on the size of the employer and whether the individual qualifies for Medicare due to age or disability. Since the March CPS does not ask individuals with multiple sources of coverage which of these two types of insurance is the primary payer, this variable was imputed for persons with ESI and Medicare in accordance with Medicare secondary payer rules.

For active employees (and their dependents) a determination of primary payer depends on age and employer size. For workers or their spouses who are age 65 or over, ESI is the primary payer if the employer size is 20 or more (and Medicare is the Secondary Payer (MSP)), while for those younger than 65, ESI is the primary payer if the employer size is 100 or more (and Medicare is the Secondary Payer (MSP)). For those workers with employer size of fewer than 20 or 100 respectively, Medicare is the primary payer.

As noted in the prior step, the March CPS does not have an employer size split at 20, but rather a category for size 10 to 49; and, thus, we used partitions based on the MEPS-HC to determine probabilities for persons in this size group to be randomly assigned to employer size under 20 or size 20 or greater.[13] For dependents with coverage from both Medicare and ESI, the dependent's age is used, but the size category is obtained from the policyholder providing coverage. A variable is included in the Auxiliary Data file for all persons with both ESI and Medicare in order to indicate primary payer.

[12] CMS explanation of Medicare Secondary Payer can be found at http://www.cms.gov/Medicare/Coordination-of-Benefits-and-Recovery/Coordination-of-Benefits-and-Recovery-Overview/Medicare-Secondary-Payer/Medicare-Secondary-Payer.html.

[13] We have made this assumption only for the determination of MSP coverage.

The table below shows the results of the MSP imputation for persons with Medicare and ESI.

Medicare Secondary Payer Coverage
By Age
(numbers in millions)

Age	MSP Status	Total ESI
Age under 65	**Total**	**1.3**
	Medicare Primary	0.7
	Medicare Secondary	0.6
Ages 65 and over	**Total**	**11.2**
	Medicare Primary	8.2
	Medicare Secondary	3.0

Step 10: Imputing actuarial values (AVs)

While the March CPS includes limited data on the cost of health insurance and annual medical expenditures, it does not collect the information required to determine the "actuarial value" of an individual's health insurance plan. "Actuarial value," or AV, represents the fraction of covered medical expenses paid for by a health insurance plan, calculated as an average over a standard population. Variables which represent the actuarial value of an active employer sponsored health insurance plan have been imputed to active employees with health insurance in their own name and are included in the Auxiliary Data.

Work done by Actuarial Research Corporation (ARC) in calculating actuarial values from the 2005 National Compensation Survey (NCS) is the original basis for the actuarial value calculations in the CPS Tool. Using the NCS, ARC calculated actuarial values for the private sector plans based on the plan specifications (cost sharing and covered services) provided in the survey, and presented the distributional results by plan type, funding and employer size.

In order for the methodology and actuarial values to be relevant for plans in CY 2014, plan level detail from the 2006 through 2014 Kaiser/HRET Employer Health Benefits Surveys was used to calculate actuarial values for 2006 through and 2014, as well as to explore changes in plan details and coverage parameters over time. There are three main differences between the NCS data and the Kaiser/HRET data: (a) the Kaiser/HRET surveys show the transition over time from fee-for-service (FFS) plans and their replacement by high deductible (HDED) plans while the NCS data exists only for a single year; (b) the NCS analysis combines PPO and POS categories while they are separate categories in the Kaiser/HRET data; and (c) the Kaiser/HRET survey contains plans for both the public and private sectors, while the NCS data is private sector only. Comparing the NCS actuarial value distributions to the AVs calculated from the KFF/HRET data show that average actuarial values, as well as the prevalence of plan type and source of funding, have shifted over the time period from 2005 to 2014. The KFF/HRET shifts in AV are used, by plan type and funding, to adjust the targets for actuarial values in this year's Tool.

We have imputed both "cell based actuarial values," which are averages by sector, plan type and funding, as well as "plan-specific actuarial values" onto the Auxiliary Data. While the cell-based values are useful at the aggregate level, they are not helpful for any detailed level of analysis that may look at partitions beyond these broad cell groupings. It is for this reason that the plan-specific values, imputed using a plan to person record-by-record match prioritized by size, were also added.

The resulting plan specific average actuarial values are shown in the table below:

Average Actuarial Values for Persons with Active ESI in Own Name
by Sector and Type of Plan

Sector	Total	HMO	PPO	POS	HDED
Private Sector Plans	0.8560	0.8952	0.8612	0.8755	0.8095
Public Sector Plans	0.8805	0.9339	0.8802	0.8699	0.8128

In addition to the AVs calculated and discussed above, we have also included a set of actuarial values in the Auxiliary Data that were calculated by automating the most recent MVC from CCIIO. The MVC is a tool for large employers to evaluate a health plan's actuarial value based on its cost sharing, ensuring it complies with the ACA's minimum value requirement to cover 60 percent of total allowed costs. Due to the exploratory nature of the AVs, they are not included in the Health Bulletin at this time but are being made available in the Auxiliary Data.

As noted above, these MVC actuarial values use a version of the CCIIO Excel workbook that has been adapted in order to run large numbers of health insurance plans through in an automated manner.[14] The MVC is based on large employer data, as opposed to the individual market focus of CCIIO's Actuarial Value Calculator (AVC), and so more closely aligns with the type of plans for which actuarial values were calculated. Once calculated, each plan output was then linked back to the same set of CPS records that had the original actuarial values imputed to them, as described above. In general, our MVC actuarial values are consistent with those calculated by our internal methodology.

The resulting MVC average actuarial values are shown in the table below:

Average MVC Actuarial Values for Persons with Active ESI in Own Name
by Sector and Type of Plan

Sector	Total	HMO	PPO	POS	HDED
Private Sector Plans	0.8449	0.8884	0.8543	0.8638	0.7837
Public Sector Plans	0.8702	0.9235	0.8739	0.8743	0.7812

[14] This was necessary as the MVC allows for users to input plans one at a time in a single spreadsheet page, a process that would be unworkable for the large number of plans in the KFF/HRET survey.

Step 11: Examining CPS variables on health spending

Starting with the March 2011 CPS, Census now includes information on health insurance premiums (FHIP-VAL and PHIP-VAL) as well as out-of-pocket spending for both over the counter purchases (POTC-VAL) and medical care and equipment (PMED-VAL).

The current question on health insurance premiums,[15] is both narrowly and broadly worded, in that it mentions multiple examples of insurance types beyond traditional health insurance, but puts the question itself in the context of insurance that is not paid by the person's union or employer. Given the lack of specificity of what is contained in the answer, as well as a lack of detail of how this was asked for persons without ESI,[16] these variables are excluded from the Auxiliary Data Set and the current Health Bulletin.

Levels of out-of-pocket spending are, however, compatible with estimates from the MEPS-HC by age and insurance status. In addition, we examined the distribution of spending for those with spending and found these distributions to be robust at both the high and low ends. As a result, we included the CPS estimates of out-of-pocket spending in the March 2015 Auxiliary Data set and tables. The out-of-pocket variable included in the Auxiliary Data is the sum of the two CPS variables (over-the-counter purchases and medical care). No edits or imputations beyond this summation are performed on the CPS values. Averages for spending are shown below.

Mean Out of Pocket Spending
by hierarchical insurance

Insurance	Counts (millions)	Mean OOP
Total Population	316.2	$ 724
Insured	283.2	$ 763
ESI		
Policyholder	81.1	$ 949
Dependent	85.1	$ 654
Medicare	47.0	$ 1,158
OPHI		
Policyholder	12.2	$ 1,090
Dependent	9.9	$ 595
Other Public	47.9	$ 203
Uninsured	33.0	$ 397

[15] [Earlier I recorded that (your/name's) employer or union did not pay for (your/his/her) entire health insurance premium.] Last year, how much did (you/name) pay out-of-pocket for ALL health insurance premiums [covering (yourself/himself/herself) or others in the household]? Include both comprehensive and supplemental plans (such as vision and dental insurance). [What about (you/name)?] (Include prescription drug insurance such as Medicare Part D premiums and Medicare Advantage premiums. DO NOT include Medicare Part B premiums.)

[16] Even if we restrict the population to persons with ESI, it is still not clear that the resulting dollars are at all useful to discussions of the cost of employer sponsored coverage since the amounts may (or may not) include other types of insurance.

Step 12: Imputing whether coverage was provided through a union arrangement

For workers age 15 or older, the March CPS provides limited information on whether a person is a member of a labor union or of an employee association similar to a union (CPS person variable: A-UNMEM). For nonmembers, the March CPS asks if the person is covered by a collective bargaining agreement (CPS person variable: A-UNCOV). For simplicity, we summarize the two CPS union variables into a single variable which was coded to have values of either "1" (union) or "2" (not union). All persons who indicate either union membership or coverage through a collective bargaining agreement were considered "union." Those who respond in the negative to both questions were categorized as "not union." However, the usefulness of these questions is limited by the fact that they are asked to only one quarter of the working population (those who were in the survey during months 4 or 8) and exclude the self-employed. As a result, it was necessary to impute union membership to all other private or public sector workers and union coverage to all persons with employer sponsored insurance coverage. This was done by creating three imputed variables for union status: one for all workers (union membership), one for ESI policyholders (union coverage), and one for ESI dependents (union coverage).

We began the assignment process by looking at private and public sector workers. If the March CPS union variables give a valid union status, we assigned union membership (yes or no) with certainty. For all other persons (those without a valid CPS union status), it was necessary to impute whether or not the worker belongs to a union. Probabilities of union membership were calculated using those CPS records with a valid set of responses to the union questions. These probabilities were based on age (<35, 35-55, 55-64, 65+), collapsed industry/sector of employment (agriculture/forestry/fishing, mining, wholesale, retail, finance/insurance/real estate, services, construction, manufacturing, transportation/utilities, healthcare, government), size of employer (<50, 50-499, 500+), hours worked (<35, 35+) and geographical region.

Next we assigned with certainty union coverage status for ESI policyholders with coverage through their current employer based on their union worker status. This step was straightforward, as these records kept their assignment from the prior step.

We then imputed union coverage for those ESI policyholders with coverage from a former employer, whether or not they worked. This was to reflect the status of the employer providing coverage, while the previous union variable was based on the characteristics of the current employer. Probability cells from the 2008 Wave 6 panel of the SIPP (2010 data) are used for those with coverage through COBRA or as a retiree. Probability cells for COBRA coverage include age (<55, 55+), size of employer providing coverage (<100, 100+), sector of employer providing coverage (private, federal, state/local) and current work status (work, no work). Probability cells for retirees include an additional age break at 65 and omit work status.

For ESI dependents (including those who were also policyholders), we created a variable with the same choices as those for policyholders. We used the affiliation of the primary policyholder wherever a link was available. In the absence of a direct link, the status was imputed based on sector of coverage, size of employer providing coverage, age of dependent and whether coverage is active, COBRA or retiree.

As a result of the union assignments and imputations, workers, ESI policyholders and ESI dependents are partitioned as follows:

Union Membership or Coverage

(numbers in millions)

Population	Union Status	Total ESI
All Workers (with or without ESI, no self-employed)	**Total**	**145.0**
	Union Members	18.2
	Not Union	126.8
All Persons with ESI[17] (workers and non-workers)	**Total**	**170.1**
	Union Coverage	32.7
	Not Union	137.4

[17] This includes both policyholders and dependents, but excludes those with coverage only through self-employment.

Step 13: Imputing whether coverage was provided through a health insurance exchange

Beginning in the Fall of 2013, individuals have been able to purchase health insurance coverage for the following calendar year through either state or Federal health insurance exchanges, in addition to purchasing directly. Open enrollment sign-up for exchange coverage for CY 2014 took place between October 1, 2013 and mid-April 2014, with special enrollment permitted outside this window. In addition, small employers had the option, beginning in some states in mid-2014, to purchase coverage for their employees through the SHOP. As there was only partial implementation of SHOP coverage in CY 2014, we did not impute coverage under this program. There were several million people who purchased private insurance through the individual exchanges, and so we did impute for coverage in the individual exchange.

Our process for imputing individual exchange coverage involved looking first at policyholders, deciding if they were likely to have exchange coverage, and if so, then bringing in all dependents associated with them who had individual coverage. This was done in an attempt to keep family members together, based on the CPS variable that identifies primary policyholders for individual insurance coverage. Based on data released by HHS/ASPE, we determined that we were attempting to identify / impute for just over 8 million exchange enrollees, and we used the HHS distribution of exchange enrollees by state, by age group, and the overall percent likely to be subsidized (85%)[18] as of April 2014 as the basis of the imputation.

Of the 46.2 million persons on the March 2015 CPS with individual private health insurance, we found 15.9 million to be potential individual exchange enrollees. The process of culling included looking at policyholders and excluding (a) those who either had ESI in own name, or an offer of ESI, and (b) those who had Medicare, Medicaid or CHIP coverage. While initial probabilities were based on enrollment by state, adjustments to these probabilities were then made based on the distribution of enrollees by age. Given limitations in CPS data on income and the high reported number of exchange enrollees receiving subsidies, we focused our imputations on those policyholders who were under 400% FPL, based on CPS AGI.

Below is the distribution of persons in the exchange, by age group, compared to the data released by HHS/ASPE. It should be noted that the demographics of the CPS appear to include a large number of persons with family coverage for OPHI who are at or under 400% of poverty, and as a result it was necessary to adjust our algorithms to take more persons with either single or spouse only coverage in order to get close to the age distribution as reported by HHS/ASPE.

[18] "Health Insurance Marketplace: Summary Enrollment Report for the Initial Annual Open Enrollment Period," May 1, 2014 (accessed at https://aspe.hhs.gov/sites/default/files/pdf/76876/ib_2014Apr_enrollment.pdf).

Distribution of Persons with Exchange Coverage by Age Group

Imputed vs. Targets

Age Group	Target %	Imputed %
Under 18	6%	9%
18 to 25	11%	15%
26 to 34	17%	16%
35 to 44	17%	13%
45 to 54	23%	19%
55 to 64	25%	26%
65+	1%	1%

USEFUL LINKS:

Current Population Survey's Annual Social and Economic Supplement (ASEC, or March CPS):

- The main CPS Page is found here: https://www.census.gov/programs-surveys/cps.html/ with links to details such as methodology, data, definitions and technical documentation.
    - The codebook for the March 2015 CPS, which includes mention of survey changes is found at: http://www2.census.gov/programs-surveys/cps/techdocs/cpsmar15.pdf.
- Health insurance estimates from the CPS are from the Annual Social and Economic Supplement, with the main publication page for health insurance reports found here: https://www.census.gov/hhes/www/hlthins/publications/reports.html.
    - The main report from the March 2015 survey, "Health Insurance Coverage in the United States: 2014", contains information collected in both the Current Population Survey Annual Social and Economic Supplement (CPS ASEC) and the American Community Survey (ACS). For the most part, tables in the report are from the CPS. State-level tables, however, are from the ACS, which has a larger sample size and can give better estimates by smaller geographic areas.
        - The report itself can be found at: https://www.census.gov/content/dam/Census/library/publications/2015/demo/p60-253.pdf.
    - Working papers on health insurance can be found at https://www.census.gov/hhes/www/hlthins/publications/working.html.
    - Further explanation of the changes and enhancements to the March 2014 CPS can be found in: http://www.census.gov/hhes/www/hlthins/publications/sehsd_wp_2014-16.pdf.
    - Point-in-time insurance coverage variable information, and information on refinements to coverage from outside the household, can be found at: http://www.census.gov/hhes/www/hlthins/data/incpovhlth/2013/current-coverage.html.

Medical Expenditure Panel Survey (MEPS):

- The main MEPS page is found here: http://meps.ahrq.gov/mepsweb/ with background information here: http://meps.ahrq.gov/mepsweb/about_meps/survey_back.jsp.
- Two of the main components are the Household Component (MEPS-IC) and Insurance Component (MEPS-IC). Links to those are found at: http://meps.ahrq.gov/mepsweb/survey_comp/household.jsp for the HC and http://meps.ahrq.gov/mepsweb/survey_comp/Insurance.jsp for the IC.

Survey of Income and Program Participation (SIPP):

- The Survey of Income and Program Participation, a longitudinal panel survey, is conducted by the Census bureau. Information on the SIPP can be found here: https://www.census.gov/programs-surveys/sipp/about.html.
- Reports based on SIPP data can be found here: https://www.census.gov/programs-surveys/sipp/publications/p70s.html.

Kaiser/HRET Employer Health Benefits Surveys:

- Archive of surveys from 2014 and earlier can be found at: http://kff.org/health-costs/report/employer-health-benefits-annual-survey-archives/ .
- The 2014 Survey, with data used for this report, can be found at: http://kff.org/health-costs/report/2014-employer-health-benefits-survey/.
- The current survey page: http://kff.org/health-costs/report/2015-employer-health-benefits-survey/.

Federal Employees Health Benefits Program (FEHBP)

- An overview of the program can be found at: http://www.opm.gov/healthcare-insurance/healthcare/.
- Frequently asked questions, including about Medicare and the FEHBP are at: http://www.opm.gov/FAQS/topic/insure/index.aspx?cid=3d961dac-81d1-44e2-998c-ed80029feb70.

National Compensation Survey:

- The NCS home page is at: http://www.bls.gov/ncs/.
- The report "Employee Benefits in the United States" can be found at: http://www.bls.gov/news.release/ebs2.toc.htm.
- An ASPE Research Brief on "Actuarial Value and Employer-Sponsored Insurance", which mentions the NCS actuarial values is found at: http://aspe.hhs.gov/health/reports/2011/av-esi/rb.shtml.

Minimum Value Calculator (MVC) from the Center for Consumer Information and Oversight:

- Standards Related to Essential Health Benefits, Actuarial Value, and Accreditation is found at: http://www.gpo.gov/fdsys/pkg/FR-2013-02-25/pdf/2013-04084.pdf.
- The Minimum Value Calculator with links to methodology and the Excel sheet is found at: http://www.cms.gov/CCIIO/Resources/Regulations-and-Guidance/.

REVISIONS TO THE MARCH CPS AND OUR METHODOLOGY:

Beginning with the March 2014 CPS, Census introduced substantial revisions to the survey, particularly in the areas of income and insurance. The health insurance questions were completely redesigned in order to better estimate coverage during the prior calendar year. In particular, the source of insurance from outside the household has been clarified. New questions were added to look at coverage through health insurance exchanges, subsidies through the exchanges, as well as questions on employer offers of health insurance and insurance take-up rates. While the revised questions have been recoded into the prior years' format and thus present us with an improved picture of the levels of coverage during the year, most of the data containing the newly added questions have not yet been released and so we continue to impute for those items not yet available. As a result, our method to produce the CPS Auxiliary Data has not differed substantially from prior years' efforts. As with last year, a single "yes/no" point-in-time insurance variable, for coverage at time of survey questionnaire, was released by Census and has been included without edit in the Auxiliary Data. Tables examining this variable are included in the current Health Bulletin.

New fields that have been added to the Auxiliary Data this year are OUTTYP (coverage from outside the household), OLDSTATE (the state variable that had been variable GESTCEN (1960 Census State Code), now recoded from the variable GESTFIPS (state FIPS code)), EXCHANGE (a flag with imputed exchange coverage), and MCDEXPANSION (a state level flag to denote if the record was from a state with a Medicaid expansion program in CY 2014).

In terms of methodology, last year's March CPS based model remains the basis for the current Auxiliary Data, with the March 2013 Auxiliary Data once again as the main starting point for this year's analysis. Revisions to the March 2013 Auxiliary Data included the use of the Survey of Income and Program Participation (SIPP), Wave 6 of the 2008 Panel (2010 data) as a data source for imputing union coverage for those with COBRA or retiree coverage.

In addition, we have continued to refine the calculation of the actuarial value of health insurance plans for active policyholders. The March 2011 Auxiliary Data was the first to make use of the actuarial value variable, and several revisions to the calculation resulted in values for the current version that are not directly comparable to those from last year. The revisions included updated plan data (moving to the 2014 KFF/HRET Survey), updated private insurance benchmark of underlying expenses (based on updated CMS projections), revisions to the program used to calculate the actuarial values, and updates to the data underlying the calculations themselves. This year we included an actuarial value in the Auxiliary Data that is based on an automated version of the Minimum Value Calculator provided by CCIIO.[19]

[19] The MVC was chosen last year over the CCIIO AVC since the MVC is based on large employers' claims data, as opposed to data from the individual and small group markets, which lines up more closely with its use in this project.