# Design Issues for a Longitudinal Employer Health Insurance Survey to Facilitate Analysis of Policy Changes[1]

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**Abstract**

The Medical Expenditure Panel Survey (MEPS) Insurance Component (IC) is an annual survey of employers that produces national and state-level estimates of employer-sponsored insurance (including offered plans, costs, and number of enrollees). A longitudinal extension was implemented to this survey for three iterations (2013-14, 2014-15 and 2015-16) to measure detailed health insurance transition estimates of U.S. businesses, with the first iteration starting just before implementation of the Patient Protection and Affordable Care Act in 2014. This paper describes the varying policy and methodological issues considered in developing the final design for each of the three surveys. Among these considerations were the impacts of the gradual phasing in of particular changes in law as well as survey budget constraints. Transitional insurance offer estimates made possible by the longitudinal design will be presented.

Key Words: longitudinal survey, survey design, health insurance, business survey

## 1. Introduction

The Patient Protection and Affordable Care Act (ACA), effective January 1, 2014, was designed in part to help small employers (those with 50 or fewer employees) provide cost-effective health insurance to their employees. The legislation stipulates that all firms with 50 or fewer full-time equivalent (FTE) employees may purchase health insurance for their employees from health insurance marketplaces known as the Small Business Health Options Program (SHOP). As an incentive to offer qualified insurance, some small employers qualify for a tax credit. Employees of small firms where health insurance is not offered are eligible to purchase subsidized insurance for themselves and their families from marketplaces set up for individual purchasers. In addition, all firms with more than 50 FTE employees are required to offer qualified insurance to their employees or pay a penalty if any employees enrolled in subsidized marketplace coverage. The scope of covered employers and the magnitude of penalties changes over time.

There are two types of health insurance marketplaces, also known as exchanges, offered by States to employers and individuals in those States: State-Based Marketplaces (SBM) and the Federally Facilitated Marketplace (FFM). SBMs allow employers to use an exchange developed by their State for health insurance eligibility and enrollment. The FFM allows employers to use the Federal website, www.HealthCare.gov, for health insurance eligibility and enrollment. Prior to implementation of the ACA, States were given the opportunity to decide whether to offer a SBM or the FFM to employers. In 2014 when the ACA was implemented, 18 States chose to develop a SBM while 33 States, including the District of Columbia, chose the FFM.

The Medical Expenditure Panel Survey – Insurance Component (MEPS-IC) is an annual survey of private employers as well as state and local governments. The survey produces national, state and MSA-level estimates of employer-sponsored insurance including offered plans, costs, and number of enrollees. The MEPS-IC is sponsored by the Agency for Healthcare Research and Quality and is fielded by the U.S. Census Bureau. The private-sector sample is comprised of about 42,000 business establishments annually. An establishment is a single business entity or location. Firms, also known as companies, can comprise one or more establishments.

To enable research to compare the health insurance characteristics (e.g., offers, premiums, and deductibles) of establishments eligible to use exchanges before and after the implementation of the ACA, an initial longitudinal supplement of private-sector establishments was implemented in the MEPS-IC in 2014. That is, in 2014, the MEPS-IC longitudinal survey sampled 3,000 establishments in firms with 50 or fewer employees that responded to the 2013

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MEPS-IC and fielded these longitudinal cases along with the regular 2014 MEPS-IC survey. The longitudinal survey produced valuable research data exhibiting the health insurance changes these businesses may have experienced after the implementation of the ACA.

Additional longitudinal surveys were fielded in 2015 and 2016. Both of these surveys incorporated expansions designed to broaden the survey and enable analyses of additional provisions of the ACA. The 2015 survey sampled 5,000 establishments that responded to the 2014 MEPS-IC in firms with 100 or fewer employees. The 2016 survey sampled 7,000 establishments that responded to the 2015 MEPS-IC in firms with any number of employees. This paper describes the designs of these MEPS-IC longitudinal surveys and provides an example of the type of conditional estimate that cannot be obtained by an annual, cross-sectional survey.

## 2. Medical Expenditure Panel Survey Insurance Component (MEPS-IC)

The MEPS-IC is an annual establishment survey that was first fielded in 1996. The survey produces cross-sectional estimates of health insurance offerings and characteristics from samples of approximately 42,000 private-sector business establishments and about 3,000 state and local governments. Estimates are produced at the national, State, and MSA-levels. Table 1 illustrates some of the key national estimates produced by the MEPS-IC for three recent years.

**Table 1 – Key private-sector health insurance estimates for the United States, 2013-2016**

| | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|
| **Percentage of establishments offering health insurance** | 49.9% (0.46%) | 47.5% (0.35%) | 45.7% (0.35%) | 45.3% (0.41%) |
| **Percentage of employees enrolled at establishments offering health insurance** | 58.2% (0.27%) | 57.8% (0.38%) | 57.0% (0.39%) | 56.0% (0.39%) |
| **Average total single premium per enrolled employee** | $5,571 ($22.7) | $5,832 ($25.4) | $5,963 ($26.4) | $6,101 ($27.0) |

( ) = standard error

Source: Medical Expenditure Panel Survey Insurance Component, Agency for Healthcare Research and Quality

## 3. MEPS-IC Longitudinal Surveys

Most Americans obtain their health insurance coverage through their own or a family member's employment. Some analysts have argued that recent changes in the availability of non-group coverage and expansions of Medicaid resulting from the implementation of the ACA have the potential to affect employers' behavior with respect to providing health insurance coverage to their employees. Although cross-sectional data can be informative in analyses of change, to directly examine how these changes in policy affect existing relationships longitudinal data are needed. In response to the need for longitudinal data on the employer-sponsored health insurance market, the Office of the Assistant Secretary for Planning and Evaluation (ASPE) and the Agency for Healthcare Research and Quality (AHRQ) collaborated to sponsor three independent 2-year studies. The design characteristics were similar for the first two longitudinal surveys but by the third survey (ie. 2015-2016) a redesign was necessary to incorporate changes caused by the gradual implementation of the ACA provisions over time affecting larger employers, broader analytic objectives, and lessons learned from fielding the first two surveys. Table 2 shows a summary of the design changes for the three longitudinal surveys (Kashihara, 2013; Kashihara, 2014; Kashihara, 2016).

This paper primarily describes the first and third survey designs since the second survey design was very similar to the initial design. The longitudinal surveys are two-year studies where the frame for Year 2 is the respondents to the prior year full MEPS-IC. The limited two-year length was due to funding constraints and respondent burden. Due to

the length and the content of the survey the MEPS-IC can be especially burdensome to small establishments so the number of survey contacts is carefully managed. Sampled establishments in the longitudinal survey were given the same survey instruments and used the same data collection activities as the regular MEPS-IC. During data processing, the longitudinal cases were treated separately for imputation and weighting.

**Table 2 – Sample design changes for the MEPS-IC longitudinal surveys**

| Survey | Firm Size (Employees) | Sample Size (Establishments) | Strata |
|---|---|---|---|
| **2013 – 2014** | ≤ 50 | 3,000 | Firm Size<br>State Marketplace Type |
| **2014 – 2015** | ≤ 100 | 5,000 | Firm Size<br>State Marketplace Type |
| **2015 – 2016** | All Firm Sizes | 7,000 | Firm Size<br>Medicaid Expansion State<br>Offer Insurance |

## 4. 2013-2014 MEPS-IC Longitudinal Survey

As mentioned above, the purpose of the initial longitudinal survey was to measure change in health insurance characteristics and offerings by businesses before and after implementation of the ACA. Only private-sector establishments with 50 or fewer employees (full and part time) that responded to the 2013 MEPS-IC were eligible. The sample size of 3,000 establishments was set based on cost and survey processing constraints and the survey was fielded along with the regular 2014 MEPS-IC using the same data collection processes (Kashihara and Baskin, 2016).

### 4.1 *Stratification*

The 2013-2014 longitudinal sample design was based on two stratification variables: *firm size* (2 levels: 1-11 employees and 12-50 employees) and *State marketplace type* (2 levels: SBM and FFM) (Kashihara, 2013). The firm size strata were set to mirror those used in the full 2013 MEPS-IC to minimize variance implications. State marketplace type was used because it is an important study variable with respect to the ACA. The unweighted and weighted counts of 2013 MEPS-IC establishments in the sampling frame for the 2014 longitudinal MEPS-IC are shown in Table 3. This frame contained a total of 16,300 private-sector establishments with 50 of fewer employees that responded to the 2013 MEPS-IC, representing 5.3 million establishments in the U.S.

**Table 3 – Establishment counts in the MEPS-IC sample frame by State marketplace type and firm size**

| | Unweighted | | Weighted | |
|---|---|---|---|---|
| **Marketplace Type** | **1 – 11 Employees** | **12 – 50 Employees** | **1 – 11 Employees** | **12 – 50 Employees** |
| **SBM** | 4,195 | 1,793 | 1,717,287 | 337,655 |
| **FFM** | 7,193 | 3,119 | 2,652,158 | 572,545 |

### 4.2 *Allocation of Establishments*

During the design phase the 2013 MEPS-IC data collection was not yet completed, so 2012 MEPS-IC data were used to design the allocation. Separate Neyman allocations were initially used to determine the optimal number of establishments to select in each stratum based on two key variables: *offer insurance* and *number of enrolled employees* (Baskin and Kashihara, 2014). Table 4 shows the Neyman allocation of establishments using each of these variables, as well as the final number which was determined using a composite (weighted average) of the two Neyman estimates in each cell as follows:

[*.44 x offer insurance*] + [.56 x *number of enrolled employees*]

The weighting factors used for these variables (.44 and .56) were consistent with those used for the full MEPS-IC design (Davis, 2015).

**Table 4 – Allocation of 3,000 sample establishments by compositing two Neyman allocations**

| | Neyman allocation using | | |
|---|---|---|---|
| **Stratum** | **Offer insurance** | **# enrolled employees** | **Composite** |
| **Firm size 1 – 11 employees** | | | |
| **FFM** | 1,480 | 821 | 1,111 |
| **SBM** | 982 | 856 | 911 |
| **Firm size 12 – 50 employees** | | | |
| **FFM** | 346 | 835 | 620 |
| **SBM** | 192 | 488 | 358 |
| **Total** | 3,000 | 3,000 | 3,000 |

Prior to selecting the longitudinal sample, establishments on the frame within these stratum cells were sorted by *state*, *industry*, *firm size*, and *firm ID* to ensure a diverse sample with respect to these characteristics. The sampling method was the same as that used to select the sample for the full MEPS-IC: sequential probability proportional to size (sequential PPS). The probability of selection, $p_i$, for an establishment was

$$p_i = \left(\frac{nrwgt_i}{\sum_i nrwgt_i}\right) x\ (stratum\ sample\ size)$$

where $nrwgt_i$ is the prior-year non-response adjusted weight for the establishment, which was used because the final 2013 MEPS-IC weights were not available at the time of sampling (Kashihara and Baskin, 2013).

4.3 *Final Response Outcomes*

Table 5 shows the final response outcomes for the 2013-2014 longitudinal survey. Of the sampled 3,000 establishments, 2,924 were in-scope for the survey in 2014. There was only one establishment that was undeliverable-as-addressed (UAA) and many of the out-of-scope establishments had gone out of business (about 2.5% overall). The data were collected via a telephone prescreener followed by a mailed survey form or web response option, then a telephone follow-up if necessary. Most of the prescreener-only establishments did not offer insurance and these establishments were not sent any further survey forms. The in-scope response rate was 75.6 percent.

Table 6 shows an example of the types of estimates that can be developed using longitudinal data. For example, an estimated 14.5 percent of establishments that did not offer family coverage to their employees in 2013 did offer such coverage in 2014. These types of conditional estimates would not be possible without a longitudinal survey component.

**Table 5 – Final response outcomes for establishments in the 2013-2014 MEPS-IC longitudinal survey**

| | |
|---|---|
| **Sample** | 3,000 |
| UAA / Out-of-Scope | 76 |
| **Total in scope** | 2,924 |
| Prescreener Response | 980 |
| Mail Response | 669 |
| Web Response | 214 |
| Telephone Follow-up Response | 348 |
| **Total response** | 2,211 |

**Table 6 – Changes in the offering of family coverage by U.S. establishments in firms with less than or equal to 50 employees, 2013 – 2014**

| | Any family coverage offered in 2014 | | |
|---|---|---|---|
| | **No** | **Yes** | **Total** |
| **Any family coverage offered in 2013** | | | |
| **No** | 85.5% (1.93%) | 14.5% (1.93%) | 100.0% |
| **Yes** | 28.3% (2.90%) | 71.7% (2.90%) | 100.0% |

( ) = standard error

Source: Medical Expenditure Panel Survey Longitudinal Insurance Component Survey, Agency for Healthcare Research and Quality

The MEPS-IC longitudinal data are collected by the U.S. Census Bureau and, for confidentiality reasons, may only be accessed at a Federal Statistical Research Data Center (**www.census.gov/about/adrm/fsrdc/locations.html)** .

4.4 *Analytic Weight Components*

The base weight for the 2014 longitudinal weight was the non-response adjusted weight from the 2013 MEPS-IC. This weight was then adjusted for the probability of selection in the longitudinal sample. A non-response raking adjustment was applied using the following dimensions: *firm size x region, State marketplace type,* and *industry*. Poststratification was then performed using *region x firm size x State marketplace type x industry*. The sum of the weights was approximately 5.3 million, which represents the number of establishments in the United States that are in-scope for the MEPS-IC survey and are in firms with 50 or fewer employees.

## 5. 2015-2016 MEPS-IC Longitudinal Survey

The third MEPS-IC longitudinal survey was redesigned to incorporate changes caused by the gradual implementation of the ACA, new analyses goals, and lessons learned from fielding the first two surveys. In 2016, some States expanded SHOP eligibility to include firms with 100 or fewer FTE employees. To enable research and to monitor the impact of the ACA on all firms, the 2015-2016 longitudinal survey sampled 7,000 establishments of all firm sizes that responded to the 2015 MEPS-IC (Kashihara, 2016). These establishments were fielded along with the full 2016 MEPS-IC.

5.1 *Strata*

Establishments on this frame were stratified by three variables: *firm size* (3 levels), whether the establishment *offered insurance* in 2015, and *Medicaid Expansion State* (MES). The offer insurance variable was added as a survey stratum to enhance the power of estimating change in the percentage of establishments offering insurance. The MES variable is based on whether or not a state implemented a Medicaid expansion plan at any time prior to 2016 (Kashihara, 2016). This variable replaced the marketplace type variable used for the 2013-2014 longitudinal IC iteration.

5.2 *Allocation of Establishments*

The total sample was initially allocated to broad upper-level strata and then the sample was selected by further allocating the finer strata using Neyman allocation within each broad stratum. The variables used for the upper-level stratification were: *firm size* (1-50, 51-100, 101+ employees), *offered insurance or not*, and the *Medicaid expansion/non-expansion status of States*. Although three broad firm size strata are used for the upper-level allocation, six finer level firm size strata were used (1-12, 13-50, 51-87, 88-100, 101-722, and more than 722 employees) for sampling allocation. Table 7 shows how the 7,000 longitudinal establishments were allocated among the upper-level stratum cells (2 *MES* x 3 *firm size* x 2 *offered insurance*). This allocation was determined based on the approach described above using Neyman allocation in conjunction with the following general goals and considerations (Chowdhury, 2016):

- Larger samples of establishments in firms that offer insurance to improve sample sizes for estimates of items such as premiums and deductibles,
- 100% sample of the 51-100 employee size group due to their small quantity in the frame, and
- Similar sample sizes for both MES groups.

**Table 7 – 2015-2016 IC longitudinal survey establishment sample allocation**

| | **Medicaid not expanded in State** | | **Medicaid expanded in State** | | |
|---|---|---|---|---|---|
| **Firm Size** | **Firm offered Insurance** | **Firm not offered insurance** | **Firm offered Insurance** | **Firm not offered insurance** | **Total** |
| **1 – 50 employees** | 1,322 | 312 | 1,322 | 312 | 3,268 |
| **51 – 100 employees** | 399 | 93 | 646 | 127 | 1,265 |
| **101 + employees** | 1,189 | 31 | 1,206 | 41 | 2,467 |
| **Total** | 2,910 | 436 | 3,174 | 480 | 7,000 |

The results from the 2015-2016 longitudinal survey were made available in the fall of 2017. These data provided a first glimpse of changes in health insurance coverage and costs for larger businesses and also continued to track changes for smaller businesses as they adjusted to the realities of a new market. Table 8 shows changes of insurance offerings during the three longitudinal surveys for establishments in firms with 1-50 employees.

## 6. Discussion

Three iterations of the MEPS longitudinal IC survey have been fielded to collect data that can be used for analyses of year-to-year changes and the potential impact of the ACA on insurance offers by employers, the number of enrollees in health insurance, and levels of premiums, copays/coinsurance, and deductibles. These types of estimates are not possible with an annual cross-sectional survey such as the regular MEPS-IC. The series of longitudinal surveys also allows for incremental analyses as the ACA was phased in and modified. The three independent longitudinal surveys required extensive redesign efforts to keep pace with the evolving health care law and the changing importance of key underlying design variables such as State Marketplace Type and Medicaid Expansion State Status. Survey budget also played a role with respect to survey sample sizes. The efforts produced data that provided unique opportunities to study changes such as those found by Vistnes, et. al. (2017), who noted that the net decline from 2014 to 2015 (34.8 to 33.3 percent) in the percentage of establishments in firms with 50 or fewer employees offering hospital and medical

coverage was a function of 5.5 percent adding and 14.6 percent dropping coverage. While there are no current plans or funding for future IC longitudinal surveys, investigation has begun on developing methods to integrate a routine longitudinal component into the full MEPS-IC.

**Table 8 – Percentages of insurance offer status between years for establishments in firms with 1-50 employees for the MEPS-IC longitudinal surveys: 2013-2014, 2014-2015, 2015-2016**

| 2013 – 2014 | Offered in 2014 | Did Not Offer in 2014 |
|---|---|---|
| **Offered in 2013** | 33.8% (1.03%) | 3.1% (0.41%) |
| **Did Not Offer in 2013** | 6.0% (0.54%) | 57.2 (1.09%) |

| 2014 – 2015 | Offered in 2015 | Did Not Offer in 2015 |
|---|---|---|
| **Offered in 2014** | 31.3% (0.95%) | 3.2% (0.39%) |
| **Did Not Offer in 2014** | 4.2% (0.42%) | 61.3 (1.01%) |

| 2015 – 2016 | Offered in 2016 | Did Not Offer in 2016 |
|---|---|---|
| **Offered in 2015** | 29.7% (0.39%) | 6.4% (1.08%) |
| **Did Not Offer in 2015** | 5.0% (0.37%) | 68.6 (0.91%) |

( ) = standard error

Source: Medical Expenditure Panel Survey Longitudinal Insurance Component Surveys. Agency for Healthcare Research and Quality.

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