

**SUPPORTING STATEMENT FOR  
Survey of Respirator Use and Practices**

**OMB CONTROL NO. 1220-0171**

**B. COLLECTIONS OF INFORMATION EMPLOYING STATISTICAL METHODS**

**1. Describe (including a numerical estimate) the potential respondent universe and any sampling or other respondent selection methods to be used. Data on the number of entities (e.g., establishments, State and local government units, households, or persons) in the universe covered by the collection and in the corresponding sample are to be provided in tabular form for the universe as a whole and for each of the strata in the proposed sample. Indicate expected response rates for the collection as a whole. If the collection had been conducted previously, include the actual response rate achieved during the last collection.**

Universe

The Survey of Respirator Use and Practices (SRUP) sample frame is the list of the private industry establishments that provided a usable response to the Survey of Occupational Injuries and Illnesses (SOII) in the United States. The SOII sample is estimated to represent 7.9 million private establishments in the 50 states and District of Columbia.

Sample size

The total number of responses required for all study goals and for all domains is approximately 90,000 completed surveys. The response rate varies across industries. Nonresponse in this survey can occur for multiple reasons, such as an establishment is currently out-of-business, refuses to participate, or we are unable to make contact. In anticipation of nonresponse, we adjust the sample size within each industry to accommodate nonresponse patterns. The final sample size is approximately 140,000.

Sample selection

The overall sample design is a two-stage stratified random sample, where the first stage involves the selection from the frame of establishments that provided a usable response for the SOII. Establishments will be selected using a simple random sampling method within strata of North American Industry Classification System (NAICS) industry and employment size class. For each establishment selected, data collection will include respirator use for the entire establishment (*i.e.*, across all occupations).

The second stage of sampling is to select one specific occupation with respirator use within a selected establishment via simple random sampling. For those establishments with confirmed respirator use, one specific occupation from a list of occupations confirmed at the establishment will be randomly selected for occupation-level data collection. Limiting the specific occupations to only one per establishment reduces the response burden by decreasing the response time and

increases the probability that a respondent will complete the entire questionnaire.

Information on personal protective equipment (PPE) and respirator use from the Occupational Requirements Survey (ORS) and the Occupational Information Network (O\*NET) will be used to help allocate the sample size for sampling strata, so that more sample units are allocated in the sampling strata with higher rates of PPE or respirator use and, likewise, fewer sample units are allocated in the sampling strata with lower rates of PPE or respirator use. Thus, the sampling design optimizes resources by targeting the sample on those occupations at potential risk for airborne hazardous contaminant exposures.

Improving upon the sampling methodology that was used in the 2001 respirator survey, this survey will 1) identify industries that have a higher prevalence of PPE and respirator use using other data sources, 2) oversample industries where respirator use is more common, and 3) collect occupation-level data to understand respirator use and practices in different occupations across industries.

#### Response rate

A response rate at a minimum of 64 percent is anticipated. This will be achieved through timely follow-up contact email, two follow-up mailings, and telephone contacts to establishments that do not respond. The SOII response rate has decreased 11.5 percentage points from 2001 to 2019. Given this is a voluntary survey, we anticipate a similar decline in the response rate for this survey from the last time the survey was collected in 2001.

#### Previous collection response rate

The 2001 Survey of Respirator Use and Practices response rate was 75.5%.

## **2. Describe the procedures for the collection of information including:**

- **Statistical methodology for stratification and sample selection,**
- **Estimation procedure,**
- **Degree of accuracy needed for the purpose described in the justification,**
- **Unusual problems requiring specialized sampling procedures, and**
- **Any use of periodic (less frequent than annual) data collection cycles to reduce burden.**

#### Sample Selection

The survey is fully based on probability survey design theory and methodology. This methodology provides:

A statistical foundation for drawing inference to the full universe being studied.

A basis for estimating a required sample size to satisfy survey reliability requirements.

### Sample Procedure

The principal feature of the sample design is its use of stratified random sampling. The characteristics used to stratify units are the industry and employment size class. As mentioned before, a probability sample is selected from each strata.

The survey will be conducted by an online survey questionnaire completed through the BLS Internet Data Collection Facility.

### Estimation Procedure

The survey's estimates of the population total are based on the Horvitz-Thompson estimator, which is an unbiased estimator. For example, to calculate the total number of employees, the following formula would be used:

$$\hat{C}_t = \sum_{e \in T_t} W_e Y_e$$

Where:

$\hat{C}_t$  = Estimated total number of employees in industry,  $t$

$T_t$  = Set of establishments in industry,  $t$

$W_e$  = Final estimation weight

$Y_e$  = Number of employees at establishment,  $e$

The final estimation weight ( $W_e$ ) is the product of the inverse of the probability of selection ( $\pi_e^{-1}$ ), a non-response adjustment factor for non-responding units, and benchmark factor to adjust employment to the employment levels of the survey reference year.

To calculate the total proportion of establishments with an attribute of interest, the following formula would be used:

$$\hat{P}_t = \frac{1}{N_t} \sum_{e \in T_t} W_e A_e$$

Where:

$\hat{P}_t$  = Estimated total proportion of establishments in industry  $t$  with attribute of interest

$N_t$  = Population number of establishments in industry,  $t$

$T_t$  = Set of establishments in industry,  $t$

$W_e$  = Final estimation weight

$A_e = 1$ , when establishment  $e$  has attribute of interest;  $0$ , otherwise

The final estimation weight ( $W_e$ ) is the product of the inverse of the probability of selection ( $\pi_e^{-1}$ ), a non-response adjustment factor for non-responding units, and benchmark factor to adjust employment to the employment levels of the survey reference year.

### Required Accuracy

The sample size is set to ensure that any proportion estimate based on the entire universe studied will have an estimated sampling error no greater than plus or minus 5 percent at the 95 percent confidence level.

**3. Describe methods to maximize response rates and to deal with issues of non-response. The accuracy and reliability of information collected must be shown to be adequate for intended uses. For collections based on sampling, a special justification must be provided for any collection that will not yield "reliable" data that can be generalized to the universe studied.**

A response rate at a minimum of 64 percent is anticipated. Follow-up contact via email, mail, and telephone to non-respondents are techniques that will be used to help maximize survey response:

The estimator is adjusted to account for non-respondents by adjusting the weights of the respondent data using a weighting cell adjustment technique.

It is expected that the survey will yield reliable estimates, which can be generalized to the universe studied.

**4. Describe any tests of procedures or methods to be undertaken. Testing is encouraged as an effective means of refining collections of information to minimize burden and improve utility. Tests must be approved if they call for answers to identical questions from 10 or more respondents. A proposed test or set of test may be submitted for approval separately or in combination with the main collection of information.**

The Survey of Respirator Use and Practices will be an important source of information on the use of respirators in the workplace and the impact the coronavirus pandemic had on respirator use. Because of the variety in the usage of respirators across industries and occupations, background scoping and testing of the proposed questions was conducted to ensure that respondents could understand the questions and that they would be able to provide the desired information. To accomplish this, two phases of testing were conducted: scoping interviews to collect insight into potential areas of difficulty; and two rounds of cognitive testing to iteratively test changes and ensure respondent understanding.

Scoping interviews were conducted with health and safety experts (four in total) who specialize in respirator usage and design and with potential survey respondents (three in total). The goal of the scoping interviews was to determine where focus and emphasis should be placed for the

cognitive testing phase. Participants discussed respirator usage in general and provided feedback on draft versions of the survey questions. These interviews provided important insight for revisions to the initial survey questions and for the cognitive interview protocol.

The second testing phase included two rounds of cognitive interviews. The first round was conducted with 18 potential survey respondents. This round resulted in changes to the survey questions to address issues resulting from confusion, burden, or difficulty in accessing or reporting requested detail. These changes were reviewed and approved by NIOSH and tested in a second round with 20 potential survey respondents. The findings from the second round of cognitive testing validated changes or led to revisions that were finalized into the final survey instrument.

**5. Provide the name and telephone number of individuals consulted on statistical aspects of the design and the name of the agency unit, contractor(s), grantee(s), or other person(s) who will actually collect and/or analyze person(s) who will actually collect and/or analyze the information for the agency.**

The Division Chief of Statistical Methods Group, Xingyou Zhang, is responsible for the sample design which includes selection and estimation. His email is [zhang.xingyou@bls.gov](mailto:zhang.xingyou@bls.gov) and phone number 202-691-6082. The sample design of the survey conforms to professional statistical standards and to OMB Standards and Guidelines for Statistical Surveys.