

Survey of MSD Prevention Tools/Methods: 10-year Follow-Up

Request for Office of Management and Budget (OMB) Review and Approval  
for a Federally Sponsored Data Collection

Section B

Brian D. Lowe, Ph.D.  
Research Industrial Engineer  
Project Officer  
blowe@cdc.gov

National Institute for Occupational Safety and Health  
Division of Applied Research and Technology  
4676 Columbia Parkway, Mail Stop C-24  
Cincinnati, Ohio 45226

513-533-8161 (phone)  
513-533-8596 (fax)

August, 2016

**Table of Contents**

Section Title	Page Number
B. COLLECTION OF INFORMATION EMPLOYING STATISTICAL METHODS....	3
B1. Respondent Universe and Sampling Methods.....	3
B2. Procedures for the Collection of Information.....	3
B3. Methods to Maximize Response Rates and Deal with No Response.....	7
B4. Tests of Procedures or Methods to be Undertaken.....	7
B5. Individuals Consulted on Statistical Aspects and/or Analyzing Data.....	8
LITERATURE CITED.....	8

## **B. COLLECTION OF INFORMATION EMPLOYING STATISTICAL METHODS**

### **B1. Respondent Universe and Sampling Methods**

The target population will consist of respondents who meet the very specific eligibility criteria defined by holding certification in the practice of professional ergonomics. Primarily participation will be sought from the U.S. Board of Certification of Professional Ergonomists ([www.bcpe.org](http://www.bcpe.org)), from whom the investigators have obtained commitment from the Executive Director. Additional participation will be invited internationally from other certifying organizations that have been endorsed by the International Ergonomics Association (IEA). We also plan to include certificants of the Canadian College for the Certification of Professional Ergonomists whose certification requirements are consistent with those of the U.S. BCPE. We have identified approximately 1,170 total potential eligible respondents who hold professional certifications in the field of Ergonomics in the U.S., the United Kingdom, Australian, New Zealand, and Canada. We will only administer the survey in English, and have limited the survey administration to English-speaking nations. We do not anticipate English language to be problematic for participants in these nations. We have e-mail contact information for all of these individuals described above. We have assumed an optimistic 80% response rate to anticipate up to 938 participants. This number was used in the burden hour calculation.

### **B2. Procedures for the Collection of Information**

The project team will contact all eligible respondents through an initial e-mail with a description of the survey and its purpose. This initial e-mail will be signed by the lead project investigator for the purpose of giving eligible respondents advanced notice of a second e-mail correspondence that will contain the web link for survey completion. The e-mail contact distribution list of eligible respondents have been obtained from directories of certificants on the certifying organizations' websites and through the U.S. Board of Certification in Professional Ergonomics (BCPE). As a courtesy, we will give prior notification to all of these certifying organizations of our intent to solicit participation from their certificant holder members. BCPE has already endorsed this effort.

A priori sample size (power) calculations are unnecessary the population of eligible respondents will be invited to participate. Surveying the entire universe of eligible respondents is preferable to using a sample for multiple reasons: (1) The project will contrast international respondents to those in the U.S. and the universe of respondents is

smaller in non-U.S./Canadian countries; (2) Full inclusivity reflects a professional courtesy in which all eligible participants' professional practices are considered; (3) Collection from a sample rather than the entire universe will not significantly reduce cost of the ICR to the Federal Government.

The study is a single observation cross-sectional survey administration. Independent variables will include basic demographics, such as respondents' country of residence, years' experience and certification in the ergonomics profession, current occupation, expertise/specialization, highest academic degree attained, and field of study will be the only independent variables. Results are intended to be presented primarily as descriptive statistics. The analysis will be based minimally on inferences drawn between independent variables and response outcomes. Dependent variables (outcomes) will include proportions of respondents using tools and methods that have been developed for application in the practice of ergonomics. Ratings of frequency of use of the various tools and methods will also be queried as dependent variables.

Analysis of the original survey, 10 years ago, consisted of descriptive statistics, primarily percentages responding affirmatively for use of each method or tool and frequency of use for each method or tool. This analysis will be repeated for the present survey administration. For those tools and methods repeated from the original survey Chi-squared tests on the proportions (proportion reporting affirmative use) will be conducted to determine if changes in the proportions are statistically different between the 2005 and present follow-up survey. For the various methods and tools we will also explore a conversion of the reported frequency of use categories (*once per year, once every 6 months, once every 3 months, once a month, more than once a week*) to ordinally scaled categories suitable for a more powerful non-parametric test, such as Wilcoxon-Mann-Whitney (Siegel and Castellan, 1988). This analysis would test for changes in *frequency of use* of the particular tool or method among the U.S. CPEs from pre-2005 to present. This would be more informative than simple changes in affirmative use.

A possible study limitation is the potential for a response bias, in which the professionals who respond to the survey invitation are systematically different in some way from the population of professionals on the whole. We do not anticipate such a bias.

### B3. Methods to Maximize Response Rates and Deal with Nonresponse

Dempsey et al (2005) reported a 53% response rate using a paper questionnaire that was sent to respondents and returned via postal mail. This follow-up will administer the survey electronically, using a web-based survey platform. This will be a more convenient way for eligible participants to complete the questionnaire and to electronically submit responses. As such we anticipate a response rate beyond 53%.

We will invite the eligible universe of certified ergonomists to participate. There is no ability to invite alternate respondents in cases of non-response. Participation is also voluntary. If response rates are significantly less than 80% we will have the ability to examine geographic bias in response (country and state, within the U.S.).

### B4. Tests of Procedures or Methods to be Undertaken

The project team updated the original data collection instrument used by Dempsey et al (2005) using a number of steps. First an informal review was conducted of practitioner-oriented conference programs of ergonomics societies (e.g. National Ergonomics Conference & ErgoExpo, Applied Ergonomics Conference, etc), society newsletters, and keyword search frequencies in ergonomics databases. This was done for the purpose of identifying emerging issues that are associated with newer relevant methods and/or tools, such as physical activity tracking devices.

The decision was made to include more open-ended questionnaire items on what the team identified as emerging issues, related to the use of mobile device “apps” that were not represented in the 2005 survey. Following this step we obtained input from the NIOSH Musculoskeletal Disorders Cross Sector Program on the updated set of tools/methods and the resulting revision of the original survey questionnaire. Additionally, a small group of eight Certified Professional Ergonomists were convened at the Applied Ergonomics Conference in March, 2016 to participate in focus group-type discussion to provide feedback on the appropriateness of new items in the questionnaire, the structure of the question items, and the web-based questionnaire design (a new aspect of the survey). We also obtained input by e-mail from ergonomics professionals in the U.K. and Canada. Inclusion of the international group addressed potential issues of country/cultural bias in the methods and tools included in the survey.

## B5. Individuals Consulted on Statistical Aspects and/or Analyzing Data

NIOSH personnel will primarily design the data collection, perform the data collection, and analyze the data. Secondary support staff (to be determined) may also aid NIOSH in these data management tasks and with statistical analysis and summary. Below is a summary of individual NIOSH staff roles on this project.

Name	Job Title	Division	Contact Information	Roles on Project
Brian Lowe, Ph.D.	Research Industrial Engineer	DART	<a href="mailto:blowe@cdc.gov">blowe@cdc.gov</a> 513.533.8161	Project Officer, Designed data collection, will collect data, and analyze data
Patrick Dempsey, Ph.D.	Team Leader	OMSHR	<a href="mailto:pdempsey@cdc.gov">pdempsey@cdc.gov</a> 412.386.6480	Co-Investigator, Designed data collection, will collect data, and analyze data
Evan Jones	Electronics Engineer	DART	<a href="mailto:ej1@cdc.gov">ej1@cdc.gov</a> 513.533.8187	Technical and data management support, will collect data, and analyze data

## Literature Cited

Dempsey, P.G., McGorry, R.W., and Maynard, W.S. (2005). A survey of tools and methods used by certified professional ergonomists. *Applied Ergonomics*, 36, 489-503.

Siegel, S. and Castellan, N.J. (1988). *Nonparametric statistics for the behavioral sciences*. New York: McGraw Hill.