

Applying the CDC Science Impact Framework to the results of the National Institute for Occupational Safety and Health and the Bureau of Labor Statistics 2001 Survey of Respirator Use and Practices

Supplemental A.

- (1) The survey questionnaires were mailed by BLS to the selected 40,002 establishments during August 2001 and the response rate was 75.5%.
- (2) A total of 27 publications were identified during the interviews. Those 27 studies were recorded and written in a document by the initial research team.
- (3) Both coders hold Ph.D. with extensive research experience. One coder holds Ph.D. in social science with experience in qualitative methods including interviews and content analysis. The other holds Ph.D. in statistics with many years of experience on quantitative and qualitative data analysis.
- (4) When discrepancies, the two coders discussed the rationale of their own decision. The main discussion evolved around the difference between “creating awareness” and “catalyzing action.” The criteria we used are:
 - NIOSH/BLS-pushed publications with main focus on disseminating the results of the survey belong to Disseminating Science (they include disseminating overall results such as two major publications and industry-specific SRUP results dissemination)
 - Some NIOSH-authors’ works are categorized as Catalyzing Action when their research was motivated by the original NIOSH publications on the 2001 SRUP—e.g., research on respirator fit (many papers were published on this research subject) was motivated by the 2001 SRUP
 - Non-NIOSH/BLS-pushed publications belong to Creating Awareness when they simply cite the initial publications to support statements on facts or their arguments
 - Among non-NIOSH authors publications, those with evidence that the 2001 SRUP influenced/contributed/initiated/motivated their research belong to Catalyzing ActionThere was no case the coders couldn’t reach to a consensus after discussion.
- (5) There are records indicating that NIOSH presented survey findings at 10 conferences until 2005. We found hard evidence on the following occasions: American Occupational Health Conference, 2003; PPT stakeholder meeting, 2008; American Industrial Hygiene Conference & Exposition, 2003, 2005, 2006, 2007; National Academy of Science meeting, 2005 (I assume there were more NAS meetings); and Surveillance meeting, 2004
- (6) Based on thorough review of all contents, reviewers determined that the large majority of citations used information about the survey as evidence of burden and need for respiratory protection awareness and included them as evidence that awareness was created. Given the substantial number of publications involved in that category it’s not possible in a single manuscript to show and discuss each one. Rather, the reviewers took the approach of providing counts they found in each category and examples for the SIF categories. These were provided in the reference section – references with (b) for Creating Awareness and (c) for Catalyzing Action.
- (7) ARTBA, 7 focus groups, 2001-2003; and NDA, 8 focus groups, 2004
- (8) Possible reasons being that employers were unfamiliar with the OSHA regulatory requirements or did not apply appropriate resources needed to meet the regulatory requirements (Doney et al., 2005)
- (9) The three data sources are the National Agricultural Workers Survey (NAWS), the Sentinel Event Notification System for Occupational Risk (SENSOR)-Pesticides database, and the California Department of Pesticide Regulation (DPR) Pesticide Illness Surveillance Program (PISP).
- (10) In 2009, a NIOSH-wide decision was made to transition intramural research in the Agriculture, Forestry and Fishing Sector to the NIOSH extramural Agriculture Centers; therefore, further PPE research and surveillance in the Agriculture Sector was not pursued.

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- (11) Examples include Kim et al. (2013, 2015a, 2015b) and Roberge et al. (2012a, 2012b, 2013, 2014).
- (12) Examples include Bergman et al. (2014, 2015), Coffey (2006), Rengasamy & Eimer (2011), Zhuang & Bradtmiller (2005), and Zhuang et al. (2005, 2010, 2011, 2016).
- (13) OSHA regulation specifies that respirator air-line couplings must be incompatible with outlets for other gas systems to prevent inadvertent servicing of air-line respirators with non-respirable gases or oxygen. If an inert gas (e.g., helium, argon, nitrogen) is inadvertently supplied to an air-line respirator rather than breathable air, the results can be fatal.
(<https://www.osha.gov/dts/shib/shib042704.pdf>)
- (14) Deaths Involving the Inadvertent Connection of Air-line Respirators to Inert Gas Supplies. See <https://www.osha.gov/dts/shib/shib042704.html>
- (15) In 2006, OSHA used the results of the survey to inform the revised Respiratory Protection Standard (29 CFR 1910.134) (<https://www.osha.gov/laws-regs/federalregister/2006-08-24>).
- (16) "ASTM International accepted the challenge, and requested that NIOSH, as leaders in conducting personal protective equipment research for the nation, chair the committee. This approach to standards development is consistent with the National Technology Transfer and Advancement Act of 1995, which directs federal agencies to use consensus standards to address policy objectives and activities where practical" (National Technology and Advancement Act of 1995;
- (17) For examples, references with (b) Creating Awareness, were published during 2004-2020; and references with (c) Catalyzing Action, were published during 2005-2018.