

REFERENCES

1. Vandenbroucke JP, Brickley EB, Vandenbroucke-Grauls CMJE, Pearce N. A test-negative design with additional population controls can be used to rapidly study causes of the SARS-CoV-2 epidemic. *Epidemiology*. 2020;31:836–843.
2. Pearce N, Moirano G, Maule M, et al. Does death from Covid-19 arise from a multi-step process? *Eur J Epidemiol*. 2021;36:1–9.
3. Ciocanea-Teodorescu I, Nason M, Sjolander A, Gabriel EE. Adjustment for disease severity in the test-negative study design. *Am J Epidemiol*. 2021;190:1882–1889.
4. Whitcomb BW, Naimi AI. Defining, quantifying, and interpreting “noncollapsibility” in epidemiologic studies of measures of “effect”. *Am J Epidemiol*. 2021;190:697–700.

Crosswalks to Convert US Census Bureau Industry and Occupation Codes, 1980–2018

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention. Where authors are identified as personnel of the International Agency for Research on Cancer/World Health Organization, the authors alone are responsible for the views expressed in this article and they do not necessarily represent the decisions, policy or views of the International Agency for Research on Cancer / World Health Organization.

The data used for this project are publicly available (please see the eAppendix, p. 12, for a detailed list of data sources). The crosswalks are publicly available on a GitHub repository (<https://github.com/johnbeard/Crosswalks-for-industry-and-occupation-codes>).

The authors report no funding and conflicts of interest.

SDC Supplemental digital content is available through direct URL citations in the HTML and PDF versions of this article (www.epidem.com).

Correspondence: John D. Beard, Department of Public Health, College of Life Sciences, Brigham Young University, 4103 Life Sciences Building, Provo, UT 84602. E-mail: john_beard@byu.edu.

Copyright © 2021 Wolters Kluwer Health, Inc. All rights reserved.

ISSN: 1044-3983/22/332-e8

DOI: 10.1097/EDE.0000000000001440

To the Editor:

Occupation is reflective of workers' socioeconomic status (SES) and occupational exposures and experiences.¹ Therefore, occupation has been used as a measure of SES, much like education and income, or to derive occupation-based indices of SES in many epidemiologic studies.¹ Moreover, industry and occupation can be used to generate hypotheses regarding occupational exposures and experiences associated with particular health outcomes, identify groups of workers with high burdens of particular health outcomes, and target programs, interventions, and policies to workers in industries and occupations with high disease burdens to reduce occupational illness and injury.¹ Industry and occupation information can be used to link epidemiologic studies and datasets to other datasets, such as job exposure matrices, to assign quantitative or semiquantitative estimates of occupational exposures.² Industry and occupation (and occupation-based SES) can be considered a(n) exposure,³ potential confounder,⁴ effect measure modifier,⁵ or mediator⁶ depending on the research question of interest.

Industry and occupation information is often ascertained via free text fields for epidemiologic studies or datasets used for epidemiologic research (e.g., birth and death certificates),³ which necessitates the assignment of industry and occupation codes to the data to enable epidemiologic analyses. The US Census Bureau has developed industry and occupation codes and made them publicly available for decades.⁷ Furthermore, web-based tools developed and made publicly available by the National Institute for Occupational Safety and Health can be used to assign US Census Bureau industry and occupation codes to free text fields.⁸

The US Census Bureau frequently updates their codes for industry (every 5 years) and occupation (every 8–10 years), which are used for the decennial census and surveys including the American Community Survey, Current Population Survey, and Survey of Income

and Program Participation.⁷ Updates are necessary because industries and occupations emerge, change, and become more or less common over time.⁷ Therefore, it is important to provide researchers and professionals with crosswalks that can be used to convert older (e.g., 1980) industry and occupation codes to newer (e.g., 2018) codes. A study of usual (i.e., longest held) occupation reported on death certificates in relation to mortality from amyotrophic lateral sclerosis and Parkinson's disease provides a recent example of the utility of such crosswalks.³

The US Census Bureau makes publicly available their updated industry and occupation codes and instructions for using them (eAppendix, p. 6; <http://links.lww.com/EDE/B874>). However, they do not compile this information into files or formats that can be conveniently used for epidemiologic analyses. Therefore, we have used US Census Bureau information and followed US Census Bureau instructions to create crosswalks to convert industry codes from 1980 to 1990, 1990 to 2000, 2000 to 2002, 2002 to 2007, 2007 to 2012, and 2012 to 2017 codes. We have also created crosswalks to convert occupation codes from 1980 to 1990, 1990 to 2000, 2000 to 2002, 2002 to 2010, and 2010 to 2018 codes. Our crosswalks include industry and occupation codes for the general population of workers, military personnel, and nonpaid workers. Our crosswalks can be used to convert older industry and occupation codes to newer codes (e.g., from 1980 to 1990), but they cannot be used to convert newer industry and occupation codes to older codes (e.g., from 1990 to 1980). We are making available our crosswalks, an explanation of conversion factors, instructions for using the crosswalks, our rationale for providing two versions of each crosswalk, and notes about and descriptions of our sources (eAppendix; <http://links.lww.com/EDE/B874>). We hope our crosswalks will enable updated analyses of industry and occupation data within the broad spectrum of epidemiologic studies in which industry and occupation data are used.

John D. Beard**Marco A. Verdeja****Dick A. Bonsrah****Susan D. Westfall**

Department of Public Health

College of Life Sciences

Brigham Young University

Provo, UT

Andrea L. Steege

Division of Field Studies and Engineering

National Institute for Occupational Safety

and Health

Cincinnati, OH

Mary K. Schubauer-Berigan

International Agency for Research on

Cancer

Lyon, France

REFERENCES

1. MacDonald LA, Cohen A, Baron S, Burchfiel CM. Occupation as socioeconomic status or environmental exposure? A survey of practice among population-based cardiovascular studies in the United States. *Am J Epidemiol*. 2009;169:1411–1421.
2. Cifuentes M, Boyer J, Lombardi DA, Punnett L. Use of O*NET as a job exposure matrix: a literature review. *Am J Ind Med*. 2010;53:898–914.
3. Beard JD, Steege AL, Ju J, Lu J, Luckhaupt SE, Schubauer-Berigan MK. Mortality from amyotrophic lateral sclerosis and Parkinson's disease among different occupation groups—United States, 1985–2011. *MMWR Morb Mortal Wkly Rep*. 2017;66:718–722.
4. Richardson DB, Cardis E, Daniels RD, et al. Risk of cancer from occupational exposure to ionising radiation: retrospective cohort study of workers in France, the United Kingdom, and the United States (INWORKS). *BMJ*. 2015;351:h5359.
5. Yang J, Ou CQ, Ding Y, Zhou YX, Chen PY. Daily temperature and mortality: a study of distributed lag non-linear effect and effect modification in Guangzhou. *Environ Health*. 2012;11:63.
6. Townsend T, Mehta NK. Pathways to educational disparities in disability incidence: The contributions of excess body mass index, smoking, and manual labor involvement. *J Gerontol B Psychol Sci Soc Sci*. 2021;76:766–777.
7. Beckhusen JB. *Recent Changes in the Census Industry and Occupation Classification Systems. American Community Survey. Technical Paper 78*. Washington, DC: United States of America Census Bureau; 2020. <https://www.census.gov/library/publications/2020/demo/acs-tp78.html>. Accessed 22 June 2021.
8. National Institute for Occupational Safety and Health. *NIOSH Industry and Occupation Computerized Coding System (NIOCCS)*. Available at: <https://csams.cdc.gov/nioccs/Default.aspx>. Accessed 22 June 2021.