

New Data Available! Assess Causes of Death by Industry and Occupation

February 16, 2022 by Andrea L. Steege, PhD, MPH; Amy Mobley, MEn; Rachael Billock, PhD, MSPH; Hannah Free, MPH; and Marie Haring Sweeney, PhD

Linking Causes of Death to Work

Since the early years of National Institute for Occupational Safety and Health (NIOSH), mortality data have been an important source of information to assess links between cause of death and work. In the 1980s, the National Occupational Mortality Surveillance (NOMS) program was born out of a collaboration between NIOSH, the National Center for Health Statistics (NCHS), and the National Cancer Institute (NCI). The NOMS program uses information from death certificates to evaluate patterns in causes of death by occupation and industry. Combining industry and occupation with other death certificate data, allows for the (1) identification of potential new risks, (2) confirmation that previously identified associations still exist, and (3) suggestion of studies or interventions to prevent identified risks.

Over the years, at least 87 peer-reviewed manuscripts based on NOMS data have been published in 22 journals. Some of the outcomes studied are:

- Cancer (lung, breast, reproductive, bladder, brain, etc.)
- Drug overdose
- Silicosis
- Human Immunodeficiency Virus (HIV) and Hepatitis B Virus (HBV)
- Renal disease
- Suicide
- Amyotrophic Lateral Sclerosis and Parkinson's Disease

NIOSH, along with others, have studied these and other outcomes in many occupations and industries, including but not limited to: milling, mining, manufacturing, shipbuilding, construction, dry cleaning, farmers, physicians, dentists, and law enforcement. These publications can be found on the [NOMS Publications Website](#).

Challenges Along the Way

Collecting and coding industry and occupation narratives from death certificates have been major obstacles to updating the NOMS program in the past. Recent technological innovations have made it possible to update NOMS.

- First, NCHS has been working with jurisdictions (states and two cities) to adopt Electronic Death Registration Systems so that death certificate data are collected digitally, which is much faster than the less automated collection processes of the past.
- Second, NIOSH developed the NIOSH Industry and Occupation Computerized Coding System (NIOCCS) to quickly and accurately code free text industry and occupation narratives to standardized codes.

Making Improvements and Sharing the Data

Over the past 5 years, the NOMS program was updated in the following four ways.

1. The program was expanded to include more states to make NOMS nationally representative.

NIOSH, in collaboration with NCHS, has formed a successful partnership with jurisdictions within the National Vital Statistics System (50 states; 2 cities: New York City and Washington DC; and 5 territories). Forty-six states and New York City participated in 2020, and 49 states and New York City participated in 2021.

2. The lag time was decreased between when deaths occur, and when data are available.

Usual industry and occupation narrative information collected by funeral directors (i.e., occupation: first grade teacher, firefighter; industry: computer manufacturing, restaurant) are now transferred to NCHS then directly to NIOSH each week to translate the narratives to Census 2012 codes using NIOCCS and other quality control steps. The codes are returned to the jurisdictions approximately 8-12 weeks later for their immediate use. Approximately 12 months after the calendar year ends, NCHS makes the Mortality Multiple Cause-of-Death file including industry and occupation codes available to the public.

3. The data were made available to more researchers.

Starting with 2020 data, industry and occupation variables are included in the [Mortality Multiple Cause-of-Death](#) file with [documentation](#) of the new fields. Four new variables are included: two variables with individual census codes for industry and occupation and two variables with aggregated categories of industry and occupation codes (adopted from the National Health Interview Survey simple recodes). Usual industry and occupation were coded for those decedents age 15 and older. For those unfamiliar with these data, the [Mortality Multiple Cause-of-Death](#) file includes a record for each death that occurs in the United States which is recorded in the jurisdictions' Electronic Death Registration System (EDRS). The EDRS contains standard fields based on the [2003 US Standard Certificate of Death](#). Data fields include:

Get the data!
Visit the [Vital Statistics Online Data Portal](#) to access the [Mortality Multiple Cause-of-Death data](#)

- Underlying Cause of Death (coded to the International Classification of Disease-10th revision, ICD-10),
- Up to 20 contributing causes of death (also coded to ICD-10),
- Race, ethnicity, sex, age, and other demographic and medical information.

Public use data does not include any geographic identifiers, such as state or city of death. Files that contain geographical variables are available as research files [upon request](#).

4. Efforts were made to improve industry and occupation data quality.

Data quality has two components: (1) the industry and occupation data collected by funeral directors from contacts of the decedents, and (2) the coding of the industry and occupation narratives received.

Efforts continue to work on both components to improve the industry and occupation data available:

- To help improve data collected by funeral directors, NIOSH updated the booklet, [Guidelines for Reporting Occupation and Industry on Death Certificates](#), which provides guidance for completing the industry and occupation fields on death certificates. Additionally, in December 2021 NIOSH launched a [website for funeral directors](#) that highlights the important role they have in obtaining information researchers need to examine whether a person's job could be related to their cause of death. Both the booklet and the website are available in Spanish. Data Quality Reports are another tool that jurisdictions may use to improve industry and occupation narratives that are collected. NIOSH sends tailored reports to each jurisdiction's Vital Records office to convey the quality of their data compared to data from other jurisdictions.
- To improve the industry and occupation data coding, NIOSH has three levels of quality control that take place after the NIOCCS program performs the initial coding. These are completed by coding experts who receive ongoing training and feedback. In addition, the NIOCCS program itself is updated periodically based on new data processed and reviewed.

Next steps

Over the next year, NIOSH will be working to update the NOMS website to include tools to make it easier to analyze the data. This includes plans to include NOMS data in [NIOSH's Worker Health Charts](#), a data visualization tool that allows users to create their own charts to assess current rates, distribution, and trends in workplace injuries, illnesses, and deaths. Additionally, NIOSH will collaborate further with NCHS to make the data available through other channels.

We are interested in hearing from you! What tools would you like NIOSH to develop to help you use the data? How might these data be used to inform policy or develop interventions? What outcomes or populations would be best studied with these data? Please leave your thoughts in the comments below.

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