FINAL PROGRESS REPORT

September 30, 2021

Expansion of the New Hampshire Occupational Health Surveillance Program

Fundamental Program - Grant #U60 OH010910 - 06
Final Report of Major Outputs and Outcomes
(July 1, 2020 to June 31, 2021)

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List of Terms and Abbreviations

ABLES	**Adult Blood Lead Epidemiology Surveillance**
ACS	**American Community Survey**
ASTHO	**Association of State and Territorial Health Officials**
BLS	**Bureau of Labor Statistics**
BRFSS	**Behavioral Risk Factor Surveillance System**
CDC	**Centers for Disease Control and Prevention**
CSTE	**Council of State and Territorial Epidemiologists**
ED	**Emergency Department**
EPHT	**Environmental Public Health Program**
HAI	**Healthcare Associated Infections Program**
HD	**Hospital Discharge Data**
ICD	**International Classification of Diseases**
NAACCR	**North American Association of Central Cancer Registries**
NAICS	**North American Industry Classification System**
NH DHHS	**New Hampshire Department of Health and Human Services**
NH OHSP	**New Hampshire Occupational Health Surveillance Program**
NHSCR	**NH State Cancer Registry**
NIOCCS	**NIOSH Industry & Occupation Computerized Coding System**
NIOSH	**National Institute for Occupational Safety & Health**
OHI	**Occupational Health Indicators**
OHS	**Occupational Health Surveillance**
OSHA	**Occupational Safety and Health Administration**
PPE	**Personal Protective Equipment**
PRAMS	**Pregnancy Risk Assessment Monitoring System**
RFW	**Recovery Friendly Workplace**
SOC	**Standard Occupational Classification**
WIC	**Supplemental Nutrition Program for Women, Infants, and Children**

Abstract

The New Hampshire Occupational Health Surveillance Program (NH OHSP) moved to the University of New Hampshire in September of 2015, just as the new grant cycle was underway. This move has facilitated the ability to receive academic/institutional supports in conducting research and surveillance activities on worker safety and health issues.

The NH OHSP has met its goals of establishing a fundamental state-based occupational health surveillance program and has been successful in tackling a variety of priority occupational safety and health topics. The primary goal of the 2015-2021 program is to enhance state-based capacity for occupational health surveillance in New Hampshire, with a focus on integrating occupational health into mainstream public health through emphasis on intervention and prevention. Specific Aims include: Assess the extent and severity of workplace injuries, illnesses, deaths, hazards and/or exposures; Identify workers and occupations at greatest risk through data collection of industry, occupation, and work status; Develop research and prevention (program) policies through partnerships with public health and non-public health organizations; and Expand outreach and dissemination.

The specific aims and objectives of the NH OHSP are framed around the key components of a state-based surveillance program, addressing multiple critical areas of workplace safety and health, disability, and worker well-being. They are intended to identify surveillance trends, emerging issues and diseases, high-risk occupations, industries, and worker populations, promote the integration of occupational safety and health into broader public health goals and objectives (such as infectious and chronic disease), and develop workplace interventions with links to policy initiatives that may impact worker health and safety in New Hampshire.

The process of generating indicators increases the consistency and availability of occupational disease and injury surveillance data at the state and national levels. The process of establishing access or linkages to data sources, including the use or development of tools, applications, or processes increase the availability, accessibility, and timeliness of data. OHIs are measures of health (work-related disease or injury) or factors associated with health (workplace exposures, hazards, or interventions) that allow a state to compare its health or risk status with that of other states and evaluate trends over time. This enhances the usefulness of the indicators in policy development, service planning, and evaluation. Work-related injuries and illnesses can be prevented. Successful approaches to making workplaces safer and healthier begin with having the data necessary to understand the problem. Stakeholders who need and will be able to use the results of OHI analysis include, occupational safety and health professionals, NH Department of Health and Human Services, Program Coordinators, the NH Department of Labor, disability service providers, professional and labor organizations in various industries, businesses and trade associations, unions, and legislators and policy makers.

Our efforts to date have led to meaningful impacts on occupational safety and health surveillance, epidemiology, public health practice and research activities (both national and state-wide). We developed strong relationships with our NIOSH partners, with our public health partners at NH DHHS, and with agencies that allowed us to access data that was previously untapped for occupational health surveillance (for example, the commercial motor vehicle crash data). We developed audience-specific educational materials, outreach, and other resources for optimizing their application among our partners for protecting workers. We informed legislative efforts on topics tied to worker safety and health and well-being. Major impacts for program period 2015-2021 are highlighted in this report.

Section 1

The primary aim of this project was to expand state-based capacity for occupational health surveillance in New Hampshire, with a focus on integrating occupational health into mainstream public health through emphasis on intervention and prevention. Key findings during this reporting period for the core aims established in the original proposal are highlighted below.

- *Aim 1) Assess the extent and severity of workplace injuries, illnesses, deaths, hazards, and/or exposures*
- *Aim 2) Identify workers and occupations at greatest risk through data collection of industry, occupation and work status*
- *Aim 3) Develop research and prevention (program) policies through partnerships with public health and non-public health organizations*.

Significant or Key Findings:

- ✓ Occupational Health Indicators: New Hampshire workers are more likely to be working 40 hours or more per week – increasing from 61.8% to 66.8%. Correspondingly, they are less likely to be working less than 40 hours per week (dropping from 33.8% of those employed to 29.5% in 2018); Workers age 65+ make up a larger proportion of the workforce, increasing from 3.9% of all workers to 7.7%; From 2000 to 2018 there were 264 work-related fatalities in New Hampshire, with 20 occurring in 2018; There were over 1,735 work-related hospitalizations for persons age 16 years and older, where the expected payer is workers' compensation (2012 to 2018); In 2018, one in twenty New Hampshire workers were employed in industries at high risk for morbidity. One in seven are employed in high-risk occupations for morbidity.
- ✓ Added industry and occupation questions to the Behavioral Risk Factor Surveillance System (BRFSS) survey for another year, for a total of 8 years of data.
- ✓ Adult lead levels for NH adults from 2014-2016. Years 2014 and 2015 follow earlier trends with between 80 and 90% of cases represented by lower BLL results (10-24 µg/dL) and only 1-2% at 40 or above. 2016 saw an increase in the percentage shared by higher results, with over 20% of cases above 25 µg/dL and 4% of cases at 40 or above. The top three most common industries were Manufacturing (34%), Construction (32%), and Waste Management and Remediation (19%).
- ✓ NH Asthma Prevalence among New Hampshire Workers, Behavioral Risk Factor Surveillance System, 2013-2017. The top occucpation with the highlest prevalence of asthma is Healthcare Support (14.2%). 14.8% of workers were told by a doctor or other healthcare professional that their asthma was work related (2014-2016).
- ✓ 2019 ANNUAL DISABILITY STATISTICS COMPENDIUM (Rehabilitation Research and Training Center on Disability Statistics and Demographics A NIDILRR-Funded Center) Added industry and occupation variables. Approximately 3,800, or 8% of people with disabilities in New Hampshire are employed in the education services industry. Approximately 4,800, or 10.1% of people with disabilities in New Hampshire are employed in the manufacturing industry. 9.0% of people with disabiltiies are employed in office and administartive support occupations, compared to 11.2% of people without disabilties.12.4% of people with disabilities are employed in transportation and material moving occupations, compared to 5.4% of people without disabilities.
- ✓ Exploration of breastfeeding barriers associated with returning to work among women enrolled in the NH Special Supplemental Nutrition Program for Women, Infants and Children. Women in every industry group reported they would have continued breastfeeding longer if it was easier to pump at work, with Health Care (39%), Manufacturing (58%), and Social Assistance Services (56%) being the top three industry groups represented. The greatest decline in the percentage of infants breastfed occurred in the Accommodation and Food Services (82.9% to 49.9%) and Retail/Wholesale Trade (84.2% to 46%) industry categories.
- ✓ Developed on-line training module for collecting industry and occupation ("*Collecting Industry and Occupation Data: A Training Guide")* for poison center staff managing occupational health poisoning calls. Provided training on the NIOSH Staying Safe at Work Curriculum for teaching workers with intellectual and

developmental disabilities about health and safety on the job to several NH disability service providers and job coaches.

Translation of Findings and Impact

- ✓ Continued analysis of the occupational health indicators guides our efforts to identify workers and occupations at greater risk of occupational injuries and illnesses. The key impact of OHI analysis is to ensure priority setting at a state level. Intermediate outcomes include use of data (program outputs) by peers and stakeholders to change policies, practices, or behaviors, and ultimately reduce the burden of occupational injury and illness for a targeted worker population or industry group.
- ✓ Worked closely with NH DHHS regarding analysis methods for the OHIs (specifically for adult blood lead cases) which has resulted in the revision and/or improvement of the estimation of adult lead values for the state. The NH Healthy Homes and Lead Prevention Program collaborated with the NH OHSP to report elevated blood lead levels among adult workers. Highlights of the report are included in HHLPP newsletters and Advisory Committee meetings.
- ✓ The dissemination of industry and occupation estimates for people with and without disabilities in the Annual Disability Statistics Compendium has resulted in an evidence-based resource for employment- and advocacy-focused services for people with disabilities. This resource is utilized by federal funding agencies such as NIDILRR to determine programmatic goals and supports and national advocacy organizations such as the Association of University Centers on Disabilities (AUCD).
- ✓ NH was highlighted in the CSTE Occupational Health Success Story site for: Building partnerships to improve workplace accommodations for breastfeeding moms: https://cdn.ymaws.com/www.cste.org/resource/resmgr/occupational_health_success_stories/2018_NH_Success_Story__2_.pdf
- ✓ NH OHSP was featured in the November 2019 NIOSH eNews with announcement (*Collecting Industry and Occupation Data: A Training Guide for Hospital Staff)* of an on-line training module to help hospital staff improve their collection of hospital patients' industry and occupational information. These data are critical in treating and preventing workplace exposures. The online training meets the National Cancer Registry Association requirements for one credit education unit. https://www.cdc.gov/niosh/enews/enewsv17n7.html#news
- ✓ Explored "injured at work" and "who paid for injury" in the BRFSS 2011 – 2020. Published report in 2015, which was presented to the NH Commission to Recommend Reforms to Reduce Workers' Compensation Medical Costs. Minority report used information on cost-shifting from our report to recommendation that WC claims be included in the NH Comprehensive Health Care Information System (CHIS) database.
- ✓ The NH legislature is considering a bill relative to workplace accommodations for all working mothers in NH. This effort is the result of the NH OHSP's contribution to NH DHHS, the NH Breastfeeding Advisory Council and the NH Breastfeeding Taskforce combined efforts to push for more comprehensive workplace policies. This effort strengthened NH DHHS's relationship with businesses, stakeholders, and community members.
- ✓ Collaboration with the NH DHHS Injury Prevention Program and the State Injury Prevention Advisory Committee resulted in inclusion of occupational health indicators in the State Injury Report. These included commercial motor vehicle crashes, occupational poisoning, and fatalities by industry where cause of death is opioid overdose or suicide. This is an important step in building awareness among injury prevention public health professionals about the role work-related injuries play in the overall state injury burden.
- ✓ Reports and Data Briefs are published and shared with stakeholders through the UNH IOD social media accounts, through an OHSP newsletter, and via the NIOSH Clearinghouse.
- ✓ As a result of the activities over the last 6 year grant period, the NH OHSP has produced more data, contributed to national occupational health surveillance discussions, explored injury and illness rates within several industries and occupations, and applied standards of quality improvement in all program areas.

Section 2

Scientific Report – Fundamental Plus Occupational Health Surveillance

A. Background

Work is a social determinant of health. The World Health Organization recommends full and fair employment and decent work as a central goal of national and international social and economic policy-making.[i] Where a person works and what that person does has an impact on individual health outcomes, including stress, well-being, chronic disease, and injury and illness. It is critical to monitor these outcomes from a *public health and community-based surveillance system approach*, with particular focus on the experience of special and vulnerable populations. A primary goal of community-based surveillance is to inform key public health stakeholders and policymakers in developing prevention strategies.

State-based efforts to capture more accurate reporting of work related injuries and illnesses began with the development of core occupational health indicators under the "Guidelines for Minimum and Comprehensive State-Based Public Health Activities in Occupational Safety and Health," developed jointly by the Council of State and Territorial Epidemiologists (CSTE) and the National Institute for Occupational Safety and Health (NIOSH).[ii] These indicators are a critical part of a state's surveillance system and are used across program areas in generating a comprehensive picture of the working population's health status. NIOSH is at the forefront, along with its state occupational health surveillance partners, in improving the national occupational health surveillance infrastructure, through the development of these core occupational health indicators and through research aimed at assessing the extent and severity of workplace injury and illness, identifying workers and occupations at greatest risk and developing prevention strategies for work related injuries and illnesses caused by hazards in the workplace.[iii] Public health indicators are a critical part of a state's surveillance system and are used to generate a comprehensive picture of the population's public health status.

A major challenge is that there is not one system that fully captures the burden or magnitude of work-related injuries and illnesses at both the federal and state levels. While states have a central role in public health surveillance—because they are uniquely positioned to utilize state-specific data sources and integrate intervention and prevention activities—occupational safety and health surveillance can also present numerous methodological and program-development challenges. Many of our public health reporting systems are fragmented, do not have data compatible systems, and do not capture occupational information.[iv] In addition, federal occupational health surveillance reporting requirements result in data gaps and shortfalls that do not accurately capture the true nature of occupational injuries and illnesses. Underreporting of occupational injuries and illnesses to the Occupational Safety and Health Administration (OSHA) has also been documented within the occupational health academic field.[v,vi,vii] There are a number of reasons for this problem. The long interval between exposure to toxins and the development of disease has made it difficult to associate the exposures to the disease process. In addition, many diseases have multi-factorial causes making it difficult to determine the exact role of workplace exposures. The failure of health care providers to recognize the association of the disease and workplace exposures and the failure to report work-related diseases also contributes to the under reporting. All of this may result in an inaccurate view that occupational injuries and illnesses are on a downward trend.

For these reasons, additional investigation is needed to augment fundamental occupational health surveillance through further exploration of existing and new surveillance systems, development of new methodologies to standardize collection and analysis of work-related injuries and illnesses, and through performance of in-depth

investigation of important priority occupational health issues that intersect with broader public health programs. It is essential to address the impact of work on health in overall public health efforts to address the full range of health needs of an increasingly diverse and changing workforce.[viii]

B. Specific Aims

The primary aim of this project was to expand state-based capacity for occupational health surveillance in New Hampshire, with a focus on integrating occupational health into mainstream public health through emphasis on intervention and prevention. Major impacts and accomplishments during this reporting period for each of the aims established in the original proposal are highlighted below.

Aim 1. Assess the extent and severity of workplace injuries, illnesses, deaths, hazards and/or exposures

Aim 2. Identify workers and occupations at greatest risk through data collection of industry, occupation, and work status

Aim 3. Develop research and prevention (program) policies through partnerships with public health and non-public health organizations.

Aim 4. Expand outreach and dissemination

C. Progress Achieved under Specific Aims

Aim 1) Assess the extent and severity of workplace injuries, illnesses, deaths, hazards and/or exposures

Activity Outputs:

- **Occupational Health Indicators – An Overview**

Occupational health indicators can provide information about a population's health status with respect to workplace injuries and illnesses or to factors that can influence health. These indicators can either be measures of health (work-related disease or injury) or factors associated with health, such as workplace exposures, hazards or interventions, and socio-economic impact (see CSTE Occupational Health Indicators: A Guide for Tracking Occupational Health Conditions and Their Determinants for additional information). The indicators represent a core set of data that, if collected at the state level, would assist in the development of programs to prevent workplace injuries and illnesses. While analyzing these core data points is part of a fundamental surveillance program, it is expected that states use them in conjunction with other guidelines for state-based surveillance and as a complement to overall state and national goals to improve the health of the population.

The occupational health indicators are estimated from many data sources. They are meant to provide an overview and general assessment of the occupational health status of New Hampshire workers over a span of years for which data are available. Each data source has its strengths and limitations.

Methods
All indicators are calculated using the CSTE Guide for Tracking Occupational Health Conditions and Their Determinants at:
https://cdn.ymaws.com/www.cste.org/resource/resmgr/occupationalhealth/OHI_GuidanceManual_2018_FINA.pdf

Results
Completed 16 of the core indicators and demographics for 2017. Due to data quality issues, the adult lead indicator is under review and we anticipate providing estimates for 2016 and 2017 with next year's OHI.

- A report of these indicators for years 2000 to 2018 was published in March of 2021. https://iod.unh.edu/sites/default/files/media/NHOHSP/Pubs/occupational_injury_and_illness_in_new_hampshired_final.pdf
- Findings for key indicators in New Hampshire include:
  - New Hampshire workers are more likely to be working 40 hours or more per week – increasing from 61.8% to 66.8%. Correspondingly, they are less likely to be working less than 40 hours per week (dropping from 33.8% of those employed to 29.5% in 2018)
  - Workers age 65+ make up a larger proportion of the workforce, increasing from 3.9% of all workers to 7.7%.
  - From 2000 to 2018 there were 264 work-related fatalities in New Hampshire, with 20 occurring in 2018.
  - There were over 1,735 work-related hospitalizations for persons age 16 years and older, where the expected payer is workers' compensation (2012 to 2018).
  - In 2018, one in twenty New Hampshire workers were employed in industries at high risk for morbidity. One in seven are employed in high-risk occupations for morbidity.
  - In 2018, one in seven New Hampshire workers were employed in occupations or industries at high risk for mortality.
  - Asthma (Indicator #21) –2014-2016 estimates document that 14.8% of adults reported they had been told by their healthcare provider that their asthma was work-related

Indicators to Watch

- Work related hospitalizations (indicator #2) has been increasing steadily since 2015 (203 to 288) and merits close review in future years to assess whether the trend continues.
- Work related deaths (indicator #3), have, outside of 2017, shown a steady increase in the rate per 100,000 since 2012, increasing from 2 per 100,000 to 2.8 in 2018.
- Reported adult blood lead levels (Indicator #13) between 10 and 25 µg/dL have increased from 2012 (100) to 2016 (124), while those above 25 µg/dL more than doubled during the same time period from 12 to 27.
- Workers Compensation (Indicator #19) data shows that the average benefits per covered worker is $167 less in 2018 than 2010, a 34% drop in coverage during a time of rapidly increasing health care costs.

Employed Persons 16 Years or Older by Demographic Characteristics, New Hampshire, 2008 and 2018

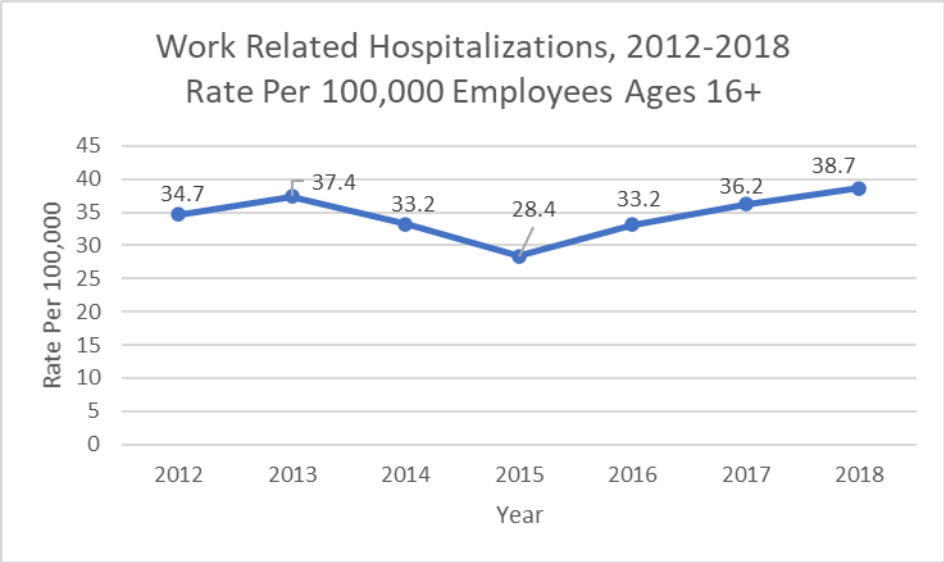
Indicator	2008	2018
Total number of employed persons 16 years or older[1]	712,000	745,000
Percentage of workforce unemployed[1]	3.8%	2.6%
Percentage of employment self-employed[1]	7.6%	7.1%
Percentage of employment in part-time jobs[1]	19.9%	18.3%
Percentage of employment by number of hours worked per week[1,2]		
<40 hours	33.8%	29.5%
40 hours	33.3%	38.1%
41+ hours	28.5%	28.7%
Percentage of employment by sex[1]		
Males	73.2%	72.1%
Females	63.2%	61.9%
Percentage of employment by age group[1,3]		
16 to 17	2.1%	1.9%

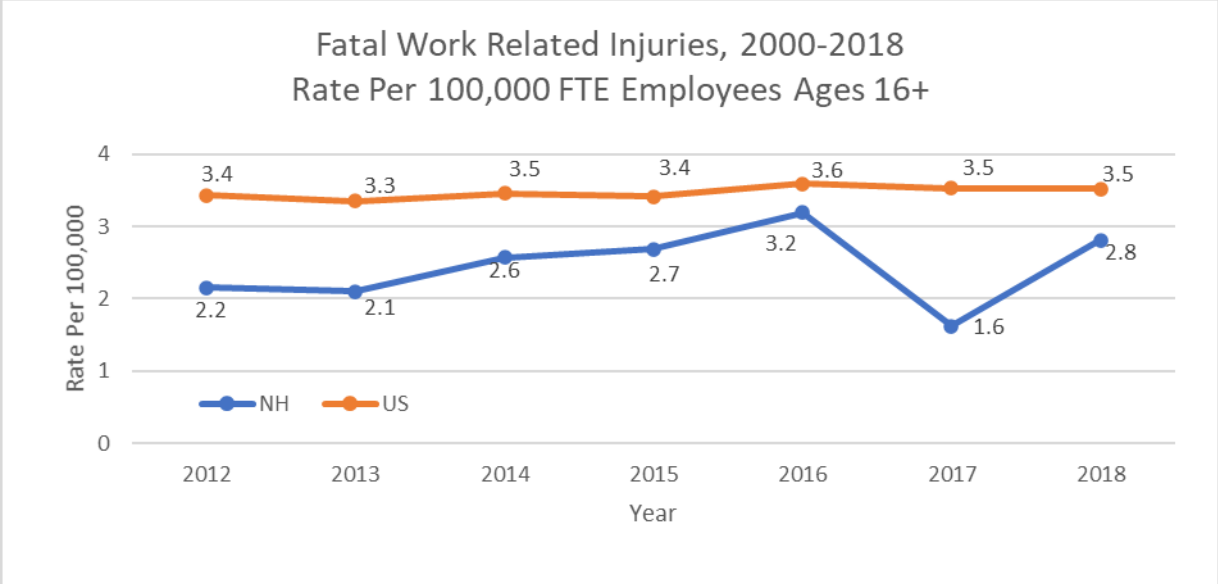
18 to 64	93.9%	90.4%
65+	3.9%	7.7%
Percentage of employment by race[1]		
White	95.9%	93.8%
Black	1.1%	1.2%
Other	2.9%	5%
Percentage of employment by Hispanic Origin[1]	1.8%	3.8%
Percentage of employment by Education, Ages 25+[1]		
Less than a high school diploma	39.3%	NA
High school graduates, no college	64.7%	63%
Some college or associate degree	73.7%	67%
Bachelor's degree and higher	76.9%	74.9%
Percentage of employment by industry[1]		
Agriculture and Related	0.8%	0.6%
Construction	7.4%	8.2%
Education and Health Services	21.9%	23.5%
Financial Activities	6.7%	6.1%
Information	2.7%	2%
Leisure and Hospitality	8%	8.4%
Manufacturing – Durable goods	10.6%	10.4%
Manufacturing – Non-durable goods	3.2%	3.1%
Mining	0.1%	NA
Other Services	4.3%	4.2%
Professional and Business Services	10.6%	12.3%
Public Administration	4.6%	3.9%
Transportation and Utilities	3.9%	3.8%
Wholesale and Retail Trade	15.3%	13.5%
Percentage of employment by occupation[1]		
Construction and Extraction	5.6%	5.7%
Farming, Fishing, and Forestry	0.4%	0.2%
Installation, Maintenance, and Repair	3.6%	2.8%
Management, Business, and Financial Operations	16.8%	18.2%
Office and Administrative Support	13.6%	10.2%
Production	6.6%	7%
Professional and Related Occupations	23.4%	25.2%
Sales and Related Occupations	10.9%	10.2%
Service	14.6%	16%
Transportation and Material Moving	4.6%	4.6%
Percentage of employment by disability[4]		
Living with a disability	43.5%	43.8%
Living without a disability	79.9%	82.6%

Data Sources:
1. BLS Geographic Profiles of Employment and Unemployment (https://www.bls.gov/opub/geographic-profile/archive.htm)

2. Will not equal 100% as the calculation is based on a denominator of 745,000 employed (2018)
3. NIOSH Employed Labor Force query system (for percentage of civilian employment by sex, age, race, and Hispanic origin) (https://wwwn.cdc.gov/wisards/cps/)
4. U.S. Census Bureau. (2007,2018). American community survey, 1-year estimates.

Other Important Findings





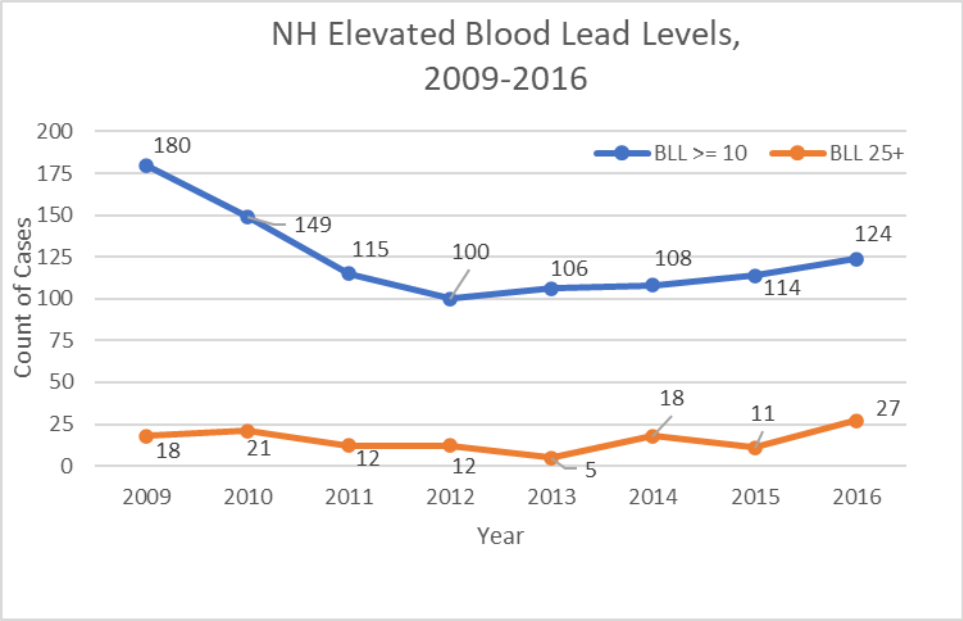
Staff continue to participate in the CSTE Occupational Health Indicator Workgroup, with some attention to developing methods for trend analysis techniques that states can use in reporting indicator data.

- **Adult Blood Lead Epidemiology Surveillance (ABLES) Project**: Published report on adult lead levels for NH adults from 2014-2016.

Methods

A total of 7,981 individual adults were tested (some of these adults may have had more than 1 test submitted in each of the 3 years) and submitted to NH HHLPPP during the three years identified for this study (2014-2016). For the purposes of this study, adult blood lead level tests ≥ 10 µg/dL (n=346) were analyzed by blood lead level, demographics, and industry type. When applicable, trends were analyzed across previous years (2009-2013) as well. Data, including age, gender, blood lead level, and employer, was collected through test results submitted to the State of New Hampshire Healthy Homes and Lead Poisoning Prevention Program (HHLPPP) in accordance with New Hampshire Statue 130-A-3. This law states that any laboratory performing blood lead analysis on adults shall supply "the occupation of individuals aged 16 years and older; and the name of the individual's employer at the time that the blood lead test is performed when testing is a requirement of the individual's occupation." For cases where no employer data was included, HHLPPP staff called providers to determine patients' employers. Each case was classified into industry group using the 2017 North American Industry Classification System (NAICS) codes; the first two digits determine the General Industry Category while full codes were used to classify Industry Subcategory for further analysis. All cases were ordered by unique client ID number, and duplicate tests were removed. When possible, venous blood draw test results were used for analysis, but the few cases with only a capillary test or an unknown sample type were also included (n=27). The final data set included 346 cases, representing the highest blood lead level result for each patient, and blood lead levels were split into three categories: 10-24 µg/dL, 25-39 µg/ dL, and ≥ 40 µg/dL. Due to the low number of blood lead levels ≥ 40 µg/dL, the upper two categories were combined for some analyses. The data was analyzed by age, gender, blood lead level, and employer industry. Of the 346 total cases within the three-year period, employment information was obtained for 299, including individuals who were retired (n=8), self-employed (n=5), disabled (n=2), and unemployed (n=2).

Results



- Blood lead test results by level by year: Years 2014 and 2015 follow earlier trends with between 80 and 90% of cases represented by lower BLL results (10-24 µg/dL) and only 1-2% at 40 or above. 2016 saw an increase in the percentage shared by higher results, with over 20% of cases above 25 µg/dL and 4% of cases at 40 or above.
- The top three most common industries were Manufacturing (34%), Construction (32%), and Waste Management and Remediation (19%).
- Our analysis indicates that long-term lead exposure continues to be a problem in our New Hampshire businesses and industries.
- Policy Impact: With the knowledge we now have about the health impact of chronic low-level exposure to lead, it is critical that public health experts work with occupational health and safety professionals to not only monitor adults for lead exposure but to also ensure that adequate protections are in place. This includes support of medical staff who can assist with tracking, monitoring, and reporting all adult lead cases, with a focus on follow-up to ensure appropriate protections are taken to reduce or eliminate the risk. Ultimately, however, permissible exposure levels in the workplace need to be reduced in order to provide the most effective protection at the source of exposure.

- Published the **NH Asthma Prevalence among New Hampshire Workers**, Behavioral Risk Factor Surveillance System, 2013-2017
  https://iod.unh.edu/sites/default/files/media/NHOHSP/Pubs/2020_final_report_-_asthma_and_work_final.pdf

Methods

The Behavioral Risk Factor Surveillance System (BRFSS) is an ongoing nationwide surveillance system conducted jointly by state health departments and the Centers for Disease Control and Prevention (CDC). The survey collects data annually on a variety of health behaviors and health outcomes through random digit dial telephone and cell phone interview surveys (learn more at http://www.cdc.gov/brfss/). Since 2006, an increasing number of states/territories have implemented the Asthma Call-Back Survey (ACBS) to those BRFSS respondents who reported an asthma diagnosis (https://www.cdc.gov/brfss/acbs/). The ACBS collects additional information on asthma, including work-relatedness. Since 2011, the New Hampshire BRFSS included additional questions in its survey about a respondent's industry and occupation. These data along with asthma prevalence data (as reported in the core BRFSS and the ACBS) were used to calculate current asthma prevalence by industry and occupation for 2014-2016. Current asthma was defined as a survey respondent reporting that a doctor, nurse, or other health professional had ever told them they had asthma and the respondent also reported that they currently had asthma. An employed respondent was defined as an adult who was currently employed, selfemployed, or had been out of work for less than one year at the time of the BRFSS interview. Text responses for occupation and industry reported by New Hampshire BRFSS respondents were coded into the most recent U.S. Census North American Industry Classification System (NAICS) and Standard Occupational Classification (SOC) codes by a combination of expert coders in the National Institute for Occupational Safety and Health (NIOSH) and the NIOSH Industry & Occupation Computerized Coding System (NIOCCS).

The American Community Survey (ACS) is conducted by the U.S. Census Bureau each year. ACS five year estimate data were combined (2013-2017) to estimate the numbers of New Hampshire workers aged 16 years or older grouped by the same NAICS and SOC industry and occupation categories as in the BRFSS analysis.

Analysis for this report was conducted using SAS Software. Standard analysis methods were used to account for the complex sample designs and weighting of the BRFSS. For this report, statistical significance was determined by comparing the 95% confidence intervals of estimates. If the confidence intervals did not overlap, the estimates were considered statistically significant.

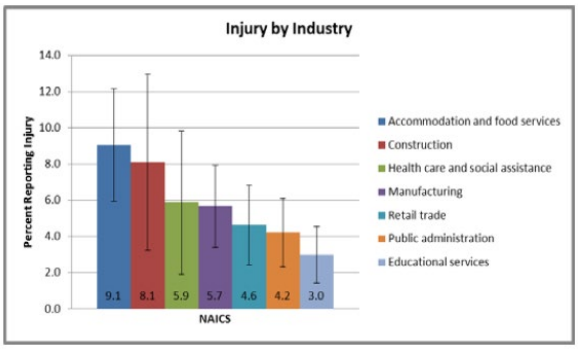
- The top occupation with the highest prevalence of asthma is Healthcare Support (14.2%)
- The top industry with the highest prevalence of asthma is Accommodation and Food Services (13.3%)
- 21.8% of workers reported ever discussing work and asthma with a doctor (2014-2016)
- 14.8% of workers were told by a doctor or other healthcare professional that their asthma was work related (2014-2016)

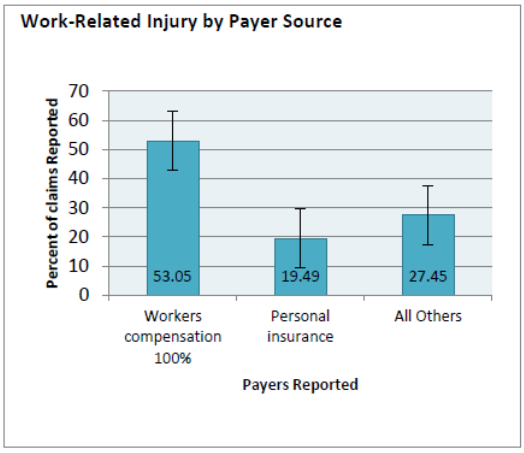
Aim 2) Identify workers and occupations at greatest risk through data collection of industry, occupation, and work status

Activity Outputs

- Added industry and occupation questions to the **Behavioral Risk Factor Surveillance System (BRFSS)** survey for another year. Also added another year of questions on "injured at work" and "who paid for injury." (Early report, "Utilization of the NH Behavioral Risk Factor Surveillance System (BRFSS) to Better Understand Under-Reporting of Work-Related Injuries, 2012-2013" at: https://iod.unh.edu/sites/default/files/media/NHOHSP/Pubs/utilizationnhbehavioralrisk.pdf)

Key Findings





- NH is leading a multi-state collaborative project (approximately 10 states) asking the same questions about injury at work and who paid for it for the 2017 BRFSS survey, with a goal of producing a multi-state report/article focused on under-recording of work-related injuries.
- NH will continue to ask occupation and industry of all respondents in the Behavioral Risk Factor Surveillance System (BRFSS), focusing on the priority areas of NH's State Health Improvement Plan (tobacco use and smoking policies, obesity and diabetes, heart disease and stroke, infectious disease, misuse of alcohol and drugs, cancer, injury prevention, asthma, emergency preparedness,

immunizations, and healthy mothers and babies) working across programs in the NH DHHS to provide data to support prevention and outreach efforts in all of these areas.

- Added industry and occupation to the 2019 **ANNUAL DISABILITY STATISTICS COMPENDIUM** (Rehabilitation Research and Training Center on Disability Statistics and Demographics A NIDILRR-Funded Center).

    - Using American Community Survey, statistics are presented for the United States overall and by state for the top four most prevalent industries and occupations among people with disabilities. This section will be updated annually in a standardized fashion for future years of the compendium at www.disabilitycompendium.org (funded through 2023).

Key Findings:

Approximately 3,800, or 8% of people with disabilities in New Hampshire are employed in the education services industry.

- Approximately 4,800, or 10.1% of people with disabilities in New Hampshire are employed in the manufacturing industry.
- In New Hampshire, 9.0% of people with disabiltiies are employed in office and administartive support occupations, compared to 11.2% of people without disabiltiies.
- In New Hampshire, 12.4% of people with disabilities are employed in transportation and material moving occupations, compared to 5.4% of people without disabilities.

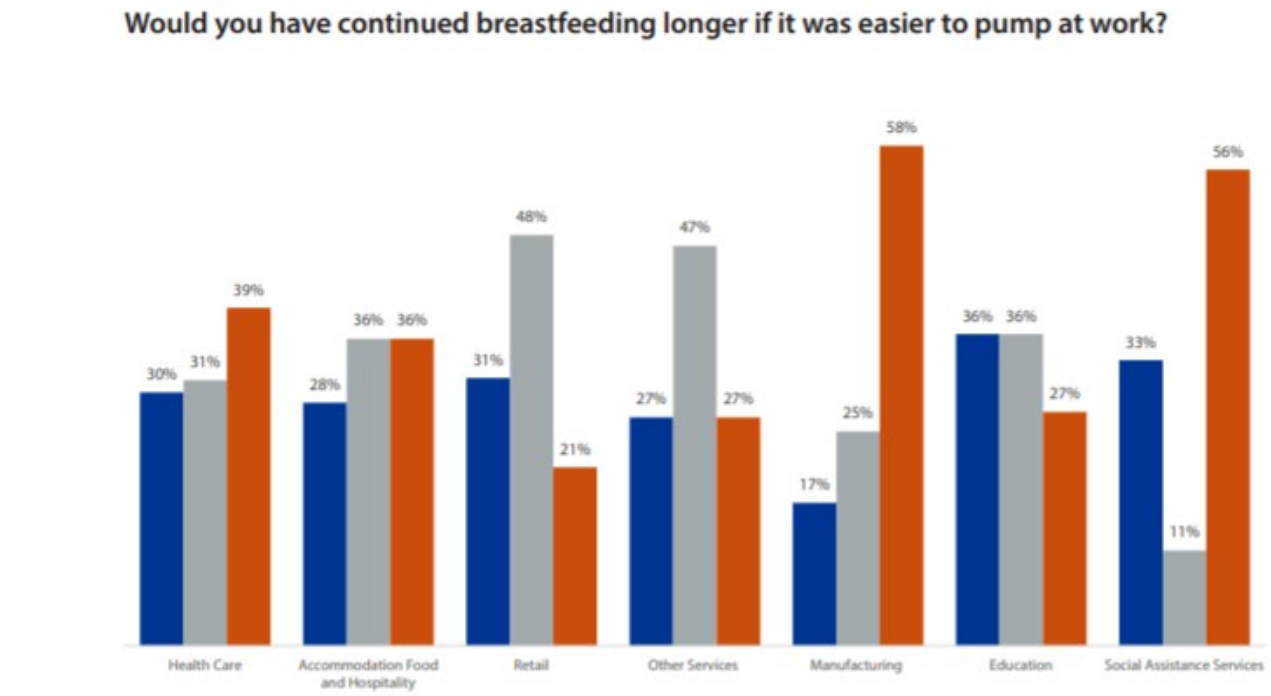
- On an annual basis, the Compendium is disseminated at an event in Washington, DC which is live streamed.
- The Compendium can be found online at www.disabilitycompendium.org and on the NH OHSP Publications Webpage: https://iod.unh.edu/projects/occupational-health-surveillance-program/publications

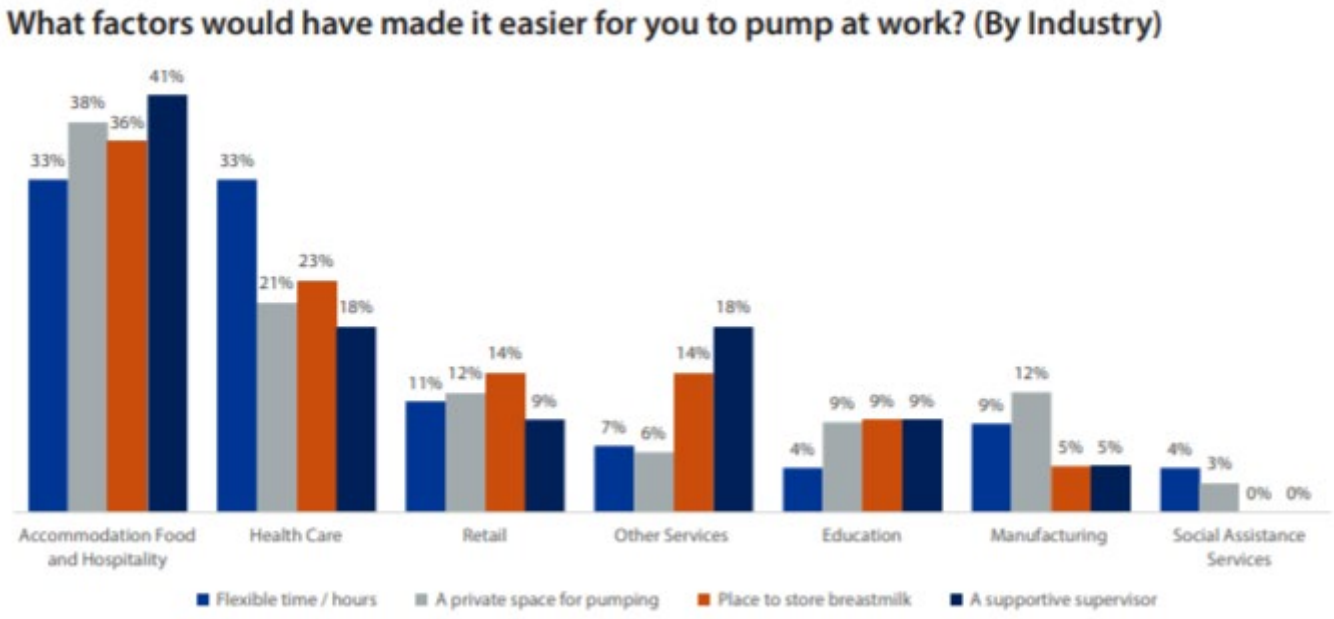
- **Breastfeeding rates and worksite lactation policies**
    - Worked with Maternal and Child Health Section of DHHS to survey moms in the NH WIC program to better understand the barriers to breastfeeding after childbirth, particularly focused on workplace policies and support practices that encourage or discourage breastfeeding after returning to work.

Key Findings:

- 35% of mothers reported that they would have continued breastfeeding if it was easier to pump at work. 62% responded that having flexible time or hours would have made it easier to pump at work. We contributed to the NH DHHS ASTHO-funded project to develop and publish an on-line training program for NH business and industry for creating awareness and implementing supportive employer lactation policies (http://nhbreastfeedingtaskforce.org/education/class/lactation_support/story_html5.html. This work is positioned to provide opportunities to influence future legislation to support breastfeeding accommodations in the workplace for all working mothers.

Key Findings

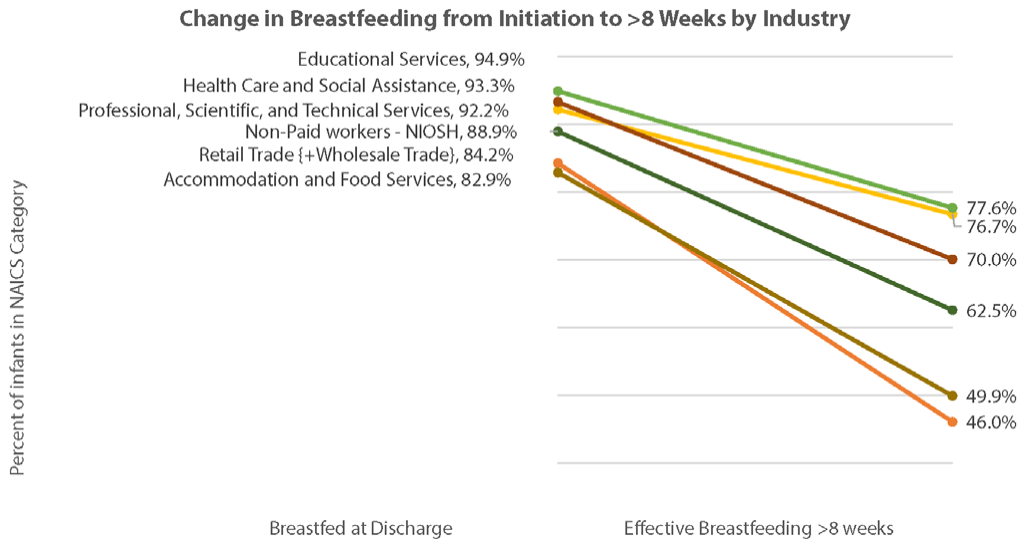


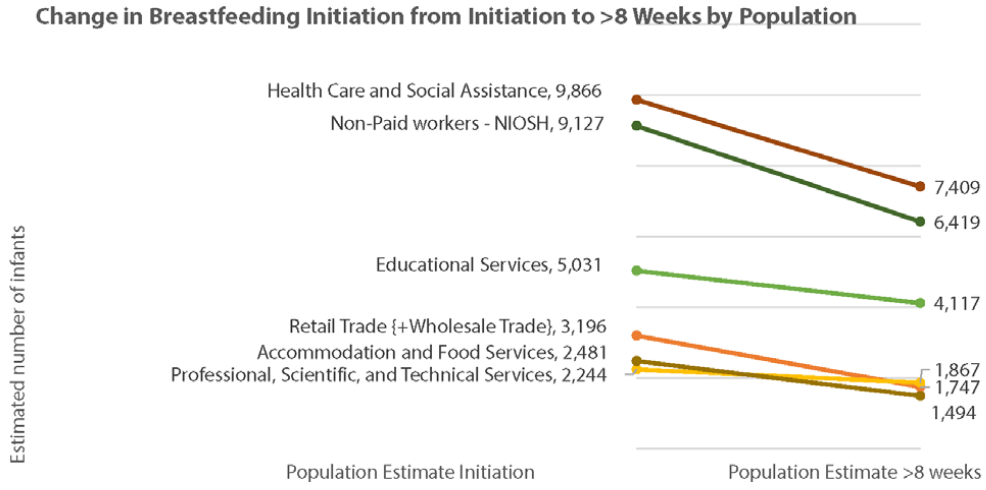


- In follow up to the survey study, we published an article in a special issue of the International Journal of Environmental Research on Public Health, Volume 16, Issue 4. Article title: *Identifying Barriers and Supports to Breastfeeding in the Workplace Experienced by Mothers in the New Hampshire Special Supplemental Nutrition Program for Women, Infants, and Children Utilizing the Total Worker Health Framework,* published 13 February 2019 (https://www.mdpi.com/1660-4601/16/4/529/htm).
  - Variations in the barriers and contributors to breastfeeding across industries have not been well characterized for vulnerable populations such as mothers participating in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Our study used the Total Worker Health Framework to characterize workplace factors acting as barriers and/or

contributors to breastfeeding among women participating in the New Hampshire WIC. Surveys were collected from WIC mothers (*n* = 682), which asked about employment, industry, and workplace accommodation and supports related to breastfeeding in the workplace. We found workplace policy factors supporting breastfeeding (i.e., having paid maternity leave, other maternity leave, and a breastfeeding policy) varied by industry. Women in specific service-oriented industries (i.e., accommodation and retail) reported the lowest rates of breastfeeding initiation and workplace supports for breastfeeding and pumping. Further, how a woman hoped to feed and having a private pumping space at work were significantly associated with industry, breastfeeding initiation, and breastfeeding duration. A substantial portion of women reported being not sure about their workplace environment, policies, and culture related to breastfeeding. Additional studies with larger sample sizes of women participating in WIC are needed to further characterize the barriers to breastfeeding associated with specific industries.

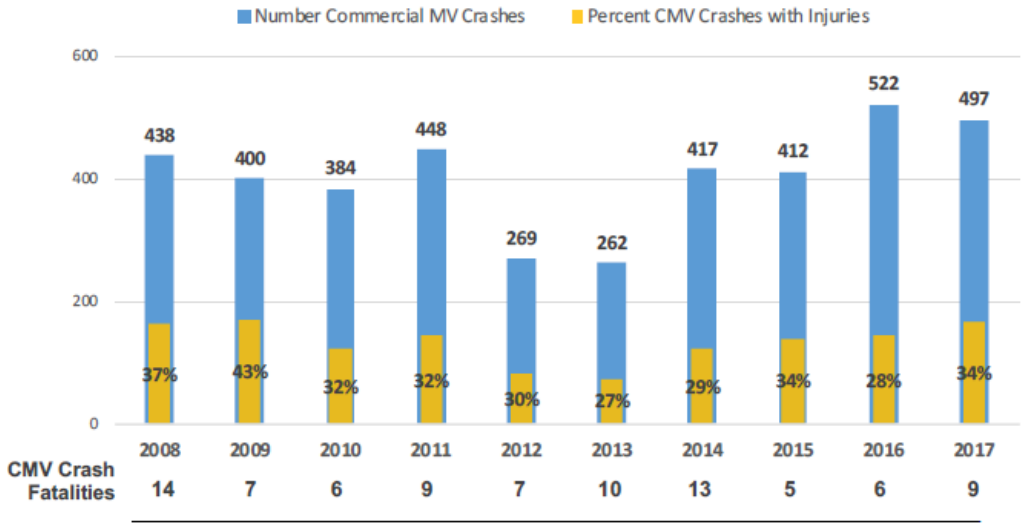
- Continued collaboration with Maternal and Child Health Section of DHHS to analyze breastfeeding rates by industry and occupation for NH resident births for 2014-2016. Report: Supplement Report: Analysis of New Hampshire Pregnancy Risk Assessment Monitoring System (PRAMS) to Better Understand Breastfeeding Initiation and Duration by Industry Category (https://iod.unh.edu/sites/default/files/media/NHOHSP/Pubs/bcbf-prams_report-2020_final.pdf)



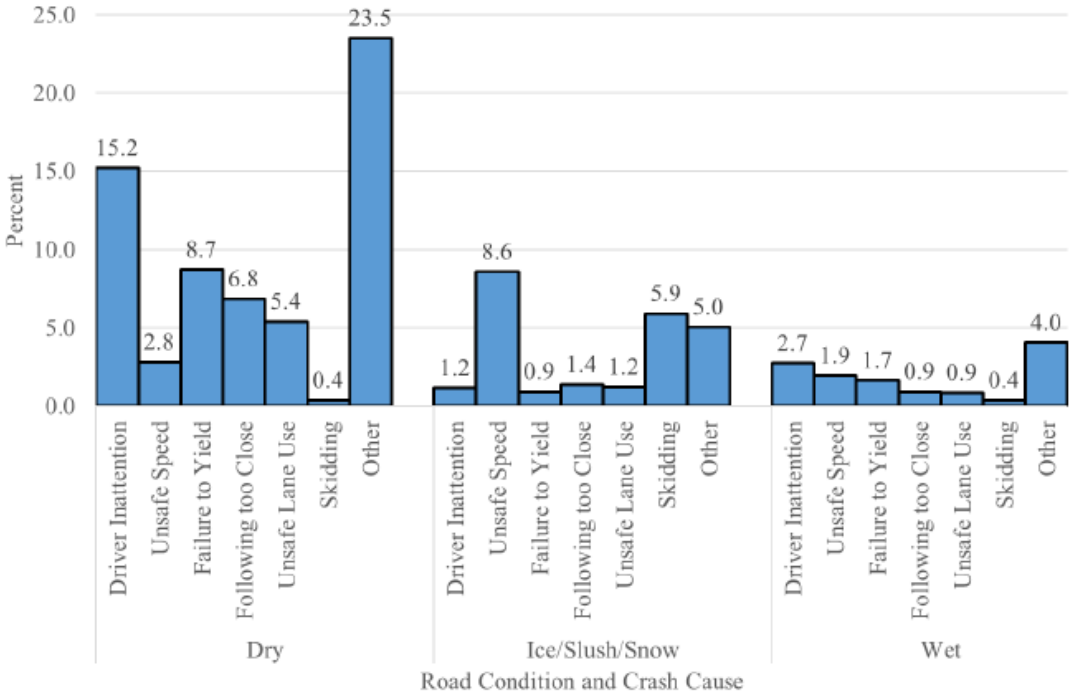


- Worked with the NH Department of Health and Human Services (DHHS) **Injury Prevention Program** (IPP) to include occupational health indicators in the State Injury Report, State of New Hampshire Violence and Injury Prevention 5-Year Plan. (https://iod.unh.edu/sites/default/files/media/NHOHSP/Pubs/nh_violence_injury_prevention_plan_2020-2025-op.pdf) These include commercial motor vehicle crashes and fatalities by industry where cause of death is opioid overdose or suicide.

Number of CMV Crashes in NH 2008-2017 and Percent of CMV Crashes with Injuries



Percent of CMV Crashes in NH 2015-2017 by Road Condition and Crash Cause



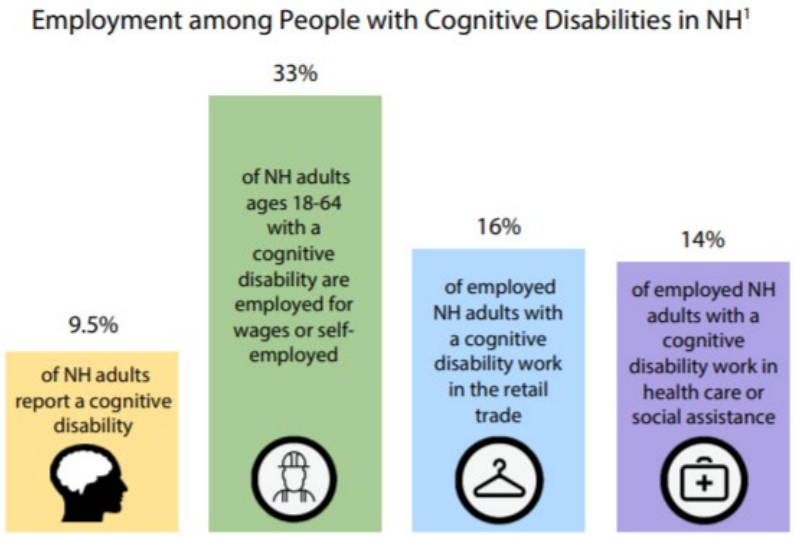
Fatalities by industry where cause of death is opioid overdose or suicide.

- NH's workforce has been severely impacted by the state's opioid crisis in recent years. All age groups of workers have been affected by opioids, but in 2018, those in their prime working age of 30-49 accounted for 55% of lethal overdose deaths in workers. In the last five years in NH (2014-2018), those working in the construction industry have had the highest incidence of opioid overdose deaths, accounting for one-third (36%) of all overdose deaths among workers.

➢ We published a study on **"Identifying the Gaps in the Methodology of NH Farm Injury Surveillance using Hospital Discharge Data."** (https://iod.unh.edu/sites/default/files/media/NHOHSP/Pubs/farm-issue-brief.pdf) This information was used by Dartmouth College (Geisel School of Medicine) in discussions with a large medical center in northern New Hampshire to provide additional training to rural medical providers about farm-specific health issues.

➢ **Employment and Cognitive Disabilities**

Worked with the NH Disability & Public Health Project at the Institute on Disability to publish an issue brief on Employment and Cognitive Disabilities.
https://iod.unh.edu/sites/default/files/media/DPH/in_focus_employment.pdf

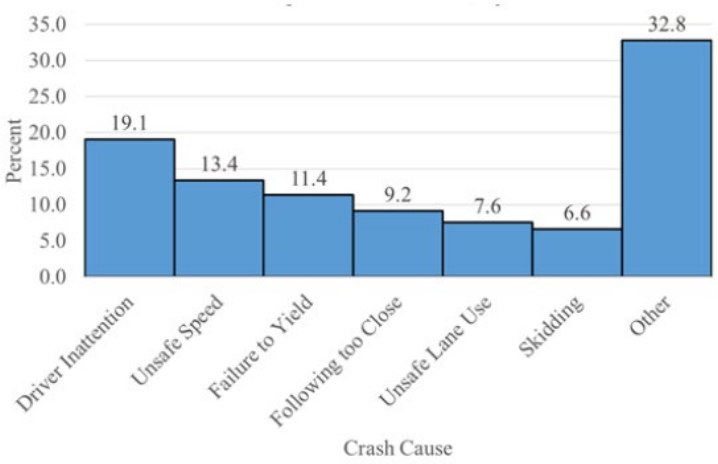


- Continued collaboration with the **Department of Safety, State Police Operations**, to evaluate risks associated with commercial vehicle operation and truck driving by analyzing commercial motor vehicle crashes (CMVC) reported in the Integrated Database Management System (IDMS), including fields such as, type of accident, location, road condition, surface condition, weather, pre-accident vehicle action, vehicle defects, occupant condition and body location of most severe physical complaint, safety equipment used, and apparent contributing factor.

Key Findings**:**

Our work has found driver inattention/distraction was the leading cause of crashes when driving conditions were good (i.e. dry roads with no adverse weather) and that driving at unsafe speeds was the leading cause of accidents when driving conditions were poor (i.e. wet or icy roads with adverse weather such as rain or snow). Crashes caused by driver inattention were more likely to occur among middle aged (36-65) drivers, in lighter vehicles (weighing 10,000-26,000 pounds), and during daylight hours.

Percent of Commercial Motor Vehicle Crashes in NH 2015-2017, by Crash Cause



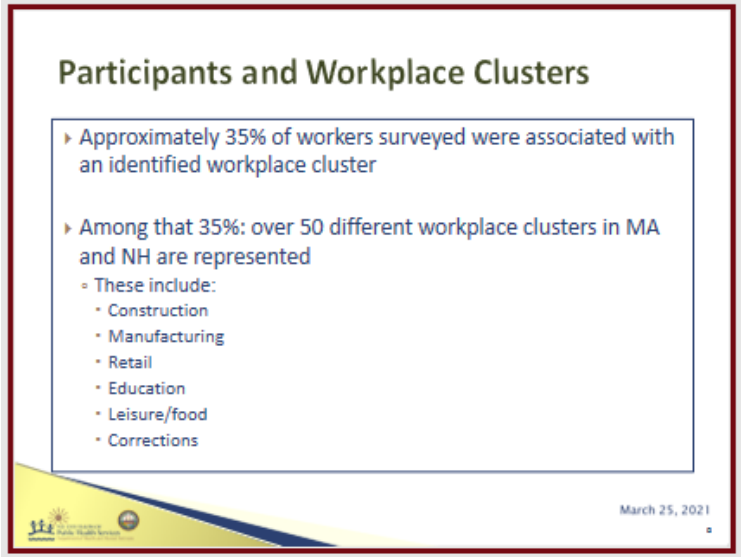
Findings from these analyses were presented at the NH Traffic Safety Conference in May of 2019 and at the CSTE Annual Meeting in Raleigh, NC in June of 2019, as well as a poster presentation at the 2019 Annual Public Health Association Conference in Philadelphia, Pennsylvania. The report is published at: https://iod.unh.edu/projects/occupational-health-surveillance-program/publications and the NIOSH Clearinghouse at: https://wwwn.cdc.gov/niosh-statedocs/Documents.aspx?t=SNH&p=&s=

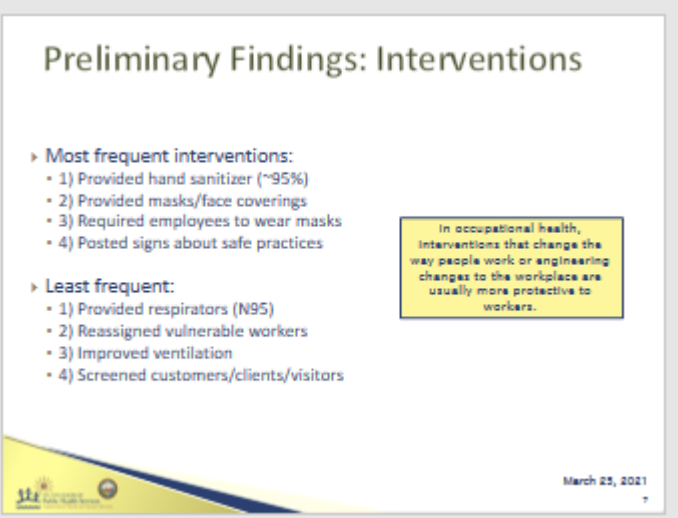
Aim 3) Develop research and prevention (program) policies through partnerships with public health and non-public health organizations.

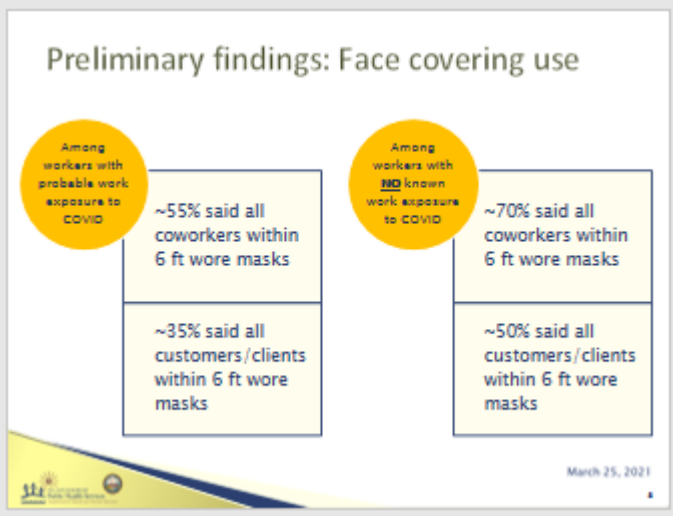
Activity Outputs

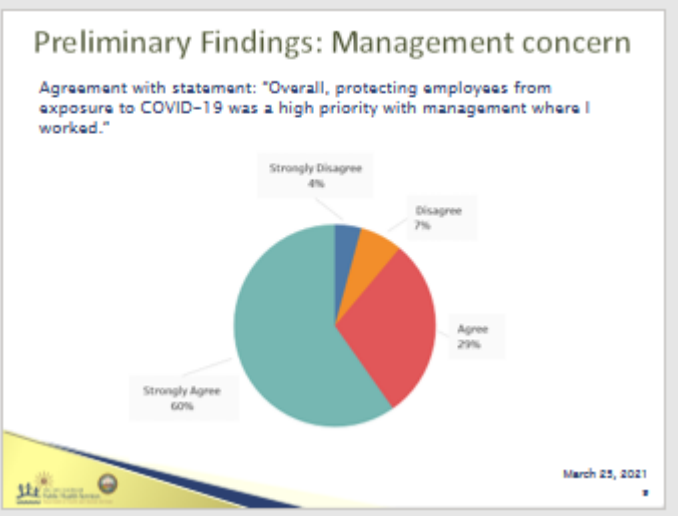
Partnerships

- In partnership with NH DHHS, we participated as one of 6 states in the NIOSH COVID-19 Callback Survey. The survey was developed in collaboration with NIOSH and the other 5 states as a scripted phone survey targeted at people who worked outside the home in the 14-day period before experiencing COVID symptoms or getting a COVID positive test. No contact with employers was included. While it's not clear how many of the COVID-19 infections that have occurred among workers in NH were acquired through work, it is known that many workers are at risk of exposure through the course of their work due to their interactions with the public and close interactions with co-workers. The goals of this project are to better understand the work experience of non-healthcare workers in NH and nationally during the COVID19 pandemic and to strengthen current and future COVID response strategies, as well as guide future worker protection for infectious disease risk.
- Preliminary Key Findings – presented in collaboration with NH DHHS to the NH Economic Re-Opening Task Force, March 25th 2021. While NH data will be combined with the others states' data in a final NIOSH report, we are working with NH DHHS to publish NH specific data in a new issue brief.









➢ **Vaccination rates of healthcare personnel** and workplace influenza policies

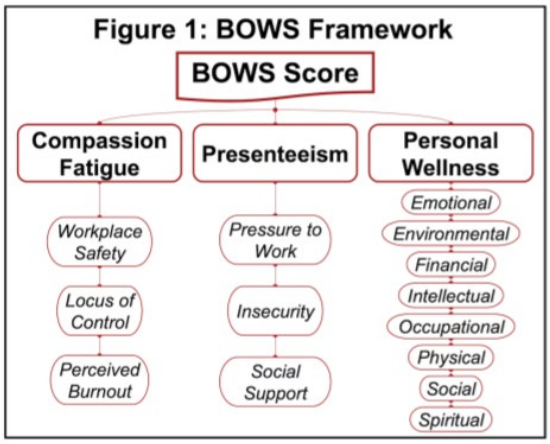
Worked with NH DHHS Bureau of Infectious Disease Control, Healthcare Associated Infections (HAI) Program to collect data on flu vaccination behaviors among all employees (including healthcare personnel) in NH hospitals through an anonymous survey and targeted focus group discussions. Focus was on better understanding of the impact of healthcare facility influenza vaccination policies on HCP influenza vaccination rates, and better targeting of interventions, outreach, and education to inform both HCP and healthcare facilities about the development and impact of these policies.

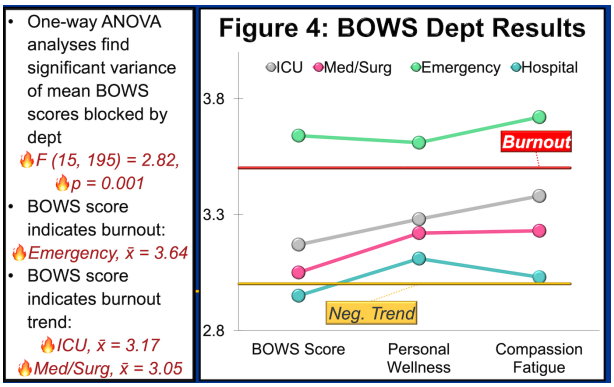
Key Findings**:**

- Of 518 total respondents, 85% worked full time and had been working in the healthcare field for over 10 years; the majority of respondents worked in administrative or clerical (28%) with registered nurse or LPN at 26%. 83% reported their facility required flu vaccination; of those with this requirement, 395

received the flu vaccine and 13 did not. The top reason for receiving the flu vaccine was reported as, "my employer requires me to be vaccinated for the flu." The top reason for not receiving the flu vaccine was, "I feel it infringes on my rights." 83% of the respondents reported that educational information provided by the employer did not have an influence on receiving the flu vaccine. Policy Impact: NH hospitals may use the data from our study to improve efforts around training and education of hospital staff on the importance of flu vaccination. Report published in January 2018. Press Release shared on the Institute on Disability's Social Media Channels and Website; NH OHSP newsletter reached 248 recipients. Also sent through the NH Hospital Association to the list serv members representing 26 NH hospitals. The study was published in October of 2017 and highlighted in NIOSH eNews in April of 2018. (https://iod.unh.edu/sites/default/files/media/NHOHSP/Pubs/influenza_policies.pdf)

- We have spent a considerable amount of time researching the issue of **job overload among healthcare providers in New England hospitals** (MA and NH). A culmination of this research is a partnership with Exeter Hospital in NH to assess job overload among hospital healthcare providers focusing on work organization factors and individual stress levels. We worked with a UNH MPH Student to develop a framework for our survey, "Burnout and Occupational Well-Being Survey" or BOWS. A poster was presented at the NH Public Health Association's Annual Meeting. https://iod.unh.edu/sites/default/files/media/NHOHSP/Pubs/bryan_patriquin_grc_research_poster.pdf





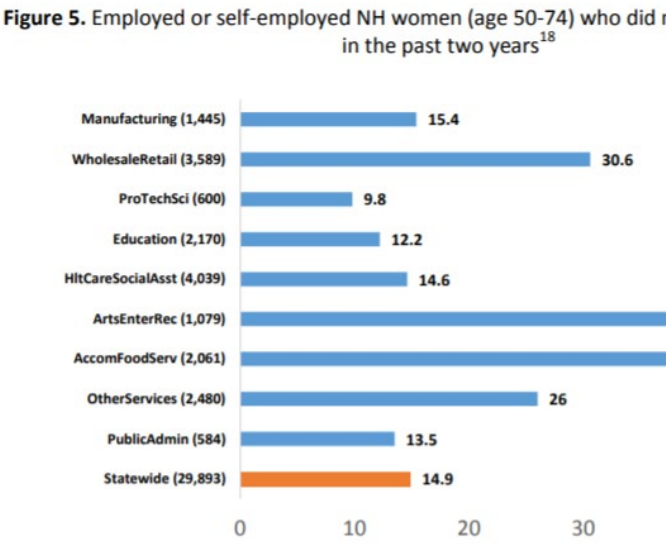
- Collaboration with the **NH State Cancer Registry** (NHSCR) and the NH Comprehensive Cancer Collaborative
  - Worked with the NHSCR and NIOSH to explore the quality of industry and occupation data in the NH cancer registry compared with the industry and occupation data reported on the NH death certificate for cancer deaths.

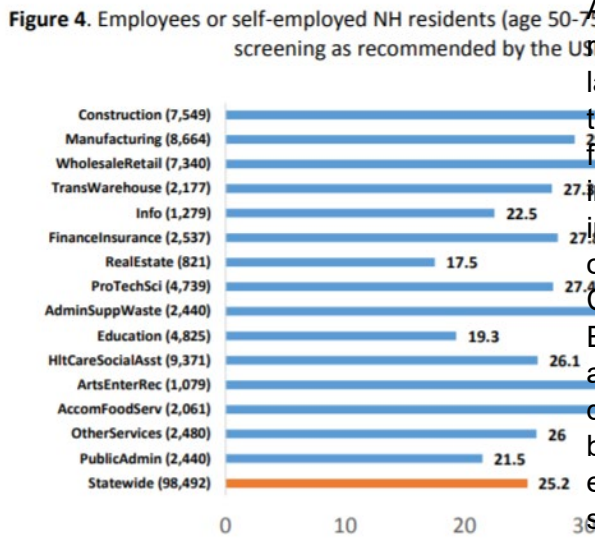
Key Findings

  - For data 2009-2011, of the 4624 cases included in the study, 42% (n=1940) of NHSCR had the same occupation reported in the death certificate. 43% (n=1963) cases had the same industry. NHSCR had more unknown I and O (~30%) than what was reported on the death certificate.
  - Impact/Implications for future surveillance improvements: It may be feasible to improve I/O data in the NHSCR for cases who have died. However, data may not be comparable to those still alive. Therefore, it may be useful to introduce separate fields for I and O from NH death data and NHSCR, so that the distinction is retained. The plan is to continue this research with more years of data for publication in a peer reviewed journal.

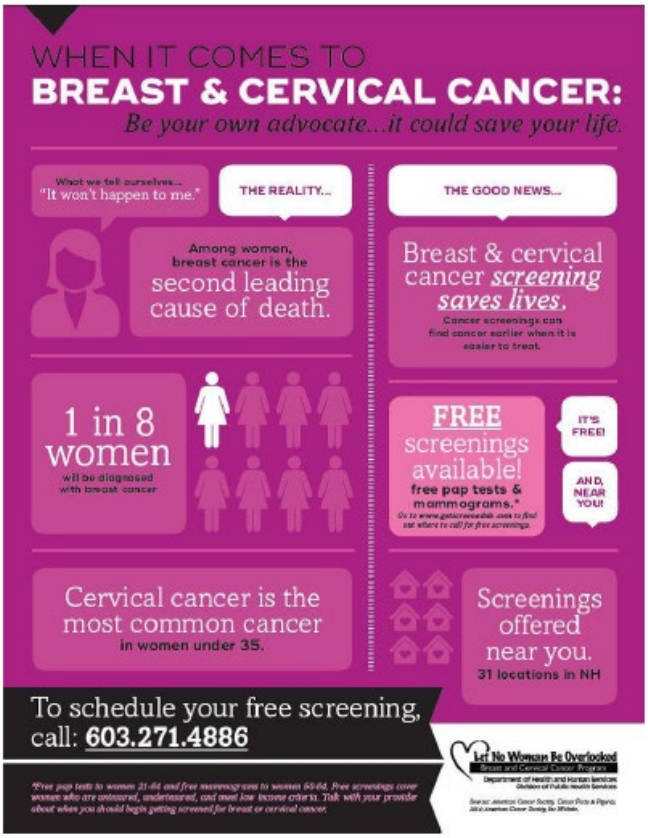
- Presented study in a poster session at the NAACCR (North American Association of Central Cancer Registries) 2016 annual conference. (https://iod.unh.edu/sites/default/files/media/NHOHSP/Pubs/naaccr_poster_2016_-_i_and_o_data_from_registry_and_death_data.pdf)

- Worked with the NH Comprehensive Cancer Collaborative and the NH Equity Task Force to examine preventive cancer screening rates among vulnerable adults in NH. White paper published at: https://iod.unh.edu/sites/default/files/media/NHOHSP/Pubs/nh_white_paper_cancer_screening_-_food_service_industry_nov2016.pdf





As a result of the Industry and Occupation data findings regarding cancer screenings, the NH Equity Task Force launched two initiatives to reach a disparate population in the workplace. This was used in conjunction with the focus group findings to tailor the messages of the initiative to be most impactful to restaurant and food industry employees. The first step was the development of an infographic poster by the NH Breast and Cervical Cancer Program. The Infographic was distributed in both English and Spanish to 1,500 restaurants statewide with a cover letter to restaurant owners, asking them to display the posters in a location where employees would be most likely to view it. The letter also included an explanation that their employees were less likely to get screened, compared to workers in other industries, since in the focus groups, the industry owners/managers reported that this information was compelling to them. The infographic includes a call to action and provides a NH toll-free number to call and inquire about free breast and cervical cancer screenings offered in the state



Staying Safe at Work is a six-lesson training program designed to teach basic occupational safety and health knowledge and skills to young and older workers, and students with intellectual and developmental disabilities. It was developed by the Labor Occupational Health Program (LOHP) at the University of California Berkeley with support from the National Institute for Occupational Safety and Health (NIOSH). Dr. Armenti received training directly from LOHP to conduct in-person Train-the-Trainer sessions in New Hampshire.

Dissemination: We have conducted two in-person Train-the-Trainer sessions for one of New Hampshire's largest disability service providers, reaching 17 professional staff and coaches working with persons with intellectual and developmental disabilities. Also trained one-on-one with another provider focused on job coaching. There is notification of training opportunities on our *Trainings* webpage at: https://iod.unh.edu/projects/occupational-health-surveillance-program/trainings.

Additional Partnerships Developed

- NIOSH Total Worker Health

Applied for and received status as a NIOSH TWH Affiliate in 2018.

- **Industry and Occupation Data Collection Training**
  - Poison Centers - We completed the development of an on-line training module for staff at state or regional poison centers on: Collecting Industry and Occupation Data: A Training Guide for Poison Centers. This can be found at: https://iod.unh.edu/projects/occupational-health-surveillance-program/trainings and on You-Tube at: https://www.youtube.com/watch?v=ECoE8EYB7tc&feature=youtu.be. Cancer Registrars - Received approval from the National Cancer Registrars Association for education credits (CEUs) for completing the same training. Worked with NH State Cancer Registry staff to apply this on-line I/O training to its suite of trainings for hospital cancer registrars.
- **"Staying Safe at Work" Train the Trainer Workshop**

Outreach: Shared status in NH OHSP newsletter and online at: https://iod.unh.edu/projects/occupational-health-surveillance-program.

- Continued participation on the NH Asthma Collaborative, chairing the Asthma and Work subcommittee. Worked with NH DHHS Asthma Program to produce issue briefs and data reports on the prevalence of work-related asthma.
- Continued participation in the Technical Advisory Committee of the NH Environmental Public Health Program (EPHT). Partnership with the NH EPHT includes analysis of the work-related heat indicator.
- Continued working with NH DHHS Chronic Disease section - exploring chronic disease by industry and occupation in the BRFSS.
- Dr. Armenti is a member of the NH Injury Prevention Advisory Council. Worked with stakeholders to contribute occupational health indicators to the State Injury Plan. Injury Prevention report includes occupational health indicators for commercial motor vehicle crashes and fatalities of opioid overdose among NH industries.

https://iod.unh.edu/sites/default/files/media/NHOHSP/Pubs/nh_violence_injury_prevention_plan_2020-2025-op.pdf

- Dr. Armenti is a member of the Health Working Group of the NH Air National Guard (ANG) of the Pease Air National Guard Base, providing expertise on occupational exposures to ANG leadership as a result of workplace activities and contaminated water at Pease.
  - *Assisted in development of methods for a retrospective cohort study to explore site-specific cancer deaths among military personnel assigned to Pease Air Force Base and Air National Guard from 1970 through 2018.*
- Dr. Armenti is an Advisory Council member of the State Governor's Recovery Friendly Workplace (RFW) initiative, focused on supporting business and industry dealing with opioid addiction issues in the workplace.
- Provided expertise to DPHS to inform and plan for protection of emergency response workers in the NH Public Health Emergency Plan (PHEP), Capability 14 (Worker Safety and Health).
  - Worked to facilitate understanding and adoption of the NIOSH Emergency Responder Health Monitoring and Surveillance (ERHMS) by NH DHHS in addressing needs under Capability 14.
- Continued participation in the NIOSH-CSTE Subcommittee meetings on COVID-related surveillance actiities.
- Dr. Armenti is also a member of the Planning Committee for the New England OSHA Roundtable

Aim 4) Expand outreach and dissemination

Activity Outputs

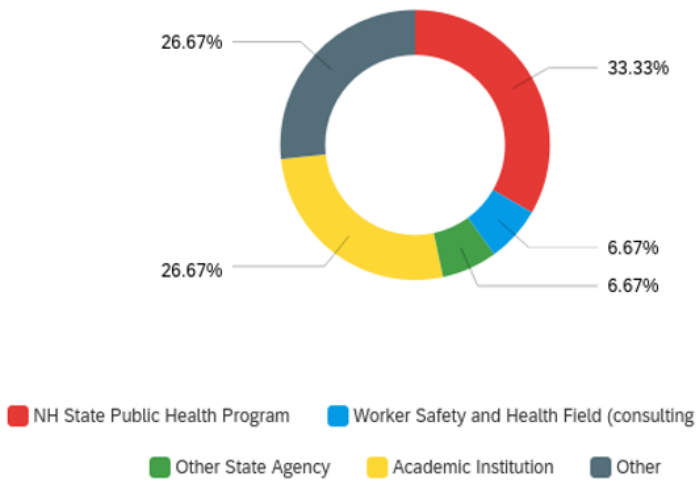
In addition to the publications and partnerships discussed above, the following activities highlight expanded outreach and dissemination:

- NH was highlighted in the CSTE Occupational Health Success Story site for: Building partnerships to improve workplace accommodations for breastfeeding moms: https://cdn.ymaws.com/www.cste.org/resource/resmgr/occupational_health_success_stories/2018_NH_Success_Story__2_.pdf
- NH OHSP was featured in several NIOSH eNews announcement (News from our Partners)
  - New Hampshire Releases New Report on Asthma Prevalence by Industry and Occupation at https://www.cdc.gov/niosh/enews/enewsV12N9.html#news
  - Study by New Hampshire Surveillance Program on Injuries and Underreporting at https://www.cdc.gov/niosh/enews/enewsv13n4.html#news
  - New Hampshire Health Surveillance Program Develops Fact Sheet on Salon Safety at https://www.cdc.gov/niosh/enews/enewsv13n5.html#news
  - New Hampshire Publishes Report to Better Characterize Lower Blood Lead Levels in Adults at https://www.cdc.gov/niosh/enews/enewsv14n5.html#news
  - New Hampshire Comprehensive Cancer Collaboration at https://www.cdc.gov/niosh/enews/enewsv15n3.html#news
  - New Report Explores Barriers to Breastfeeding in the Workplace at https://www.cdc.gov/niosh/enews/enewsv15n8.html#news
  - Impact of Influenza among New Hampshire Healthcare Personnel at https://www.cdc.gov/niosh/enews/enewsv15n12.html#news
  - New Report on Commercial Motor Vehicle Crashes in New Hampshire at https://www.cdc.gov/niosh/enews/enewsv16n12.html#news
  - Collecting Industry and Occupation Data: A Training Guide for Hospital Staff at

https://www.cdc.gov/niosh/enews/enewsv17n7.html#news

- Asthma Prevalence Among New Hampshire Workers at https://www.cdc.gov/niosh/enews/enewsv18n1.html#news
- Report on Breastfeeding Practices by Occupational Industry at https://www.cdc.gov/niosh/enews/enewsv18n12.html#news

➢ Conducted a program **performance review (evaluation)** of the accomplishments and impact of surveillance activities by following the CDC Evaluation Framework guidelines for evaluation of a public health surveillance program. Distribution of respondents are broken down this way:



- In response to a question about what impact the NH OHSP has had on the respondent's work, the majority stated changes in knowledge (35%), changes in skills (21%), and changes in practices and procedures (14%).
- 90% of respondents reported that, from their perspective, NH OHSP has raised the awareness and provided useful information about occupational safety and health issues in NH.
- In response to a question about what the NH OHSP can do to support/impact/assist their occupational health and safety priorities, the majority of respondents stated more publications/published reports, more outreach (more frequent newsletters and webinars)
- Qualitative responses from key informants include:
  - *"Prevention is hard to measure so it's important to me to obtain data to show where to put resources and where to spend time working on the issues. To take this a step further, the data is being used to prevent injuries and work-related illnesses in the future."*
  - *"Having data is one thing, but outreach efforts are equally important. I have not heard a lot about the outreach efforts from the program."*
- Overall, the NH OHSP is effective and has done a tremendous amount of educating the public of occupational safety and health issues in the state. As expected, measuring an impact that is not tangible is challenging, but it is possible. Although the program has come far regarding partnerships and recruiting stakeholders, there is work to do in outreach and community growth.

➢ Revised and updated NH OHI data for display in Tableau on the NH DHHS website. (https://wisdom.dhhs.nh.gov/) The OHI's were initially displayed in the New Hampshire DHHS NH WISDOM platform. Due to changes at NH DHHS, WISDOM will no longer be supported. Tableau will replace the WISDOM system. New data years have been introduced into most of the indicators. The plan is to update them all with the most recent years data in the coming months.

Distribution

The NH OHSP has a mailing list of 224 individuals who receive our newsletter. These go out 3-4 times a year.

All Program Publications are posted on the NH OHSP Program Homepage, CSTE Website, and NIOSH Clearinghouse

According to the UNH Readership Report for the NH OHSP, documents/publications from the OHSP website were downloaded 43 times by entities in 15 different countries. 37% were by educational institutions, 25% were by government agencies, 25% were by commercial entities, and 12% by Other Organization.

Social Media

The UNH IOD sent 3 Tweets out and posted 3 times on Facebook about OHSP publications between July 2020 and June of 2021. A publication announcement was shared with 15,702 recipients via 10 different IOD email blasts.

The NH OHSP has its own program website where all reports and dissemination products are available: https://iod.unh.edu/projects/occupational-health-surveillance-program

The Institute on Disabiltiy hosts its own website (https://iod.unh.edu/about-institute) with a link to the NH OHSP. In addition, the IOD highlights OHSP activities and publications on the News webpage at:

https://iod.unh.edu/news and in its Newsletter at: https://iod.unh.edu/newsletters/vision-voice

All NH reports and publications are listed on the NIOSH Clearinghouse at:

https://wwwn.cdc.gov/niosh-statedocs/

Training and Professional Development Opportunities

Dr. Armenti participated in a full day NIEHS (National Institute of Environmental Health Sciences) train-the-trainer worker training program on opioid-related hazards in the workplace. Focus areas included:

- Scope and severity of the opioid crisis.
- Relationship between workplace injuries and illnesses, working conditions, and opioid use disorder.
- Identification of occupational exposure, prevention, and response.
- List of actions that might be taken at the workplace to prevent and respond to opioid misuse.

This training supports Dr. Armenti's contribution to the work of the NH Recovery Friendly Workplace.

Dr. Armenti continues to guest lecture on the topic of occupational health surveillance in the UNH Master of Public Health Program, and in the UNH undergraduate Health Management Program. Dr. Armenti also taught a course on occupational safety and health in the UNH MPH program. We will be working with a student from Dartmouth College this semester on chronic disease indicators in the Behavioral Risk Factor Surveillance System Survey. Working with and educating students in occupational health surveillance is a natural fit for a program situated in the University, and allows for enhanced knowledge and interest in occupational safety and health as a key component of public health.

Conclusions

The data presented in this report provide an overview of the occupational health status of New Hampshire workers over a span of years. However, these data are far from complete and do not give a totally accurate picture of the true nature of occupational illnesses and injuries in New Hampshire. Due to the limitations inherent with data sources used, many of these measures are conservative estimates of work-related injury and illness in New Hampshire and nationally. Some trends suggest a decrease in many of the occupational injury and illness rates in New Hampshire, but due to chronic underreporting and lack of enforcement at the federal and state level, we are unable to document the true incidence and severity of the problem.

Data are often unavailable to specifically identify the industries at highest risk and to document the type of industry or occupation a person might work in. Detailed information about subgroups of the working population at

risk and how the injury occurred are also absent from these data systems. Many administrative datasets do not collect industry and occupation variables. Information about less common injuries and illnesses is also poorly estimated.

Given what we do know, however, we can at least identify higher risk populations and industries to target for prevention measures. We must be proactive as industries and jobs change in our State and vigilant in collecting accurate, timely and meaningful data to better inform our intervention efforts. We will continue to collaborate with our partners and key stakeholders to ensure that resources are invested in occupational health surveillance at the state level.

Outcomes

The majority of our work is focused on highlighting occupational injury or illness by industry and/or occupation. An outcome of analyzing and producing data on a variety of occupational health indicators is the ability to identify priority areas for prevention strategies. Another outcome of these efforts is the development of more comprehensive data sets and dissemination of more accurate and detailed information, including the investigation of injury and illness data by where a person works, what they do for work, and by a variety of demographic and employment parameters (including disability status). This is an important aspect of understanding the true burden of work-related injuries and illnesses, and allows key stakeholders to better prioritize resources.

Our efforts to date have led to meaningful impacts on occupational safety and health surveillance, epidemiology, public health practice and research activities (both national and state-wide). We developed strong relationships with our NIOSH partners, with our public health partners at NH DHHS, and with agencies that allowed us to access data that was previously untapped for occupational health surveillance (for example, the commercial motor vehicle crash data). We developed audience-specific educational materials, outreach, and other resources for optimizing their application among our partners for protecting workers. We informed legislative efforts on topics tied to worker safety and health and well-being.

An important outcome of efforts to partner with other public health programs and organizations is increased awareness of the importance of occupational health in assessing health status of all populations, investigating health problems and health hazards in the community, informing and educating people about these issues, and developing laws and policies that protect health and ensure safety. This results in meeting intermediate goals for stakeholder uptake of program outputs to support policies that incorporate occupational health status/indicators in building evidence for a more inclusive implementation of prevention and health promotion efforts.

Outcomes from collaboration include building awareness and educating various public health groups about the importance of occupational health as an integral part of public health (being a voice on various committees devoted to broader public health issues) and securing resources for collecting important data to help us better understand conditions at work for our most vulnerable populations. A more educated stakeholder population is more successful in implementing prevention strategies and effecting policy change.

Publications

Armenti, K., Antal, P. (2021) Occupational Injury and Illness in New Hampshire Data Report to Inform Programs and Policies, Report, University of New Hampshire, Institute on Disability

Armenti, K., Laflamme, D. (2020). Analysis of New Hampshire Pregnancy Risk Assessment Monitoring System (PRAMS) to Better Understand Breastfeeding Initiation and Duration by Industry Category, Report, University of New Hampshire, Institute on Disability

Contributor; (2020) NH Violence & Injury Prevention Plan 2020-2025, NH Department of Health and Human Services, Injury Prevention Program and Dartmouth-Hitchcock Injury Prevention Center

Armenti, K. (2020). Asthma Prevalence among New Hampshire Workers, Behavioral Risk Factor Surveillance System, 2014-2016, Issue Brief, NH Occupational Health Surveillance Program University of New Hampshire, Institute on Disability

Lauer, E. (2020). 2019 Annual Disability Statistics Compendium, Report, University of New Hampshire, Institute on Disability

Lauer, E.A., Armenti, K., Henning, M., Sirois, L. (February 2019). Research Article: Identifying Barriers and Supports to Breastfeeding in the Workplace Experienced by Mothers in the New Hampshire Special Supplemental Nutrition Program for Women, Infants, and Children Utilizing the Total Worker Health Framework, International Journal of Environmental Research and Public Health, Volume 16, Issue 4, doi:10.3390/ijerph16040529

Armenti, K. (2019). Characteristics of Commercial Motor Vehicle Crashes Reported in the New Hampshire State Police, Commercial Crash Dataset for Years 2015 through 2017, Issue Brief, University of New Hampshire, Institute on Disability

Armenti, K., Simon, K., Lyster, E. (April 2019). Collecting Industry and Occupation Data: A Training Guide for Poison Centers at https://iod.unh.edu/projects/occupational-health-surveillance-program/trainings.

Armenti, K. (2019). Characterization of Lower Blood Lead Levels Reported for New Hampshire Adults from 2014-2016, Issue Brief, Occupational Health Surveillance Program, University of New Hampshire, Institute on Disability

Armenti, K. (2018). Impact of Influenza Policies among New Hampshire Healthcare Personnel, Issue Brief, UNH Institute on Disability, NH Occupational Health Surveillance Program, University of New Hampshire, Institute on Disability

CUMULATIVE ENROLLMENT PLAN

Program Director/Principal Investigator (Last, First, Middle):
Armenti,Karla, R..

Targeted/Planned Enrollment Table

This report format should NOT be used for data collection from study participants.

Study Title: Expansion of the NH Occupational Health Surveillance Program

Total Planned Enrollment: Study used secondary (existing) data so no planned enrollment

TARGETED/PLANNED ENROLLMENT: Number of Subjects			
Ethnic Category	**Females**	**Males**	**Total**
Hispanic or Latino			
Not Hispanic or Latino			
Ethnic Category: Total of All Subjects *			
Racial Categories			
American Indian/Alaska Native			
Asian			
Native Hawaiian or Other Pacific Islander			
Black or African American			
White			
Racial Categories: Total of All Subjects *			

* The “Ethnic Category: Total of All Subjects” must be equal to the “Racial Categories: Total of All Subjects.”

INCLUSION OF WOMEN AND MINORITIES

Women and minorities were included based on their proportions of identified individuals. Inclusion criteria did not target or intentionally exclude any vulnerable populations, minorities, or sub-groups. Inclusion is based purely on existence of records in the research sources.

Race/Ethnicity

Data quality issues include inconsistencies in race/ethnicity data collection by hospital, in particular, differences in the percentages of "unknowns" and additionally, it is standard procedure for hospital admissions personnel to record their perception of a patient's race without asking the patient. While census and death data more accurately record race/ethnicity, it is necessary to use special "bridging" procedures to combine 2000 census data, which allows for multiple race classifications, with death data, which uses an older race classification system that doesn't allow individuals to claim more than one race.

Disability Status

According to the 2019 American Community Survey, 12.9% of the population of New Hampshire are people with disabilities and 87.1% are people without disabilities. Among the people with disabilities, 44.5% were employed and among people with no disabilities 82.8% were employed. Because disability can have a long-term impact on employment and income, surveillance of this population is of utmost importance. Every effort was made to include minorities in our surveillance efforts.

Gender and Age

According to the 2019 American Community Survey, 57.6% of New Hampshire's employed workers in 2019 were male and 42.4% were female. Among the total civilian non-institutional population in 2019, 77.8% of men and 60.7% of women were employed. Every effort was made to include workers of both genders in surveillance projects. In 2019, 38.8% of New Hampshire workers were between the ages of 16 and 19 years of age. Every effort was made to include young workers in our surveillance efforts.

INCLUSION OF CHILDREN

Children ages 16-17, who are employed, were included in data analysis of secondary data sources based on their proportions of identified individuals. Inclusion criteria did not target or intentionally exclude any vulnerable populations, minorities or sub-groups. Inclusion was based purely on occupational injuries and illnesses that are reportable under state and federal regulations.

Materials Available for Other Investigators

Industry and Occupation Data Collection Training

- On-line training module for staff at state or regional poison centers on: Collecting Industry and Occupation Data: A Training Guide for Poison Centers. This can be found at: https://iod.unh.edu/projects/occupational-health-surveillance-program/trainings and on You-Tube at: https://www.youtube.com/watch?v=ECoE8EYB7tc&feature=youtu.be. Cancer Registrars can receive education credits (CEUs) for completing the same training.

Surveys

- Exploration of breastfeeding barriers associated with returning to work among women enrolled in the NH Special Supplemental Nutrition Program for Women, Infants and Children.
- Vaccination rates of healthcare personnel and workplace influenza policies
- Burnout and Occupational Well-Being Survey (BOWS)

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[vi] Azaroff LS, Levenstein C, Wegman DH., (2002). Occupational injury and illness surveillance: conceptual filters explain underreporting. *American Journal of Public Health*, 92(9), 1421--9. doi: 10.2105/ajph.92.9.1421

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[viii] Davis, L, Souza, K., (2009). Integrating Occupational Health into Mainstream Public Health in Massachusetts: An Approach to Intervention, *Public Health Reports*, 124(4, Suppl.) 5-15. doi.org/10.1177/00333549091244S102