

## **Title Page**

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## **List of Terms and Abbreviations**

ABLES - Adult Blood Lead Epidemiology and Surveillance  
AAE - Association of Asthma Educators  
ACBS - Asthma Call-back Survey  
ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers  
ANSI - American National Standards Institute  
APD -All Payer Database  
ASSP – American Society of Safety Professionals  
BLL- Blood Lead Level  
BLS – Bureau of Labor Statistics  
BOHIP - Bureau of Occupational Health and Injury Prevention  
BRFSS – Behavioral Risk Factor Surveillance System  
CDC – Centers for Disease Control  
CHIR – County Health Indicators by Race/Ethnicity  
CLPP – Childhood Lead Prevention Program  
CFOI – Census of Fatal Occupational Injuries  
CODES – Crash Outcome Data Evaluation System  
COPD – Chronic Obstructive Pulmonary Disease  
COSH - Council for Occupational Safety and Health  
COVID-19 – Coronavirus Disease  
CSEA- Civil Service Employees Association  
CSTE – Council of State and Territorial Epidemiologists  
DEC - Department of Environmental Conservation  
DOH – Department of Health  
ED – Emergency Department  
EMS – Emergency Medical Services  
EPHT – Environmental Public Health Tracking  
FACE – Fatality Assessment and Control Evaluation  
FRDM – Focused Relay Dissemination Model  
GOL – Game of Logging  
HIPAA - Health Insurance Portability and Accountability Act  
HMR – Heavy Metals Registry  
HVAC – Heating, Ventilation and Air-Conditioning  
IH – Industrial Hygiene  
IPDM - Intervention Product Development Model  
MMWR –Morbidity and Mortality Weekly Report  
NAICS- North American Industry Classification System  
NEC - Northeast Center for Occupational Health and Safety  
NIOSH – National Institute for Occupational Safety and Health  
NORA – National Occupational Research Agenda  
NPDS – National Poison Data System  
NSSA – National Ski Area Association  
NYC – New York City  
NYCAMH – New York Center for Agricultural Medicine and Health  
NYS – New York State

NYSDOH- New York State Department of Health  
NYVDRS – New York Violent Death Reporting System  
NWRA - National Waste & Recycling Association  
OEHC – Occupational and Environmental Health Center  
OHCN – Occupational Health Clinic Network  
OHI – Occupational Health Indicators  
OLDR – Occupational Lung Disease Registry  
OSHA – Occupational Safety and Health Administration  
PCC – Poison Control Center  
PESH – Public Employees Safety and Health  
PFOA - Perfluorooctanoic Acid  
PHAB - Public Health Accreditation Board  
PPE – Personal Protective Equipment  
PPR – Pesticide Poisoning Registry  
RETAIN - Retaining Employment and Talent after Injury/Illness Network  
SANY – Ski Areas of New York  
SCO -Safety Compliance Officer  
SOP – Standard Operating Procedure  
SPARCS - Statewide Planning and Research Cooperative System  
SUDORS - Statewide Unintentional Drug Overdose Reporting System  
SUNY – State University of New York  
TB -Tuberculosis  
TCIA -Tree Care Industry Association  
TR - Trauma Registry  
US- United States  
WCB – Workers Compensation Board  
WPV – Workplace Violence  
WRA – Work-related Asthma  
eWORLD -Work-Related Lung Disease Surveillance System  
YPLL -year of potential life lost

## **Abstract – Overall Program**

New York State (NYS) is the fourth most populous state, with 19.5 million persons residing on over 47,000 square miles of land. With more than nine million full-time employees in 2018, NYS is also home to a varied workforce. NYS is also home to a diverse workforce. Eighteen percent of NYS workers are of Hispanic origin and 16% are Black, compared to about 17% and 12% respectively, for the US working population as a whole. Because of this diversity, an integrated program is necessary to monitor and understand the occupational health status of New Yorkers, and then to prevent the occurrence of future occupational diseases and injuries. An integrated program is necessary to monitor and understand the occupational health status of New Yorkers, and then to prevent future occurrence of occupational diseases and injuries.

The systematic collection, analysis, interpretation, dissemination and use of health data is essential to understand the health status of a population, to assess progress, and to plan effective prevention programs. Therefore, the NYS Department of Health's (NYSDOH) Bureau of Occupational Health and Injury Prevention used the funds from this grant to expand and improve its current occupational health surveillance programs.

Data from occupational health surveillance was used to influence the 2019-2024 State Prevention Agenda – the blueprint for state and local action to improve the health of New Yorkers. Occupational health, surveillance and intervention has partnered throughout the NYS Department of Health to incorporate occupational health into public health practice. Disparate populations have been reached including workers of low income, undocumented, non-English speakers, and minorities; along with programs affecting infants, teens, and exposed workers. Awareness of prevention for occupational diseases and injuries was increased through NYS, working with other state agencies and localities. The NYS Occupational Health Clinic Network has expanded the ability of the Health Department to improve protections, awareness, and understanding of occupational diseases.

## **Final Scientific Report – Overall Program**

### Findings

1) Stakeholders have been instrumental in raising awareness of and disseminating worker health and safety information throughout the state.

Partnerships have enabled occupational health, surveillance and intervention to be incorporated into public health practice throughout the NYS Department of Health and through the local health departments located in 57 counties and New York City. Disparate populations including workers of low income, essential frontline workers, undocumented workers, non-English speakers, and minority workers have been reached. Collaboration with the Clinics has allowed for educational opportunities raising awareness among workers, employers, health care providers, and legislators.

2) Materials that increase the awareness of prevention strategies for occupational diseases and injuries have been developed, disseminated and evaluated.

Much work has been conducted regarding raising awareness of occupational exposures among workers, with special emphasis on workplace fatalities, recognition of occupational lung disease and increasing awareness about lead exposure during pregnancy. Social media marketing strategies get occupational health and safety prevention information to both workers and the decision makers who need to be convinced of the need for change. Digital media has proven successful in delivering information to the high-risk populations. NYSDOH webpages were revised to ensure that prevention messages were appropriate and easy to understand. These social media posts help in identifying successful prevention efforts in health communications, which are transferable to different workplace settings as well. Oversight of the NYS Occupational Health Clinic Network has aided in the recognition, diagnosis and treatment of occupational diseases.

### Translation of Findings

- 1) Occupational health and safety programs can utilize the methods for sharing data and utilizing partnerships to increase awareness of occupational health and safety issues within their states.
- 2) Occupational health and safety programs should work with programs within their agencies to incorporate occupational health into public health practice, and to utilize existing partnerships to raise awareness and share information.
- 3) Programs should recognize that partnerships need to be exclusively associated with occupational health and safety ideology. Instead, existing boards, task forces, councils, committees, work groups and projects have already brought interested parties to the table.
- 4) Outreach and intervention directed to high risk and vulnerable populations often require a team approach to identify how to reach the population of interest and gain their trust. Utilizing multidisciplinary partners can help develop and evaluate health communications.

### Intermediate Outcomes

- Occupational health data describing patients seen by the NYS Occupational Health Clinics have been shared through the NYSDOH website.
- An update of the Occupational Health Clinic Network report was completed to include data from 2006-2015.

- Occupational health data continue to guide the NYS Prevention Agenda, Healthy Environment Workplace Injury Objectives.
- Provide oversight to nine occupational health clinics that aid in the recognition, diagnosis, treatment and prevention of occupational diseases. The clinic sees on average, more than 8,500 patients with more than 12,500 visits each year.
- Quarterly meetings with the Occupational Health Clinic Network serve to review ongoing or new issues of interest or concern among workers in NYS.
- Access was gained to new databases including the NYS Syndromic Surveillance System, New York Crash Outcome and Data Evaluation System (CODES), and the Statewide Unintentional Drug Overdose Reporting System (SUDORS), allowing for further description of the burden of occupational injuries and diseases in NYS.
- The brochure, “Advice for In-home Contractors” was developed to provide in-home workers with methods to work safely around COVID-19 (Coronavirus Disease). A social media campaign, that utilized demographic, behavioral, and geo-targeting to reach target audiences through Facebook, LinkedIn, Instagram and google traffic ads drove to the brochure to generate awareness about workplace safety in the midst of the pandemic.
- Findings from the New York Behavioral Risk Factor Surveillance System (BRFSS) were published in a report to the NYSDOH webpage. The report explores industry and occupational data from the NYS BRFSS including an analysis of fifteen health access, behaviors and outcomes indicators by industry and occupation.

### Background

Occupational illnesses and injuries encompass a wide variety of diverse health conditions including cancers, musculoskeletal disorders, respiratory impairment, and poisonings. In 2018, there were 2.8 million injuries and illnesses in private industry workplaces in the United States (US) reported to the US Department of Labor, Bureau of Labor Statistics (BLS), of which 1.2 million required days away from work.<sup>1</sup> In 2018, the BLS annual survey reported over 200,000 injuries and illnesses in NYS, of which 107,440 required days away from work.<sup>2</sup> The highest incidence rates of non-fatal occupational injuries and illnesses in NYS occur among government employees (primarily fire protection, police protection, highway and street construction, and health services), and workers in agriculture, construction, transportation, and manufacturing industries.<sup>2</sup> In NYS, 271 workers died of traumatic injuries on the job in 2018.<sup>3</sup>

In the US in 2018, occupational injuries were estimated to cost roughly 171 billion dollars, based on current surveillance data which likely underestimate the incidence of injuries.<sup>4</sup> Work-related injury and illness medical costs contribute substantially to overall health care costs in NYS. During the 3-year period 2016–2018 in NYS, hospitalizations and emergency department (ED) visit total gross charges for work-related injuries and illnesses amounted to over \$3.7 billion. Work-related MSDs and injuries were the most common and most expensive diagnoses requiring hospitalization or ED visit. Gross hospitalization and ED charges have been on a steady rise. Many work-related injuries and illnesses are preventable and substantial savings in overall health care costs could result from successful prevention measures.

Surveillance is “the ongoing, systematic collection, analysis and interpretation of data essential to the planning, implementation, and evaluation of public health practice, closely integrated with

the timely dissemination of these data to those responsible for prevention and control.”<sup>5</sup> Surveillance is a necessary component to guide action in preventing workplace injuries and illnesses and an ideal surveillance system will be able to estimate the magnitude of a problem; identify high-risk populations; monitor time and geographic trends; identify cases, worksites and industries for follow-up; and identify new diseases and hazardous exposures. This data will then be disseminated to those responsible for prevention and control in a timely manner.<sup>6</sup> State-based surveillance systems provide a vital foundation for federal surveillance systems and assist in augmenting those systems.<sup>7</sup>

Occupational health surveillance is hampered by problems with disease recognition and reporting.<sup>3,8</sup> In order to appropriately diagnose a work-related illness, the relationship to work must be suspected which requires awareness by either the worker or physician. However, many employers do not provide safety training, and physicians may only receive a few hours of training in occupational health when in medical school. Unfortunately, lack of an appropriate diagnosis can delay early treatment and potentially hinder full recovery, possibly resulting in disability and/or inability to return to work. Health care providers are also reluctant to report cases to surveillance systems for a variety of reasons including dislike of paperwork, lack of time, unawareness of reporting requirements, and fear of discrimination toward their patient.<sup>8</sup>

There is no one complete source of information on the extent of occupational disease and injury in NYS. Data sources for occupational diseases and injuries include all data sources utilized by the Occupational Health Indicators (OHIs)<sup>99</sup> including the BLS industry surveys and the Census of Fatal Occupational Injuries (CFOI), hospitalization and ED data using Workers’ Compensation as a primary payer, disease registries and vital statistics maintained by the NYSDOH, and Workers’ Compensation data. Although each data source has its limitations, each can assist in providing a more complete picture of the health status of New Yorkers.

Because NYS is so large and diverse, there is a wide spectrum of occupational fatalities, injuries and diseases. It is often useful, for purposes of analysis, to divide the state into two regions: upstate (all regions of the State excluding the five boroughs of the City) and New York City (NYC). Compared to the US population, workers in NYC are at very high risk for fatalities in construction, wholesale and retail trade, information, and public administration; while workers in upstate NY are at increased risk for fatalities in agriculture and forestry, education and health services, leisure and hospitality services, and public administration.<sup>2</sup>

NYSDOH recognizes that occupational health is an important component of overall public health. The NYSDOH, the Bureau of Occupational Health and Injury Prevention (BOHIP) has over 35 years of experience in occupational health surveillance, research, and intervention. BOHIP is responsible for implementing occupational health surveillance projects following the guidelines for comprehensive state-based occupational health activities.<sup>16</sup> BOHIP has a long history and a strong ongoing investment in the use of surveillance data in support of occupational health epidemiology in the public health arena and have expertise in targeting interventions identified through the surveillance activities. Data collected through the various registries and programs maintained by the Bureau facilitate in-depth data analysis, intervention and prevention activities designed to improve workers’ health and safety; evaluation of these efforts has increased the effectiveness of these programs which have, in the past, served as models for other

states. For example, the Heavy Metals Registry (HMR) was established in 1980 (perhaps the first in the nation) and occupational lead poisoning data from this registry were reported to National Institute for Occupational Safety and Health (NIOSH) as early as 1985. These data were used to support development of national occupational lead surveillance recommendations and standards.

The structure of BOHIP creates the institutional strength required for full implementation of a complete surveillance system for occupational health and safety. A surveillance system requires an integrated approach using staff with skills in epidemiology, industrial hygiene, data analysis and health education. It is necessary for all systems to interact with each other to ensure that identified cases receive appropriate follow-up.

NYSDOH oversees the Heavy Metals Registry, and the Occupational Lung Disease Registry (OLDR), which are case-based surveillance and intervention systems. These case-based registries are primarily based on the Sentinel Event Notification system of Occupational Risk model utilizing case reports to identify emerging hazards and high-risk populations. For each registry, once information is received on a patient, staff contact individuals and/or their physicians to determine the possible sources of exposure, to provide advice on appropriate control measures to limit future exposures to the individual and his/her family, and to answer any questions the case may have. For situations where an employer had not previously been reported to the Registry, an industrial hygienist contacts the company to determine the exposure circumstances.

The NYSDOH BOHIP staff make recommendations to reduce exposures whenever warranted and feasible. While NYSDOH does not have the regulatory authority to enforce Occupational Safety and Health Administration (OSHA) standards, NYSDOH consider applicable OSHA standards as well as emerging scientific information as a baseline when recommending that employers institute protective measures which include medical and industrial hygiene monitoring, worker training, engineering and work practice controls, and personal protective measures to reduce worker exposures.

NYSDOH oversees the nation's only state-based occupational health clinic network. The network includes eight regionally based Clinics along with an agricultural medicine clinic. Each Clinic is run independently with partial funding from the State. Each Clinic is run independently with partial funding from the State. The Clinics are mandated to: provide objective diagnosis of suspected work-related medical problems; conduct medical screenings for groups of workers who are at increased risk of occupational illness; make referrals for treatment to other medical specialists, if necessary; perform industrial hygiene evaluation of workplaces of concern; and provide education and prevention programs.

The Clinics are a resource for health care providers treating patients with potential work-related illnesses and injuries, including COVID-19. The clinic network is available for consultation or referral of patients. They have diverse treatment teams of physicians, nurses, industrial hygienists, and social workers that assist providers in the management of their patients' work-related conditions and, if necessary, provide worksite and social work interventions. They are advocates for worker health, assisting in union outreach programs and labor/ management cooperative initiatives. The OHCN's board certified occupational medicine physicians and staff

are experts in dealing with the NYS Workers' Compensation system and assisting patients during the compensation process. Employers, workers, government agencies, unions, health professionals, and community organizations can use the Clinics' expertise. The Statewide network allows for sharing of information, and assistance with the development and application of standardized medical assessment protocols.

**Aim 1.** To comprehensively address all aspects of worker health in order to improve the culture of worker health and safety by integrating occupational health into public health practice.

## **Methodology**

Occupational health, surveillance and intervention has partnered throughout the NYS Department of Health to incorporate occupational health into public health practice. Disparate populations have been reached including workers of low income, undocumented, non-English speakers, and minorities; along with programs affecting infants, teens, and exposed workers. Awareness of prevention for occupational diseases and injuries was increased through NYS, working with other state agencies and localities. The NYS OHCN has expanded the ability of the Health Department to improve protections, awareness, and understanding of occupational diseases.

NYSDOH is committed to improving worker health and safety. The Prevention Agenda 2019-2024 is New York State's health improvement plan, the blueprint for state and local action to improve the health and well-being of all New Yorkers and to promote health equity in all populations who experience disparities. In partnership with more than 100 organizations across the state, the Prevention Agenda is updated by the NYS Public Health and Health Planning Council at the request of the DOH. This is the third cycle for this statewide initiative that started in 2008. To "Promote a Healthy and Safe Environment" is one of five priority action plans, and within this action plan, injuries and occupational health are one of the four focus areas.

## **Results/Accomplishments**

- Occupational health indicator data were used to help develop the NYS Prevention Agenda, Healthy Environment Workplace Injury Objectives. The NYS Prevention Agenda was developed as a call to action to local health departments, health care providers, health plans, schools, employers and businesses to collaborate at the community level to improve the health status of New Yorkers through increased emphasis on prevention. A goal of reducing occupational injuries and illnesses was incorporated with the following objectives:
  - Reduce disparities in work-related emergency department visits.
    - Reduce the ratio of the rate of black non-Hispanics to white non-Hispanics from 1.45 per 10,000 to 1.3 per 10,000 workers.
    - Reduce the ratio of the rate of Hispanics to white non-Hispanics from 0.93 per 10,000 to 1.0 per 10,000 workers.
  - Reduce disparities in work-related hospitalizations.
    - Reduce the ratio of the rate of black non-Hispanics to white non-Hispanics from 1.10 per 10,000 to 1.0 per 10,000 workers.
  - Reduce the ratio of the rate of Hispanics to white non-Hispanics from 0.95 per 10,000 to 1.0 per 10,000 workers.

- Reduce the rate of emergency room visits for occupational injuries among adolescents 15-19 years of age from 21.32 to 19.20 per 10,000 workers.
- A NYS Prevention Agenda Dashboard has been created displaying an interactive visual presentation to monitor progress of those objectives that were selected as indicators. Data was provided to the dashboard on the rate of work-related emergency department visits and ratio of rates between Black non-Hispanics and White non-Hispanics, by region and county, in comparison to the prevention agenda goal. New York State is significantly worsened for this goal.  
[https://webb11.health.ny.gov/SASStoredProcess/guest?\\_program=/EBI/PHIG/apps/dashboard/pa\\_dashboard&p=sh](https://webb11.health.ny.gov/SASStoredProcess/guest?_program=/EBI/PHIG/apps/dashboard/pa_dashboard&p=sh).
- Staff continues to oversee and support the clinics in the NYS OHCN which aid in the recognition, diagnosis and treatment of occupational diseases. The clinic network sees on average, more than 8,600 patients with over 12,600 visits each year.
- The NYS OHCN patient database has been analyzed. A ten-year update (2006 -2015) to the original report from 1988-2003 has been posted on the NYSDOH web site.
- NYSDOH staff continue to review the Needs Assessments from each of the nine OHCN clinics. As a requirement of their funding, each clinic is required to submit to the NYSDOH, a mid-funding cycle needs assessment that describes their catchment area including population and workforce, the occupational hazards in the region and a plan for reaching the identified exposed workers. These Needs Assessments provide an in-depth look into the specific occupational health hazards throughout the state.
- Staff has participated in the Department of Health’s national reaccreditation process through the Public Health Accreditation Board (PHAB). The reaccreditation process works to improve and protect public health by setting standards to advance the quality and performance of the nation’s tribal, state, local and territorial public health departments. Staff joined teams which focused on two domains of the process; Domain 1, ‘Conduct and Disseminate Assessments Focused on Population Health Status and Public Health Issues Facing the Community’, and Domain 10, ‘Evidence-based Practice’.
- Industry and occupation were coded for all 2015 and 2016 NYVDRS cases. Analyses are being conducted to identify high risk occupations and industries for suicides and homicides. This data was prepared for display on the NYS Health Connector suicide prevention dashboard: <https://nyshc.health.ny.gov/web/nyapd/suicides-in-new-york>
- Summary statistics on agricultural vehicle crashes that occurred during 2010-2012, recorded in the NYS CODES, was shared with the New York Center for Agricultural Medicine and Health.
- The Community Health Indicator Report Data continues to be updated annually. This includes data on fatal work-related injuries, pneumoconiosis, asbestosis, work-related hospitalizations and elevated blood lead levels (10+) by county. Fatal work-related injuries are also mapped.
- Deidentified data on industry, occupation, diagnoses and exposure from the NYS OHCN will be shared on Open Data New York (<https://data.ny.gov/>). Data was shared and a draft webpage was created, although the project was put on hold due to the COVID-19 pandemic.
- Staff have participated on the NYSDOH Exploited Worker Task Force, identifying activities and legislation that are appropriate for NYSDOH to protect low income, immigrant populations in the occupational settings.

- Staff collaborated with staff from the Healthy Homes Pilot Project. Household injury and occupational issues were discussed to determine what injury prevention information and strategies could be incorporated into home visits.
- Staff have participated on the Traumatic Brain Injury Coordinating Council and the Concussion Initiative Advisory Committee to ensure appropriate prevention and treatment information is provided to the public.
- Staff have also participated in the Young Workers Safety Group, the September 11<sup>th</sup> Worker Protection Task Force and Prescription Drug Overdose Prevention group.
- An injury surveillance work outline was developed in collaboration with Injury Prevention staff. The outline includes the identification of currently used injury datasets including CFOI and Fatality Assessment and Control (FACE) data and identified additional sources of data for the state's injury prevention program. The document also lays out goals for future data analysis and underscores the opportunities for research and enhanced surveillance efficiency/effectiveness that could be further obtained by integrating injury and occupational surveillance activities.
- Industrial hygiene staff have assisted the NYSDOH's Occupational Health and Safety program and Emergency Preparedness program in the development of worker protection forms.
- Industrial Hygiene staff continue to assist on controlling workplace outbreaks and infections including:
  - Assisting a hospital in identifying the sources and pathways related to ongoing aspergillus infections in patients admitted through the Emergency Department. Recommendations were made to improve environmental infrastructure, infection control policies, and containment practices for repair and construction activities. All recommendations were implemented within two weeks of the consult.
  - Assisting a hospital in the reviewing of their new operating room ventilation system to ensure they were designed and working appropriately to avoid contaminants to both patients and medical personnel.
  - Assisting with identifying potential tuberculosis transmission from an inmate to staff and other inmates at a correctional facility.
  - Assisting a county health department in the design and installation of two tuberculosis (TB) isolation rooms at their outpatient chest clinic. Staff also assisted with revisions to the clinic's TB control policies, as well as the development of a maintenance and monitoring program for the isolation rooms.
  - Assisting with the development of a worker protection program for county and state health department staff who participate in the ongoing monitoring of all building cooling towers in NYS for legionella.
  - Participating in an environmental evaluation of a Post Office in conjunction with a tuberculosis contact investigation. The evaluation consisted of a visual assessment of the mail sorting area as well as a qualitative characterization of indoor airflow patterns using a visible smoke tracer. Findings were used to select primary contacts for follow-up evaluation.
  - Assisting local and state TB staff to identify worker and inmate contacts to an inmate who had been symptomatic with tuberculosis disease for several months after intake. Staff evaluated floor plans, heating, ventilation and air conditioning blueprints, and

- clinical and epidemiologic data regarding the various areas of the facility where the inmate was housed, worked, recreated, and attended classes. Findings were used to select primary contacts for follow-up evaluation.
- Industrial hygiene staff has been extensively involved in helping mitigate the spread of COVID-19 among essential workers and all residents of NYS. This includes working with NYS Emergency Preparedness staff to conduct quality control inspection of donated and procured PPE throughout the State and tracking, itemizing and collecting different types of PPE for testing. The donations were distributed to Emergency Operations Command for COVID-19 testing staff, emergency preparedness and first responder staff and health-care workers. Industrial hygiene staff also assisted NYS Office of General Services warehouse staff in providing general training on PPE, assessment guidance, and assessments of textile and material composition to upgrade inventory system to achieve a common reference language among all groups involved in the PPE acquisition and distribution.
  - Assisted in ventilation assessments of nursing home systems and provided guidance to Infection Control staff for decontamination and reuse of N95-respirators in hospitals and nursing homes during the COVID-19 pandemic.
  - Assisted infection control and medical staff in establishing HVAC strategies consistent with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) ventilation and OSHA during the COVID-19 pandemic.
  - Guidance for the re-opening of dental offices and PPE requirements for the performance of aerosol-generating procedures was provided. In addition, industrial hygiene staff assisted in the development of a ventilation checklist consistent with ASHRAE guidance for visiting dental clinics at schools.
  - Industrial hygiene staff also contributed to NYSDOH guidance documents on alternative systems for disinfection of buildings including UV-C, far UV, electrostatic spraying, and ozonation as well as mall reopening guidance for ventilation systems and compliance with ASHRAE and NYS ventilation requirements.
  - BOHIP staff has contributed to reopening guidance after the “NYS PAUSE” was lifted during the COVID-19 pandemic for workers including:
    - Migrant farmworkers
    - Essential In-home contractors
    - Beauty salons and barbershops
    - Tattoo parlors
    - Spas and hydrotherapy
    - Construction jobsites
    - Warehousing and fulfillment, shipping and trucking workers
    - Spill clean-up workers for NYS Department of Environmental Conservation.
    - Movie theaters and gyms
  - BOHIP staff was also involved in the development of COVID-19 guidelines for in-home contractor work and collaborated to develop a brochure, “Advice for In-home Contractors” to specifically target plumbers, electricians, carpenters, appliance repair, cable, and phone technicians to provide them with steps to reduce their exposure to COVID-19 on the job. The brochure, which was also translated into Spanish, was published on our webpage.

## **Discussion/Conclusion**

Oversight of the NYS OHCN has aided in the recognition, diagnosis and treatment of occupational diseases. Collaboration with the Clinics has allowed for educational opportunities raising awareness among workers, employers, health care providers, and legislators.

The increased awareness of occupational health issues has allowed for a statewide approach to protecting vulnerable workers.

**AIM 2.** To identify and utilize stakeholders to raise awareness of worker health and safety in NYS, and to assist in expanding dissemination of surveillance information.

### **Methodology**

BOHIP has continued to identify and analyze data that may assist other NYSDOH programs along with external stakeholders. Information has been routinely disseminated through the Injury Prevention listserv, through the NYSDOH webpages and through the OHCN listserv and meetings. BOHIP staff participates on various task forces and workgroups to ensure occupational health issues are appropriately addressed.

### **Results/Accomplishments**

- Staff continues to attend OHCN advisory boards which meet every quarter. Topics of common interest to the clinics are identified, then either shared with other advisory boards when appropriate, or brought back to NYSDOH so a statewide approach can be developed to address them. Information developed by NYSDOH is shared with them as well.
- Staff explored data from the NYS OHCN to describe the demographic and clinical characteristics of injured low wage workers who were seen at these clinics, as well as differences in etiologic agents by occupation. The impact of injury/illness and return to work rates were also compared with those of higher earners. Findings were presented at a National Conference and at one of the quarterly NYS OHCN meetings.
- BOHIP staff, along with representatives from the OHCN, met with the Commissioner of the NYS Workers' Compensation Board (WCB) and other WCB staff. The conversation revolved around the history of the OHCN, objectives, challenges, and accomplishments of the Network over the years. The WCB described the work they have done to improve the timing of responses of cases, expansion of providers and overall efficiency of the process, and their commitment to the increase of provider participation and injured workers' access to quality medical care. Since the initial meeting WCB staff have attended all of the OHCN quarterly meetings to continue to grow the relationship between the WCB and OHCN.
- BOHIP continues to support the annual addition of questions on industry and occupation into the NYS BRFSS questionnaire. These findings have been published in a report that explores industry and occupational data including an analysis of fifteen health access, behaviors and outcomes indicators by industry and occupation.
- In response to potential environmental and workplace issues, we continue to run social media posts that target New York workers. For example, in anticipation of extreme cold weather, a NYDOH Facebook post was run to make workers aware of the potential hazards of carbon monoxide gas exposures at their work sites.
- Information on occupational health surveillance has been presented to students as part of the Methods in Injury Epidemiology and Prevention course at the Columbia University Mailman

School of Public Health and to doctoral students and faculty at the New York Medical college.

- Although the meeting was postponed in 2020 and 2021 due to the ongoing COVID-19 pandemic, staff actively participates in the planning of the Northeast Regional Occupational Health Surveillance meeting which is held annually. The meeting is held annually in May in Connecticut and representatives from occupational health and epidemiology departments of Northeast states share experiences and best practices related to occupational disease and injury surveillance. The information is used to plan activities to improve occupational health and safety in New York State, increase knowledge on emerging issues, and increase regional collaboration.
- Surveillance staff continue to mentor graduate school students when feasible, to give experience and help develop their proficiency in public health practice. Five graduate students had internships in the Bureau during the funding cycle.

### **Discussion/Conclusion**

Occupational health, surveillance and intervention has partnered throughout the NYSDOH to incorporate occupational health into public health practice. Disparate populations have been reached including workers of low income, undocumented, non-English speakers, minorities and essential workers. Awareness of prevention for occupational diseases and injuries was increased through NYS, working with other state agencies and localities. The NYS OHCN has expanded the ability of the Health Department to improve protections, awareness, and understanding of occupational diseases.

Occupational health surveillance was used to influence the Prevention Agenda 2019-2024— the blueprint for state and local action to improve the health of New Yorkers. A goal to reduce occupational injury and illness in NYS in disparate populations was incorporated.

**AIM 3.** To develop and disseminate materials that will increase both awareness of and prevention strategies for occupational diseases and injuries, among workers, employers and health care providers in NYS.

### **Methodology**

BOHIP worked with the internal and external partners to explore methods of reaching low-income, minority, immigrant, frontline essential workers and other high-risk populations to disseminate occupational health information among these hard-to-reach groups.

### **Results/Accomplishments**

- Staff meet quarterly with the OHCN to review issues of interest or concern. Topics include collaboration with the NYS Workers Compensation Board, data usage issues, medical provider referrals to occupational health clinics, perfluorooctanoic acid (PFOA) exposure, opioid prescribing guidelines as recommended by the NYS WCB and the NYSDOH in conjunction with Centers for Disease Control (CDC) guidelines, Reducing Exposure to Toxic Cleaning Chemical Products Among Low Wage Immigrant Latino Community Members, The Role of Social Work in the OHCN, Prevention of Silicosis: Countertop Fabrication, outreach efforts and methods to raise awareness of the OHCN, and their response to the COVID-19 pandemic.

- Staff conduct monthly conference calls with the industrial hygienists of the OHCN to discuss on-going issues and topics of interest. The purpose of the calls is to have discussions regarding ongoing work, technical issues in the field and any hot topics of interest. Because of the unique nature of industrial hygiene work, it is useful to share expertise and best practices. Content of the discussion included: work with the Amish, use of social marketing among at-risk communities, chemical substitutions, hearing conservation, bioaerosol and diacetyl chemical assessments in composting facilities, respiratory exposures for manganese welding and silicosis exposure in countertop fabricators.
- Staff has participated in workgroups with the Governor’s Traffic Safety Committee, the National Safety Council Northeast Regional Health and Safety committee, the Northeast Occupational Network planning committee, NYS Nail Salon Industry Enforcement Task Force, the Traumatic Brain Injury Coordinating Council, Traffic Incident Management team, Young Workers Safety Group, the September 11<sup>th</sup> Worker Protection Task Force, the OHCN Oversight Committee, Prescription Drug Overdose Prevention group , Suicide Prevention Council, and with climate change surveillance programs, to explore areas of collaboration and incorporate occupational health and safety practices into other arenas..
- Staff participated with the State University of New York (SUNY) at Albany School of Public Health on the dissertation committee for a doctoral student examining surveillance methodology for injuries in the agriculture and forestry industries. Staff also assisted the SUNY at Albany School of Public Health with recruitment for an Assistant Professor in Occupational Health.
- NYSDOH participates in Occupational Health Awareness and Education week - a weeklong event in NYS highlighting occupational health and safety issues, centered around Workers Memorial Day.
- Staff is working with Outreach and Education to finalize a new NYS OHCN brochure for Health Care Providers. The brochure provides health care providers with information on what the OHCN can offer them and their patients in terms of consultation and diagnosis of work-related disease. The brochure will be posted on the NYS OHCN webpage.
- The surveillance program worked with internal partners to conduct a digital and social media campaign directing viewers to the brochure, “Advice for In-home Contractors” regarding COVID-19 guidelines to help workers reduce their exposures on the job. The campaign targeted adult New Yorkers within specific contractor fields as well as a broader audience, representing people with interests in general contracting/sub-contracting. The campaign ran across Facebook and Instagram and traffic ads and ran for a total of 10 days in June 2020 and again in May and June 2021. Paid media placements drove nearly 12.8 impressions and more than 25,000 clicks to the site. The campaigns reached approximately 89,000 target adults.

### **Discussion/Conclusion**

Further work and effort need to be directed in this area; however, success has been gained in outreach and intervention efforts directed to high-risk and vulnerable populations utilizing partnerships. Social marketing strategies are helping to get occupational health and safety prevention information to both workers and the decision makers who need to be convinced of the need for change. We will continue to utilize our multidisciplinary partners to help develop and evaluate our health communications. These social marketing strategies help in identifying successful prevention efforts in health communications transferable to different workplace settings as well as creative and innovative products. Directed social media campaigns that

identify and direct audiences to the educational materials on the NYSDOH webpages allow us to substantially increase the visibility of our materials to targeted communities. These campaigns have generated millions of impressions and driven tens of thousands of clicks-through to the educational resources on our webpages. Staff continue to explore opportunities, primarily working with other NYSDOH programs that have more direct access to high-risk workers.

### **Products Developed**

- NYSDOH. Safe Patient Handling Workgroup. Report to the Commissioner of Health. [http://www.health.ny.gov/statistics/safe\\_patient\\_handling/docs/sph\\_report.pdf](http://www.health.ny.gov/statistics/safe_patient_handling/docs/sph_report.pdf)
- NYSDOH. New York State Worker Health Chartbook – Findings from the New York Behavioral Risk Factor Surveillance System (BRFSS) available at: [https://www.health.ny.gov/environmental/workplace/occupational\\_health\\_surveillance/](https://www.health.ny.gov/environmental/workplace/occupational_health_surveillance/) and <https://www.health.ny.gov/statistics/brfss/reports/>
- NYSDOH. New York State Occupational Health Clinic Network Report – Key Updates 2006-2015. [https://www.health.ny.gov/environmental/workplace/occupational\\_health\\_clinic/clinic\\_report/clinic\\_report\\_2006-2015.htm](https://www.health.ny.gov/environmental/workplace/occupational_health_clinic/clinic_report/clinic_report_2006-2015.htm).

### **Presentations**

- Bureau of Occupational Health and Injury Prevention. Environmental Health Directors Meeting, October 2014, Cortland, NY.
- Occupational Health Surveillance. Environmental and Occupational Epidemiology Course, at SUNY Albany School of Public Health, March 2015, Rensselaer, NY.
- Occupational Disease Surveillance and Follow-up. Prevent Block Advisory Council. December 2015, Albany NY.
- Applied Examples of State DOH Injury Surveillance Systems. Columbia University Mailman School of Public Health, Methods in Injury Epidemiology and Prevention. March 2016, New York, NY.
- Use of Facebook Advertising to Direct a Targeted Audience to Educational Webpages on Reducing Poisonings from Flea and Tick Control Treatments (poster). Council of State and Territorial Epidemiologists, June 2016, Anchorage AK
- Prevalence of Select Health-Risk Behaviors Among Employed Adults in New York State by Occupation and Industry, 2013-2016. 2018 CDC Behavioral Risk Factor Surveillance System (BRFSS) Training Workshop, April 2018, Atlanta GA.
- New York State Update 2018 – Bureau of Occupational Health and Injury Prevention. 2018 Northeast Occupational Health Network Conference, April 2018, Chester, CT.
- Characteristics of Injured Low Wage Workers Seen at the New York State Occupational Health Clinic Network, 2014-2016. 2018 Council of State and Territorial Epidemiologists Annual Conference, June 2018, West Palm Beach FL.
- Characteristics of Injured Low Wage Workers Seen at the New York State Occupational Health Clinic Network, 2014-2017. New York State quarterly Occupational Health Clinic Network meeting, Albany NY, December 2018.
- Confined Spaces, a webinar for the Winter 2019 Basic Environmental Health Program (BEHP) at the School of Public Health. March 2019, East Greenbush, NY.

- Characteristics of Injured Low Wage Workers Seen at the New York State Occupational Health Clinic Network, 2014-2017. NYSODH, Center for Environmental Health, Division of Environmental Health Assessment Division Rounds, Albany NY, April 2019.
- New York State Update 2019 – Bureau of Occupational Health and Injury Prevention. 2019 Northeast Occupational Health Network Conference, April 2019, Chester, CT.
- Using Social Media to Create Awareness of Workplace Hazards in New York State. NIOSH Surveillance Coordination Group. January 2020.
- Using Social Media to Create Awareness of Workplace Hazards in New York State. Council of State and Territorial Epidemiologists Annual Conference, June 2021.

### **Fact Sheets**

- NYSDOH. Advice for In-Home Contractors; In-home workers such as plumbers, electricians. Carpenter, appliance repair, cable and phone technicians can take steps to reduce risks of COVID-19 when on the job. <https://health.ny.gov/publications/6730.pdf>. Also available in Spanish at <https://www.health.ny.gov/publications/6731.pdf>.

## **Abstract –Occupational Health Indicators**

New York State is the fourth most populous state, with 19.5 million persons residing on over 47,000 square miles of land. With more than nine million full-time employees in 2018, NYS is also home to a varied workforce. NYS is also home to a diverse workforce. Eighteen percent of NYS workers are of Hispanic origin and 16% are Black, compared to about 17% and 12% respectively, for the US working population as a whole. Because of this diversity, an integrated program is necessary to monitor and understand the occupational health status of New Yorkers, and then to prevent the occurrence of future occupational diseases and injuries. An integrated program is necessary to monitor and understand the occupational health status of New Yorkers, and then to prevent future occurrence of occupational diseases and injuries.

The systematic collection, analysis, interpretation, dissemination and use of health data is essential to understand the health status of a population, to assess progress, and to plan effective prevention programs. There is no one complete source of information on the extent of occupational disease and injury in NYS. Data sources for occupational diseases and injuries include all data sources utilized by the OHIs<sup>9</sup> including the BLS industry surveys and the CFOI, hospitalization and ED data using Workers' Compensation as a primary payer, disease registries and vital statistics maintained by the NYSDOH, and Workers' Compensation data. Although each data source has its limitations, each can assist in providing a more complete picture of the health status of New Yorkers.

NYSDOH has effectively collected and publicized all occupational health indicators and has have been involved in identifying and testing new indicators since they were originally developed. Staff participate on national indicator workgroups and have used their expertise to provide guidance and technical assistance on many of the indicators. The data generated are being used to inform communities, occupational health clinics, and local health departments by sharing the data with and through other NYSDOH programs. The data has also been reviewed over time to assist in better understanding trends and issues occurring in New York State. NYSDOH has also added state-specific indicators using data sources unique or available within NYS. Information from the OHIs was used to influence the 2013-2017 State Prevention Agenda.

### **Significant Findings**

1)The Occupational Health Indicators have been a successful tool in developing partnerships and informing communities, occupational health clinics, local health departments, and governmental agencies about occupational health issues within the state.

The Occupational Health Indicators and other occupational injury and illness surveillance reports have created an opportunity for increased communication with the NYS WCB, NYS OHCN and local health departments and have allowed for an increased sharing of data within the NYS Department of Health. The data sharing has allowed for an increased discussion of prevention efforts within the agency and with external partners and to improve the culture of worker health within the state. The data have been posted in multiple locations on the NYSDOH web site, increasing awareness of occupational health issues through other programs.

2) The indicators allow BOHIP to engage in broad-based surveillance that compliments the focused surveillance efforts associated with each of our Registries, fatality program and the work

of our OHCN. BOHIP uses the indicator data to identify potentially high-risk occupational disease patterns in NYS, especially in comparison to other states and the US and where possible by geographic region (NYC and NYS excluding NYC) and county.

3) Data from other health databases such as the Poison Control Center, NYS Electronic Syndromic Surveillance System, CODES and NYS Trauma Center Data can help us improve surveillance of at risk and underserved populations such as low wage-high risk workers. Data from other NYSDOH databases can enhance current surveillance efforts and help give a better understanding of those at risk for work-related injuries and illnesses.

### **Intermediate Outcomes**

- Occupational Health Indicators were provided to CSTE and NIOSH.
  - A subset has been calculated at the county level and has been shared with many other DOH programs for posting on their web pages.
- Staff continue to provide technical assistance on five of the indicators; OHI #2- work-related hospitalizations, OHI #6-work-related hospitalized burns, OHI #9- pneumoconiosis and OHI #22- work-related severe traumatic injury hospitalizations and the work-related asthma indicator (OHI #21).
- The full New York State Occupational Health Indicator dataset, 2000-2015, has been posted to the Environmental Public Health Tracking (EPHT) program webpage along with a subset of those indicators calculated at the county level, asbestosis related hospitalizations, elevated blood lead levels (10 ug/dL and higher and 25 ug/dL and higher), malignant mesothelioma, pneumoconiosis related hospitalizations and work-related hospitalizations.
- Occupational Health Indicator Reports including the NYS worker profile, elevated blood lead levels, work-related hospitalizations, and work-related emergency department visits have been published internally on our NYSDOH Occupational Health Surveillance webpage.
- Occupational health data describing young workers treated in emergency departments, and patients seen by the NYS OHCN have been shared through publications and the NYSDOH website.
- Data has been analyzed to better identify the characteristics of workers in NYS that are more at-risk for experiencing burns at their workplace. These analyses include hospitalization and emergency department data as well as Worker's Compensation claims. The data has been summarized in a report and tables and figures from the analyses will also be shared on the NYSDOH OHI webpage. The updates from this project have been put on hold because of the COVID-19 pandemic.
- Data from 2011-2019 is being examined by county and by cause and nature of death to develop specific fatality occupational health indicators and assist in identification of injury prevention strategies. The data will be shared on the NYS OHI webpage once finalized.
- The NYSDOH OHI webpage was updated to allow for better display of state and county-level indicator data  
[http://www.health.ny.gov/environmental/workplace/occupational\\_health\\_surveillance/fundamental\\_occupational\\_health\\_surveillance.htm](http://www.health.ny.gov/environmental/workplace/occupational_health_surveillance/fundamental_occupational_health_surveillance.htm).
- The Occupational Health Surveillance web page was reworked to allow easier access to NYDOH occupational health programs, and to include the OHIs  
[www.health.ny.gov/environmental/workplace/occupational\\_health\\_surveillance/](http://www.health.ny.gov/environmental/workplace/occupational_health_surveillance/).

**AIM 1.** To collect, analyze, disseminate and evaluate all 21 Occupational Health Indicators developed by CSTE and NIOSH.

### **Methodology**

Partnerships have been maintained with all necessary partners in order to allow for collection of each of the OHIs. Staff annually collect, calculate and collate the indicators and provide them to NIOSH. In addition, staff provides assistance on maintaining and updating the how-to manuals for all indicators requiring hospitalization data and provides technical assistance to other states for these indicators, including work-related hospitalizations, work-related burn hospitalizations, pneumoconioses, and severe traumatic injuries.

### **Results/Accomplishments**

- NYSDOH staff has continued to generate all 24 of the occupational health indicators (OHIs) on an annual basis.
- Staff continues to provide technical assistance for five OHIs; four OHIs involving the use of hospitalization data (OHI #2- work-related hospitalizations, OHI #6-work-related hospitalized burns, OHI #9- pneumoconiosis and OHI #22- work-related severe traumatic injury hospitalizations) and the work-related asthma indicator (OHI #21). Staff continues to be responsible for the annual update to these indicators in the How-To document.
- Surveillance staff participated on the OHI Subcommittee ICD-10-CM transition workgroup.
- An updated 10-year trend analysis and summary report of the OHIs was completed and is currently undergoing internal review. The analyses describe NYS OHI data from 2008 through 2018 including the adoption of state-added indicators, and an in-depth look at racial and ethnic disparities within various indicators. It will be posted on the NYS OHI webpage and distributed to our surveillance partners when completed.

### **Discussion and Conclusions**

NYSDOH has effectively collected all occupational health indicators. In addition, staff have been involved in identifying and testing new indicators. Staff participate on national indicator workgroups and have used their expertise to provide guidance and technical assistance on many of the indicators.

The data generated is being used to inform communities, occupational health clinics, and local health departments by sharing the data with and through other NYSDOH programs. The data is also being reviewed over time to assist in better understanding trends and issues occurring in New York State. NYSDOH is also exploring state-added indicators using data sources unique or available within NYS.

**AIM 2.** To identify and evaluate occupational health data available in NYS to determine the magnitude and distribution of occupational injuries and illnesses, and to identify high-risk and disparate worker populations in both NYS and NYC.

### **Methodology**

Since there is no one complete source of information on the extent of occupational diseases an injury in NYS, it is important to explore and evaluate other datasets. Databases maintained by NYSDOH are available for analysis including hospital discharges, ED visits, outpatient clinic

visits, occupational registries including the Pesticide Poisoning Registry (PPR), the OLDR, and the Heavy Metals Registry; and the OHCN database. Since 1988, the first year of the OHCN, basic information on every patient visit has been collected allowing surveillance of the data without becoming an excessive data entry burden on the clinics or violating the Health Insurance Portability and Accountability Act (HIPAA). The data collected includes the patient's industry, occupation, diagnosis along with causal agents, and basic demographic information. Other information regarding the services that the clinics provide, i.e., IH and social work, are also included. The Registry information is maintained in databases which include their lab tests, diagnosing physicians, interview responses, sources of exposure and follow-up activities.

BOHIP has explored other data sources for information about adverse health outcomes among the New York working population. These include Poison Control Center (PCC) data; CODES data, which combines the hospitalization and ED data with the Department of Motor Vehicle's Accident Information System; Workers Compensation data and the New York Electronic Syndromic Surveillance System.

## Results

- Staff has conducted data analyses of both work-related hospitalizations and work-related emergency room visit data, including a time series trend analysis, and analyses by geographic area, sex, age, ethnicity and race to identify those disparate populations that are at high risk of occupational injuries and illnesses. External cause of injury codes (E-codes) for work-related injury hospitalizations are being explored as a method of further classifying work related injuries in minority populations in NYS, NYC and Upstate NYS. These E codes can provide supplementary information about the circumstances that led to an injury.
- Staff responded to internal DOH requests regarding COVID-19 in the working population during the peak of the COVID-19 wave in the spring and summer of 2020. Syndromic surveillance data was used. Work-related COVID visits comprised 2.5% of all COVID related visits. Staff continued to monitor the data while the "NYS PAUSE" was gradually lifted, but no other spike was shown.
- Staff has conducted additional analyses on work-related burns to better identify the characteristics of workers in New York State that are more at-risk for experiencing burns at their workplace. These analyses include hospitalization and emergency department data, Worker's Compensation claims and also includes the cost and lost-work time for these injuries. The preliminary data has been shared with industrial hygiene staff to begin development of appropriate outreach materials for those most at-risk including young workers and Hispanic workers. Staff will focus their educational materials on work done in restaurants and in construction work since they are the most prevalent sources of work-related burn injuries.
- The New York State Trauma Registry (TR) data has been explored to better characterize the occupational injuries that are not covered or reported by Workers' Compensation in the inpatient hospital data and to investigate the potential pattern and understand why work-related injuries would not claim workers' compensation. This data has been shared with internal partners.
- Hospitalization and ED data is being analyzed to calculate the costs associated with occupational injuries and illnesses in NYS, including the most common and expensive work-

related injuries/illness. This analysis will be developed into a factsheet and posted on the DOH webpage.

- Data on Work-related Assaults and Homicides in NYS was published in the November 2017 “Bureau of Occupational Health and Injury Prevention: Building a Safer New York” newsletter. Emergency discharge and hospital discharge data, along with data from BLS’ CFOI was examined to look at both mechanisms and rates of assault and homicide in New York during the time period 2012-2014. This newsletter is distributed to over 500 injury prevention professionals throughout NYS monthly.
- Emergency discharge and hospital discharge data, along with data from BLS’ CFOI was examined to look at both mechanisms and rates of assault and homicide in New York during the time period 2012-2014. The impact of poverty (defined as 20% or more of the population living at or below the federal poverty level) on nonfatal work-related assault risk was also evaluated.
- Staff is working to finalize an analysis of data from the NY Regional Poison Center to characterize the data as an adjunct to existing surveillance systems for occupational poisoning exposures in NYS. An abstract based on the results of this analysis was submitted to the 2020 CSTE annual conference to be considered for a poster presentation. The conference was cancelled due to the COVID-19 pandemic.
- Work-related hospitalization and ED data was examined by leading cause of work-related injury and was calculated by gender, race, ethnicity. Leading cause data was also calculated for NYS, NYC and upstate NYS and on the county-level. The top five causes of work-related injuries - assaults, cuts, falls, machinery and struck by - were examined by county also. Data was summarized and made available on the NYSDOH webpage at [http://www.health.ny.gov/statistics/prevention/injury\\_prevention/index.htm](http://www.health.ny.gov/statistics/prevention/injury_prevention/index.htm).
- Hospitalization data, ED data, and Workers’ compensation data was analyzed to determine the prevalence of fatal and non-fatal occupational heat-related illness in NYS and characterize the cases for future prevention efforts. This analysis will be developed into a presentation to be delivered at the 2020 Northeast Occupational Network meeting. The meeting was cancelled due to the ongoing COVID-19 pandemic.
- Staff provided data analytic support to industrial hygiene staff analyzing OSHA data on workplace violence fatality investigations. Results from this analysis was developed into a presentation which was delivered at a Bureau meeting.
- Staff attended the 2019 Northeast Epidemiology Conference in Portland, Maine and the 2020 Clinical Climate Change Conference in New York, New York, to discuss topics relevant to occupational health, share best practices and work on the improvement of staffs’ applied epidemiology competencies.
- Staff collaborated with the Injury Prevention Program to develop the ‘Injury and Occupational Health Data Reports’ section of the BOHIP webpage. This page contains posters, presentations and infographics on recent occupational health and injury topics and can be found at: [https://www.health.ny.gov/prevention/injury\\_prevention/injurydatareports.htm](https://www.health.ny.gov/prevention/injury_prevention/injurydatareports.htm).
- Data on musculoskeletal diseases/injuries in hospital data, emergency department data, and within the NYS OHCN was provided by staff to the Office of Mental Health. The data will be used as part of the Retaining Employment and Talent after Injury/Illness Network (RETAIN) Demonstration Project grant application to help disabled individuals to stay in the workforce.

- Staff shared information about eight cases of heat exposure deaths since 2011 as part of a national heat stress campaign. The goals are to share information on the dangers of heat stress and to develop a model action alert which can be shared with OSHA, urging them to implement a federal heat stress standard.
- Information relevant to first responders has been shared with the Bureau of Emergency Medical Services (EMS) and the NYS Intelligence Center, as appropriate. These include information on fentanyl safety for first responders, health data exchanges sharing information between emergency rooms and ambulances, and an infographic for EMS providers on how to stay safe on the job.

### **Discussion and Conclusions**

While the occupational disease registries, the OHCN database and the OHIs provide information about occupational injury and illness in NYS, there are other databases available that can assist in offering a more complete picture of the status of work-related diseases and injuries in NYS. Due to rate instability and variability between data sources, and due to underreporting and sampling issues, it is necessary to examine multiple years of data from as many sources as possible to obtain a more comprehensive picture of patterns of work-related injuries and illnesses among New Yorkers. Also, because of demographic variability between upstate New York (all of NYS excluding the five boroughs of NYC) and NYC, it is necessary to consider these geographic areas separately, whenever possible. To better define high-risk populations, data was also examined by demographic characteristics such as age and sex.

### **Products Developed**

#### Publications

- NYSDOH. NYS Environmental Public Health Tracking. CSTE Occupational Health Indicators. CSTE Indicators for NYS ,2000-2015.  
[https://apps.health.ny.gov/statistics/environmental/public\\_health\\_tracking/tracker/index.html#/ohiCSTEIndicators](https://apps.health.ny.gov/statistics/environmental/public_health_tracking/tracker/index.html#/ohiCSTEIndicators)
- NYSDOH. NYS Environmental Public Health Tracking. Occupational Health Indicators 2001-2016.  
[https://apps.health.ny.gov/statistics/environmental/public\\_health\\_tracking/tracker/index.html#/ohiOccupationalHealth](https://apps.health.ny.gov/statistics/environmental/public_health_tracking/tracker/index.html#/ohiOccupationalHealth)
- Occupational Health Indicators in New York State: 2000-2010. Chapter 1: The Changing New York State Worker Profile.  
[http://www.health.ny.gov/environmental/workplace/occupational\\_health\\_surveillance/indicators\\_report.htm](http://www.health.ny.gov/environmental/workplace/occupational_health_surveillance/indicators_report.htm)
- Occupational Health Indicators in New York State: 2000-2010. Chapter 2: Elevated Blood Lead Levels among Adults.  
[http://www.health.ny.gov/environmental/workplace/occupational\\_health\\_surveillance/indicators\\_report.htm](http://www.health.ny.gov/environmental/workplace/occupational_health_surveillance/indicators_report.htm)
- Occupational Health Indicators in New York State: 2000-2010. Chapter 3: Work-related Hospitalizations in New York State: 2000-2010.  
[https://www.health.ny.gov/environmental/workplace/occupational\\_health\\_surveillance/docs/chapter3.pdf](https://www.health.ny.gov/environmental/workplace/occupational_health_surveillance/docs/chapter3.pdf)

- Occupational Health Indicators in New York State: 2000-2010. Chapter 4 - Work-related Emergency Department Visits in New York State: 2005-2010.  
[https://www.health.ny.gov/environmental/workplace/occupational\\_health\\_surveillance/docs/chapter4.pdf](https://www.health.ny.gov/environmental/workplace/occupational_health_surveillance/docs/chapter4.pdf)
- New York State Community Health Indicator Reports – Occupational Health Indicators-2016: <http://www.health.ny.gov/statistics/chac/indicators/occ.htm>

#### NIOSH eNews

- Integrating Occupational Health Data: Occupational Health Indicators. NIOSH eNews, March 2016.
- New York State is Putting Occupational Health on the Map. NIOSH eNews ([www.cdc.gov/niosh/enews/enewsv15n12.html](http://www.cdc.gov/niosh/enews/enewsv15n12.html)), April 2018.

#### Presentations

- “Occupational Health Indicators, County Level Depiction,” 2014 NIOSH Partners Meeting for State Occupational Health Surveillance, December 2014, Cincinnati, OH.
- “Using Hospital Data to Identify Disparities in Work Related Injuries and Illnesses in New York State”. 2015 Council of State and Territorial Epidemiologists Annual Conference, June 2015, June 2015, Boston, MA.
- “Using Hospital Data to Identify Disparities in Work-Related Injuries and Illnesses in New York State”. 2016 Council of State and Territorial Epidemiologists Annual Conference, June 2016, Anchorage, AK.
- “Work-Related Assaults and Homicides, New York State (NYS), 2012-2014\*”. 2017 Council of State and Territorial Epidemiologists Annual Conference, June 2017, Boise, ID. (\* CSTE poster award finalist)
- “Identifying Work-Related Injuries in Trauma Data: A Comparison of Methods of New York State”. 2017 Council of State and Territorial Epidemiologists Annual Conference, June 2017, Boise, ID.

#### Webpage updates

- Leading Cause of Work-related Injury.  
[https://www.health.ny.gov/statistics/prevention/injury\\_prevention/index.htm](https://www.health.ny.gov/statistics/prevention/injury_prevention/index.htm)
- Injury and Occupational Health Reports  
[https://www.health.ny.gov/prevention/injury\\_prevention/injurydatareports.htm](https://www.health.ny.gov/prevention/injury_prevention/injurydatareports.htm)

## **Abstract – Adult Blood Lead Surveillance**

The NYSDOH's Heavy Metals Registry (HMR) is a tool for the surveillance of adult exposures to lead. Lead is widely used in industry and has the potential to cause illness due to acute or chronic lead exposure. Reducing lead exposures at work and in the community is essential to avoid adverse health effects in humans. Regular surveillance of blood lead levels (BLLs) can identify exposures in both communities and workplaces, thus allowing for early initiation of measures to help prevent exposures and potential illness.

### **Findings**

1) Regular, daily monitoring of blood lead reports via the HMR database allows for quick identification of all BLL reports of 5 mcg/dL and above and referral to industrial hygienists in BOHIP for rapid intervention, if warranted.

Based on BLL surveillance data identifying workers with elevated BLLs, BOHIP staff has provides educational materials and offers technical assistance to around 400 employers, more than 1,500 workers, and more than 160 healthcare providers on an annual basis. Monthly reports are generated to allow for easy identification of new lead companies, and overall trends in the data. Annual or multi-annual reports are written and posted to the HMR webpage to describe changes in the data over time and keep the public informed.

2) By routinely interviewing adults with elevated BLL values (5 mcg/dL and above for women of childbearing age and both men and women 16 and 17-years old; 15 mcg/dL and above for all others), the NYSDOH can collect information on possible exposure sources while also advising the person on appropriate control measures to limit future exposures.

Demographic information is collected along with information on the subject's work and home environment through the telephone interview. This interview is used to determine possible sources of exposure and to advise the person on appropriate control measures. If an exposure is work-related, information is gathered on the employer, work location, lead protection measures in place, and whether coworkers are also potentially exposed. Information on reducing exposures is provided during interviews with the exposed individual, and brochures and relevant fact sheets are sent following an interview. Interview questionnaire information is also part of the database and immediately available for follow-up and research activities. BOHIP industrial hygiene staff provide consulting services to worksites with employees who have high or persistently elevated BLLs.

3) The pregnant women collaborative program ensures timely identification of lead poisoned pregnant women and follow-up of their at-risk newborn babies.

The sharing of the case information between the adult HMR and the Childhood Lead Prevention Program (CLPP) has provided better case management for both programs, allowing for information on the family to be shared. The collaboration helped to present complete case information to the counties for timely follow-up. The information provided to the county public health nurses by the HMR staff has prepared the investigators to go into the home for follow-up

investigations and implement prevention measures before the birth of the new baby. Other children of the cases' who would not have been tested are offered blood lead testing. Potential sources of lead exposure identified during the HMR interview are shared with counties which has helped them look for the source during their home evaluation. When a mother with an elevated BLL is discovered, it is imperative that the OB/GYN office informs the pediatricians' office that the pregnant mother has an elevated BLL, so the pediatrician knows to have the baby tested at birth.

### **Translation of Findings**

Lead exposure is still an ongoing health problem in NYS. Daily surveillance allows for fast intervention in the case of potential poisonings. Routine telephone interviews with cases allow for the collection of exposure information. Technical assistance and educational materials have been provided to thousands of workers and hundreds of employers during the project period. Collaboration with internal and external partners allows for complete case information to be properly evaluated and exposures to be controlled in workers and pregnant women.

### **Intermediate Outcomes**

- More than 15,000 blood lead reports were submitted to NIOSH's Adult Blood Lead Epidemiology and Surveillance Program (ABLES) during the project period. The data is compiled with other states also participating in the ABLES program. The program examines US trends in adult workplace lead exposure to identify where exposures occur.
- Educational materials on lead exposure prevention are provided to individuals with elevated blood lead levels, by daily surveillance of laboratory data and continued data collection via telephone interviews.
- The NYS HMR was updated to incorporate cases with blood lead levels of 5 µg/dL or higher. This will allow staff to see and evaluate an individual's full lead testing history. Previously, cases were only case matched at 10 µg/dL or higher.
- Social media was used to post messages to raise awareness of lead exposure among adults in NYS and encourage pregnant women to talk to their physicians about getting a lead test.

## **Final Scientific Report – Adult Blood Lead Surveillance**

### **Background**

The NYSDOH established the HMR in 1980 under Sections 22.6 and 22.7 of the State Sanitary Code and reporting to the Registry began in 1982. All clinical laboratories, both in-state and out of NYS performing tests for lead on individuals residing or employed in NYS must report the results of the test to NYSDOH. From 1982 to 1986, BLLs of 40 micrograms per deciliter (mcg/dL) or higher were reportable. In 1986, the reportable BLL was lowered to 25 mcg/dL or higher. Then in 1992, as part of a major childhood lead poisoning prevention initiative, legislation was enacted to require the reporting of all BLL for all age groups, regardless of level. This legislative change has helped to identify elevated BLLs early and verify decreases in BLLs.

There has been a trending decrease in the number of elevated BLLs reported to the HMR since the mid-1990s. This trend follows the national trends of decreasing BLLs in adults and

children.<sup>10</sup> The principal source of lead in adults is primarily through occupational exposures, although NYS data indicate that nearly 20% of exposures in NYS adult residents are due to non-occupational sources, especially among individuals with severely elevated BLLs (60+ mcg/dL).<sup>11</sup> Since 2012, there has been an increase in the number of tests reported with BLLs below 10 mcg/dL, indicating a high rate of screening for lead poisoning. Since 2021, there has been an increase in the number of tests reported with BLLs.

Despite the overall decline in prevalence of elevated BLLs, there are certain groups that continue to have a high prevalence of elevated BLLs in NYS including occupationally exposed iron/steel workers, bridge workers, lead abatement workers and residential remodelers (with both occupational and non-occupational sources).<sup>12</sup> This is due to increases in both blood lead testing among exposed individuals and in BLL among these groups. Previous data analysis has shown that the most common sources of non-occupational exposures in NYS include folk remedy usage, target shooting and residential remodeling.<sup>12</sup> Non-occupational exposures also represent a relatively large percent of individuals with severely elevated BLLs, compared to lower BLLs. It is possible that these individuals were tested because they were symptomatic.

Types of lead exposures vary by gender. Women in NYS are primarily exposed to lead via non-occupational activities, and the number of women with known non-occupational exposures has increased three-fold in the past decade. An increase in non-occupational exposures over time has also been seen in men, but the primary source of exposure for men remains occupational.<sup>12</sup> This overall increase in tests among women of childbearing age suggest that women may be receiving prenatal screening for lead. Although NYS does not require blood lead testing for all pregnant women, NYSDOH regulations state that “Prenatal health care providers shall screen or refer for blood lead screening each pregnant woman found to be at risk for current high dose lead exposure.”<sup>13</sup> NYSDOH, in collaboration with the American College of Obstetricians and Gynecologists, has developed “Lead Poisoning Prevention Guidelines for Prenatal Care Providers.”<sup>14</sup> These guidelines include risk assessment questions for pregnant women.

Data from the HMR is constantly being reviewed and utilized for prevention efforts. The HMR is an interactive system which is updated daily and includes demographic, and occupational information. Blood lead reports are received electronically from laboratories daily, and BOHIP staff case-match all reports with BLLs 5 mcg/dL or greater and add them to the database each morning. All surveillance and follow-up information are available to staff instantly as changes and updates occur. This greatly enhances the ability of staff to determine if a report has already been received by BOHIP; correct report and case data immediately; make new information directly available to all staff; uncover and correct errors; add new employers; assign cases to interviewers; and track the progress of cases with elevated test results, daily. The electronic database also allows the industrial hygiene staff easy on-line access to up-to-date information in support of their employer targeted follow-up and intervention efforts.

BOHIP also has monthly reports generated listing high and low values for each company along with the number of tests and their mean and median values. BOHIP routinely interview adults with elevated BLL values (5 mcg/dL and above for women of childbearing age and both men and women 16 and 17-years old; 15 mcg/dL and above for all others). Demographic information is collected along with information on the subject’s work and home environment. This interview is used to determine possible sources of exposure and to advise the person on appropriate control

measures to limit future exposures. If an exposure is work-related, information is gathered on the employer, work location, lead protection measures in place, and whether coworkers are also potentially exposed. Information on reducing exposures is provided during interviews with the exposed individual, and brochures and relevant fact sheets are sent following an interview. Interview questionnaire information is also part of the database and immediately available for follow-up and research activities.

**AIM 1.** To continue to collect data on all adult blood lead levels regardless of level, through the NYSDOH's HMR. Data will be used to calculate CSTE OHI #13, elevated blood lead levels among adults. Elevated blood lead data will be continuously reviewed, and cases with blood lead levels of 10 mcg/dL and above will be followed back and monitored. Data will be used for worksite investigations and intervention activities.

### **Methodology**

HMR staff continue to do daily collection and monitoring of adult blood lead data with blood lead levels 10 µg/dL or greater. Reports are run monthly for quality assurance purposes as well as monitoring by industrial hygienists for high-risk industries and companies.

### **Results/Accomplishments**

- Occupational health data describing lead, mercury, arsenic and cadmium exposure, and patterns and predictors of personal protection compliance and workplace hygiene behaviors among workers with elevated blood lead levels have been shared through a peer-reviewed publication and the NYSDOH website.
- Adult blood lead data is annually submitted to NIOSH's ABLES Program. Included in the data submission are basic demographics (age, sex, ethnicity) of all adults (age 16 or older) with blood lead levels equal to or greater than 10 µg/dL and their occupation, industry and exposure source, if known. There were 3,336 blood lead tests reported to the NYSDOH's HMR during 2016, 3,580 blood lead tests reported during 2017, 2,972 blood lead tests during 2018, 3,115 blood lead reported during 2019 and 2,516 blood lead tests reported during 2021.
- A summary of data from the HMR for 2006 through 2010 was completed and posted on the NYSDOH web [http://www.health.ny.gov/environmental/workplace/heavy\\_metals\\_registry/report\\_2010.htm](http://www.health.ny.gov/environmental/workplace/heavy_metals_registry/report_2010.htm).
- The *Lead on the Job* brochure for workers has been rewritten to include more up to date information and piloted with focus groups to ensure messages are written in appropriate language. This has been translated into Spanish. Both versions have been made available to the public on the NYSDOH website.
- Staff from the adult lead program developed adult blood lead management guidelines. In collaboration with Wadsworth Laboratory staff, the guidance document and a letter will be mailed to all NYS laboratory directors for their reference in interpreting blood lead levels in adults. Wadsworth Laboratories oversees the Clinical Laboratory Evaluation Program.
- The Sedgewick County Health Department in Wichita, Kansas contacted staff for permission to adapt the NYS "Aim at Lead Safety" brochure, to disseminate it to their residents for educational purposes.
- NYSDOH staff regularly holds conference calls with staff from the NYC Department of Health and Mental Hygiene Environmental Risk Assessment Unit, to discuss ongoing work

with employer and medical provider outreach strategies, social media campaigns, occupational health regulations and interesting/unique exposure cases.

- Industrial hygiene staff conducted outreach and provided educational materials to a local police department regarding lead exposure in firing ranges after the department received a grant to revitalize its range. Ongoing technical assistance for this project will be provided. The NYSDOH “Aim at Safety” brochure was also provided.
- Staff provided expertise to another ABLES state regarding a lead poisoning cluster incident at a gun range. Staff shared their outreach materials as well as experiences learned from prior investigations in New York.
- Staff continue to identify cases with elevated blood lead levels (25+ µg/dL) including a case in a self-employed residential construction contractor, a target shooter, a person who was renovating a 150-year-old house, a self-employed steel cutter, a person with a lodged bullet, a metalworker who cuts and torches metal, a laborer/foreman bridge worker and a self-employed worker who specializes in restoring vintage instruments using tin/lead solder. In these instances, surveillance staff and industrial hygiene staff collaborate with the testing physicians to monitor levels.
- In October 2019, HMR staff identified a new company in the HMR with 27 employees tested for blood lead levels (BLLs). The employees of this company had among the highest recorded BLLs in the history of the HMR. The company was a specialty window and door restoration company in Western NY. Four of the 27 employees had elevated BLLs above 100 ug/dL and most of the remaining employees’ BLLs ranged between 0–90ug/dL. This specialty company used sub-contracted field technicians to remove pre-1980s windows and doors from a commercial building being renovated and deliver them to a warehouse workshop. Inside the warehouse, employees stripped the paint, and sanded and refurbished the windows. The old buildings that were being renovated had leaded paint on interior and exterior surfaces as well as on windows and doors. The employer did not test the surfaces for lead. BOHIP staff contact with employees indicated a lax safety culture and no enforcement of rules. There were deficiencies in respiratory protection, hygiene, and sanitation. Interviews with workers conveyed a lack of clear direction to use respirators to block lead dust inhalation. Workers were also unaware of important hygiene practices after working with lead, such as washing hands, taking showers and changing contaminated clothing before leaving the worksite to prevent “take-home lead” exposure. There was a lack of employee understanding about the separation of areas and processes that were “clean” versus “dirty” with lead dust. In addition, this small company didn’t have a health and safety director; there was not one person in charge of ensuring health and safety protocols were in place or being followed. The employees and the company cooperated with BOHIP staff when they realized that people were getting sick at work from lead exposure and the company saw the need to engage in better health and safety practices. Operations were shut down completely in the warehouse. Employees were placed on a medical monitoring plan following OSHA guideline. The company hired a training company and reached out to the safety group from their insurance carrier to assist them. Engineering controls in the form of a new ventilation system in a dedicated room were implemented. A Respiratory Protection Program was set up, with fit-testing and medical clearance; other appropriate personal protective equipment (PPE) was assigned. Employees are now required to wear this PPE when working with lead or other hazardous materials. Work areas and breakrooms were surface tested for lead and the facility was thoroughly cleaned and retested. Access to showers and improved, and

sanitation/housekeeping methods were put in place. Standard operating procedures (SOPs) were written incorporating all the changes in policy and procedures. Employees have been trained on the SOPs and on annual lead training, including a review of the OSHA standard and the hazards of lead. BOHIP staff provided information about the local OHCN's site that can provide follow-up medical care if needed. Staff continue to track employees of the worksite to monitor their BLLs, which are now all below 30ug/dL, and to follow up on company progress.

- BOHIP staff prepared an article, "Lead Can be a Hidden Workplace Danger" for the Center for Environmental Health's 'In the Field' Summer 2020 publication. The purpose of the newsletter is to promote collaboration and communication among all environmental health staff in NYS' central, regional and local health department offices. The article describes the experiences and success BOHIP staff had in identifying the lead risks and providing education and recommendations to reduce workplace exposures to the employees at the specialty window and door restoration company in Western NY. The publication was put on hold due to the ongoing COVID-19 pandemic.
- Industrial hygiene staff followed up with an independently owned construction firm which does window restoration and restoration of other architectural objects in historical building in the Albany area after several employees were tested with elevated BLLs. Guidance and general recommendations on reducing lead exposures were provided to the company.
- Industrial hygiene staff followed up with a small construction company doing painting and bridge restoration work within the NYS canal system. Four employees were reported to the HMR with elevated BLLs. Site-specific exposure reduction techniques were provided to the company.
- Staff provided data to the NYC Department of Health and Mental Hygiene on the number of people with blood lead levels 10 mcg/dL with exposures due to a gunshot wound since 2010. The data was also stratified by gender and age.
- A data brief, 'Progress in Preventing Adult Lead Poisoning in NYS, 1982-2017', was published in the October 2018 "Bureau of Occupational Health and Injury Prevention: Building a Safer New York" newsletter. Trends in blood lead surveillance data were used to demonstrate New York's progress towards adult lead poisoning prevention over the last 35 years. This newsletter is distributed to over 500 injury prevention professionals throughout New York State monthly.
- Staff provided expertise and consultation assistance to the Bureau of Community Environmental Health and Food Protection regarding their update to the lead prevention brochure "What you need to know about working with lead-based paint" for residential homeowners. Detailed information and photos were provided on how to work with lead-based surfaces before you paint and how to deal with surfaces to reduce exposures.
- The project director provided expertise to a newer Adult Blood Lead Epidemiology and Surveillance (ABLES) state regarding New York's case follow-up process, lessons learned, and modifications made to the system after a program evaluation. Data collection instruments including the questionnaire and fact sheets and other resources available on the NYSDOH website were also shared.
- Over 200 copies of BOHIP's 'Health Dangers of Lead on the Job' brochure were requested by the Adirondack Occupational Health Center to use for their lead prevention project in the North Country.

- The NYSDOH webpage on lead was completely re-designed and information on Adult Lead Poisoning Prevention can be found at: [https://www.health.ny.gov/environmental/lead/adult\\_groups.htm](https://www.health.ny.gov/environmental/lead/adult_groups.htm). Important information was highlighted and subject areas, including a section on adult lead poisoning, information for pregnant women and lead data and statistics were categorized to make it easier to find.
- Data from the HMR was used for needs assessments for the OHCN to target at-risk lead exposed populations in their catchment areas.
- Data from the HMR was provided to the ABLES Program for a Morbidity and Mortality Weekly Report (MMWR) article. The article presents data on elevated blood lead levels among employed adults the United States for 1994-2013.
- The NYSDOH’s Facebook page, ran an awareness campaign during National Lead Poisoning Prevention Week, October 20-26, 2019, to create awareness among workers about the hazards of lead among workers. The Facebook posts directed people to our ‘Health Dangers from Lead on the Job’ brochure, which is available on our NYSDOH webpage.
- The publication, ‘*Beware of Lead*’, was updated with additional information about potential lead exposures including using cookware from outside the U.S. and working with lead and was published at: <https://www.health.ny.gov/publications/6517/>. The fact sheet was translated into Spanish and Burmese which will allow for targeted outreach to the immigrant and refugee population in New York. This publication educates all NYS residents about the hazards of lead from a variety of sources including lead burden from their country of origin such as spices, food, cookware, pottery or ayurvedic use.
- NYS HMR staff published a manuscript titled “Patterns and Predictors of Personal Protection Compliance and Workplace Hygiene Behaviors Among Lead Exposed Workers in New York State” in the Journal of Occupational and Environmental Hygiene. The paper describes patterns of personal protection utilization and employee hygiene among workers exposed to lead in the state. It also identifies significant predictors of consistent PPE use and good personal hygiene among these workers
- BOHIP staff submitted two questions and answers related to the publication, “Patterns and Predictors of Personal Protection Compliance and Workplace Hygiene Behaviors Among Lead Exposed Workers in New York State”, to ‘The Action Level’ program – a self-study, continuing education program offered by American Conference of Governmental Industrial Hygienists. Certified industrial hygienists and safety professionals can earn certification maintenance and/or continuance of certification points through their participation in ‘The Action Level’.

**AIM 2.** To continue the pregnant women collaborative program with the NYS Childhood Lead Prevention Program (CLPP) and county health departments to ensure timely identification of lead poisoned pregnant women and follow-up of their at-risk newborn babies.

### **Methodology**

The adult blood lead program continues to work with the CLPP in identifying pregnant women with elevated blood lead levels and informing the local health departments of the case with the due date to ensure the newborn gets their lead level tested and appropriate interventions occur. The program facilitates more timely and proper blood testing of newborns who might have not been tested for lead at birth.

Educational materials have been developed and distributed to women throughout NYS, with an emphasis on pregnant women, regarding the hazards of lead and the various sources of lead exposures. Informational material for physicians regarding the guidelines for lead testing in pregnant women and treatment guidance have also been distributed.

### **Results/Accomplishments**

- Annually, HMR staff follows up on between 35-45 pregnant women to reduce their lead exposures prior to the birth of their child. The most common source of exposure among this population continues to be spices and/or food sources, use of Ayurvedics, use of makeup from outside the United States, and home renovation.
- Staff met with internal partners to discuss topics of lead in pregnancy and the follow-up of the lead tested newborns at ages one and two. HMR staff provided pregnancy, newborn, and child lead level data on more than 200 pregnant mother cases from 2013-2018 to evaluate the newborn lead levels at ages one and two and in some cases, beyond. The data findings were used to facilitate an email campaign to obstetricians and pediatricians in NYS. A mailing was conducted to all obstetricians in NYS informing them to review the source of lead exposure for the women and to ensure the newborn gets their lead level tested.
- Staff collaborated with the CLPP and the Wadsworth Center on revisions to the Blood Lead Standard for NYS laboratories. The changes are in respect to single use screening devices and guidance on lowering the reference value to 5 mcg/dL on all blood lead results. Health care providers and laboratories will be provided with guidance in interpretation as discussed above.
- The new brochure, “*Pregnant? Tips to Protect Your New Baby from Lead*”, was posted online at: <https://www.health.ny.gov/publications/6630.pdf>. This brochure will be distributed to all pregnant women identified through the HMR follow-up and interview process, to remind them of the importance of getting a blood lead test while pregnant. The brochure was also translated into 19 other languages - Spanish, Chinese, French, Russian, Somali, Arabic, Haitian Creole, Karen, Italian, Urdu, Amharic, Burmese, Farsi, Karenni, Kinyarwanda, Nepali, Pashto, Swahili and Ukrainian.
- Reference tip cards, “*Recommendations for Follow-up Blood Lead (BLL) Testing in Pregnant and Lactating Women*” were developed (available at: <https://www.health.ny.gov/publications/6624.pdf>). They were designed to provide guidance to obstetricians and other health care providers regarding follow-up blood lead testing in pregnant and lactating women that follow CDC recommendations. In addition, the tip cards provide a reference for physicians regarding the NYS Regional Lead Resource Centers which can provide treatment advice and assistance. Twenty thousand tip cards were distributed to all NYS counties to help aid in their education and outreach to local physicians that treat pregnant women with elevated lead levels.
- As of October 2019, regulations in NY have been updated to revise the definition of an elevated blood lead level in children to mean a blood lead level of 5 µg/dL. Because of this, staff met regularly with the Center for Environmental Health’s Medical Director and Childhood Lead staff to discuss topics of lead in women of childbearing age and pregnant women and discuss future plans. This includes examining regulatory and guidance options for the identification and management of lead exposure in pregnant women. Next steps would include collecting and examining data, evaluating literature and policies and

consultation with stakeholders. This work was temporarily put on hold due to the COVID-19 pandemic.

- “Guidelines for Identification and Management of Lead Exposure in Pregnant Women”, was presented to the New York State Advisory Council on Lead Poisoning Prevention. The presentation summarized current case management practice of pregnant women with elevated blood lead levels and what else has been done by the program to ensure newborns are tested immediately after birth. Next steps were also discussed.
- In conjunction with the Center for Environmental Health’s Outreach and Education and the DOH’s Bureau of Marketing and Creative Communications, staff at created a digital and social media campaign targeted to women of childbearing age (16-44) regarding lead exposure in pregnancy. The campaign also featured web banner ads. The campaign has been run in June of 2017, May – June of 2018, May - June of 2019 and May of 2021. The banner ads delivered 4.7 million viewable impressions with almost 4,000 clicks to the website, while the social media campaign delivered almost 1,400,000 impressions, resulting in more than 28,000 clicks to our lead and pregnancy publications on the NYSDOH webpage.

### **Discussion/Conclusions**

Extensive work has been conducted regarding the promotion of awareness of lead poisoning among workers and pregnant women. Presentations have delivered prevention messaging to partners and directly to the exposed populations. Directed social media campaigns that identify and direct audiences to educational materials, also help to increase the visibility of materials to targeted populations.

Changes made to the Heavy Metals Registry database allowed staff to follow up with women at lower blood lead levels and therefore allow for better education of those with exposures. Lowering the blood lead level of concern in women, allow us to better collaborate with partners to ensure newborn babies born to mother with elevated blood lead levels, are tested for lead immediately upon birth.

### Products Developed

#### Publications

- Nwudu, V., Fletcher, A., Bauer, M. (2018). **Patterns and predictors of personal protection compliance and workplace hygiene behaviors among workers with elevated blood lead levels in New York State.** Journal of Occupational and Environmental Hygiene, 15:9, 654-663, <https://www.ncbi.nlm.nih.gov/pubmed/30081768>.
- NYSDOH. New York State Heavy Metals Registry, 2010-2015, [https://www.health.ny.gov/environmental/workplace/heavy\\_metals\\_registry/report\\_2015.htm](https://www.health.ny.gov/environmental/workplace/heavy_metals_registry/report_2015.htm)
- Centers for Disease Control and Prevention. Morbidity and Mortality Report (MMWR). Elevated Blood Lead Levels Among Employed Adults – United States, 1994- 2013. [https://www.cdc.gov/mmwr/volumes/63/wr/mm6355a5.htm?s\\_cid=mm6355a5\\_e](https://www.cdc.gov/mmwr/volumes/63/wr/mm6355a5.htm?s_cid=mm6355a5_e)

#### Presentations

- The NYS Heavy Metals Registry and Pregnant Women Follow-up”, New York State Advisory Council on Lead Poisoning Prevention meeting, April 2016, Albany NY.

- The NYS Heavy Metals Registry and Pregnant Women Lead Follow-up. Northeast Epidemiology Conference, October 2016. Saratoga, Springs NY.
- Protecting the Newborns of Mothers with Elevated Blood Lead Levels. 2017 Council of State and Territorial Epidemiologists Annual Conference, June 2017, Boise, ID.
- Testing Pregnant Women for Lead. New York State Advisory Council on Lead Poisoning Prevention Meeting, March 2019, Rensselaer, NY.
- Guidelines for Identification and Management of Lead Exposure in Pregnant Women. New York State Advisory Council on Lead Poisoning Prevention Meeting, January 2020, Albany, NY.
- Progress in Preventing Adult Lead Poisoning in New York State, 1982-2017. 2019 Northeast Occupational Health Network Conference, April 2019, Chester, CT.

#### Fact Sheets

- ‘Pregnant? Tips to Protect Your New Baby From Lead’ brochure [https://www.health.ny.gov/environmental/lead/education\\_materials/index.htm](https://www.health.ny.gov/environmental/lead/education_materials/index.htm).
- ‘Health Dangers From Lead on the Job’ brochure (<https://www.health.ny.gov/publications/2543.pdf>).
- ‘Recommendations for Follow-up Blood Lead (BLL) Testing in Pregnant and Lactating Women’, reference tip cards <https://www.health.ny.gov/publications/6624.pdf>.
- Beware of Lead’. <https://www.health.ny.gov/publications/6517.pdf>

**PHS Inclusion Enrollment Report**

**Study Title:** Occupational Health and Safety Surveillance and Intervention in New York State

**Comments:** Adult Blood Lead Epidemiology and Surveillance

Racial Categories	Ethnic Categories									Total
	Not Hispanic or Latino			Hispanic or Latino			Unknown/Not Reported Ethnicity			
	Female	Male	Unknown/ Not Reported	Female	Male	Unknown/ Not Reported	Female	Male	Unknown/ Not Reported	
American Indian/ Alaska Native	5	23	0	0	0	0	0	0	0	28
Asian	310	283	0	0	0	0	0	0	0	593
Native Hawaiian or Other Pacific Islander	0	0	0	0	0	0	0	0	0	0
Black or African American	136	979	0	0	0	0	0	0	0	1,115
White	392	6,300	0	0	0	0	0	0	0	6,692
More Than One Race	0	0	0	0	0	0	0	0	0	0
Unknown or Not Reported	104	451	0	395	2,702	0	774	3,762	0	8,188
<b>Total</b>	<b>947</b>	<b>8,036</b>	<b>0</b>	<b>395</b>	<b>2,702</b>	<b>0</b>	<b>774</b>	<b>3,762</b>	<b>0</b>	<b>16,616</b>

## **Abstract – New York Occupational Lung Disease Program**

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Work-related asthma (WRA) is a lung disease caused or made worse by exposures to substances in the workplace. In New York State (NYS), there were over 1,400 new cases of WRA identified in workers over the six-year project period. This is an underestimate of the actual number of individuals with WRA in NYS. Recent occupational health indicator data from NYS have estimated that approximately 43 percent of ever-employed adults with asthma report that their asthma was caused or made worse by exposures at work. This translates into hundreds of thousands of adults who may potentially have WRA.

The program faced the challenge of health care providers often not asking about workplace triggers when diagnosing and managing patients with asthma, and not reporting the case to the surveillance program when the association was made. The program utilized many different outreach methods to increase the recognition and diagnosis of WRA, including presentations to partners, publishing articles in newsletters, direct mailings to physicians and hospitals, and including information in the clinical guidelines for diagnosis, evaluation and management of asthma. The program also identified other sources of data, such as workers' compensation and poison control centers, and syndromic surveillance, and established partnerships and to better obtain and analyze the data.

The "*Is Your Asthma Work-related?*" brochure continues to be widely distributed. The brochure assists patients in identifying their triggers as well as talking with their physician about their asthma. The NYSDOH "Clinical Guideline for the Diagnosis, Evaluation and Management of Adults and Children with Asthma", was dated and has included a statement regarding notifying the Occupational Lung Disease Registry (OLDR) of suspected occupational lung diseases. The guideline also recommends that physicians consider the work environment along with other environmental measures to control asthma. Safety tip cards, which convey key messages in English, Spanish and through pictures, continued to be requested from internal partners and distributed to the lodging industry

Throughout the project period, industrial hygiene staff provided over-the phone technical assistance to individuals and companies in controlling workplace hazards. They also provided comprehensive site visits in a variety of settings to observe work processes, evaluate exposures, and make recommendations in areas such as automobile shredding, scenic art production, food processing, packing and production facilities, hospitals, schools and salons. BOHIP industrial hygiene staff have also worked extensively on COVID-19 exposure in workers.

By increasing case ascertainment to better identify problems, and recommending and implementing outreach and intervention activities, the NYSDOH has successfully expanded its capacity for WRA surveillance.

## New York State Occupational Lung Disease Program

### Significant Findings

- 1) Utilization of multiple data sources is a key component of an occupational health surveillance program.

NYS has regulations governing the reporting of occupational lung disease to the NYS DOH by physicians, health care facilities, and clinical laboratories. While these regulations are important in obtaining access to patient information related to occupational lung disease, physicians often do not report. To identify and obtain information on occupational lung disease, it is important to identify and obtain access to many data sources including hospital discharge, ED, workers' compensation and PCC data.

- 2) Physician outreach on reporting requirement did not increase physician reporting.  
The program undertook multiple endeavors that did not result in increases in reports.

- 3) Cleaning materials are a common source of work-related asthma.

Data from the NYS Occupational Lung Disease Program found that cleaning materials still account for 15 percent of the confirmed cases of WRA. Many cleaning products contained chemicals that have been associated with causing asthma or making existing asthma worse. Workers using cleaning products were at risk, as were others in areas where these cleaning products were used.

- 4) Forty-three percent of ever-employed adults with current asthma reported that their asthma was caused or made worse by exposures at work.

The Asthma Call-back Survey (ACBS) is an in-depth asthma survey that includes multiple questions related to the work-relatedness of a respondent's asthma and provides population-based information that would otherwise not be available on WRA.

- 5) Partnerships continue to be an important part of accomplishing the activities with the occupational lung disease program.

A cross-organizational response was essential in all aspects of program activities including case ascertainment, providing medical knowledge and services, assisting with the development of outreach materials, and providing a mechanism for distribution. External expertise assisted with identifying needs, problems, and solutions.

### Translation of Findings

- 1) Occupational health and safety programs can utilize these methods for case ascertainment to conduct surveillance of occupational lung disease. These sources were used to substantially increase occupational lung disease case identification in NYS.
- 2) Dedicating resources with the sole purpose of increasing physician reporting of occupational lung disease to state health departments is not a practical use of limited resources. Concentration on other methods of case ascertainment is prudent.
- 3) Social media marketing strategies get work related asthma prevention information to both workers and the decision makers who need to be convinced of the need for change. Digital media has proven successful in delivering information to the high-risk populations. NYSDOH webpages were revised to ensure that prevention messages were appropriate and

easy to understand. These social media posts help in identifying successful prevention efforts in health communications.

- 4) Health educators and non-physician healthcare providers such as pharmacists may be more receptive to outreach and education on recognizing work as a possible component of a person's asthma. In NYS, projects are being designed to target these groups.

#### Intermediate Outcomes:

- The use of different data sources resulted in the identification additional cases of occupational lung disease, most of which would not have been captured if the program relied solely on the physician and health care facility reporting regulation to produce reports.
- Data was provided to NIOSH for use in their research and for publication in the Work-Related Lung Disease Surveillance System (eWoRLD).
- Data on asthma continues to be collected via the Behavioral Risk Factor Surveillance System (BRFSS).
- The work-related asthma indicator continues to be collected. The indicator, using data from the ACBS, calculates the ever-employed adults with current asthma who report that their asthma was caused or made worse by exposures at work.
- More than 20,000 copies of the "*Is Your Asthma Work-related?*" brochure have been distributed in English and Spanish.
- The factsheet, "Silicosis and Silica Exposure", was distributed to construction workers throughout NYS.
- The "Asthma Trigger Tracker and Key Questions" was updated in 2016. The trigger section of this tool is designed to help patients keep track of their asthma and asthma symptoms, the key question section is intended to help facilitate patient-provider communication. It can be a helpful aid in having patients recognize potential triggers in their workplace.
- The NYSDOH Cleaning Product Safety Cards that encourage asthma friendly cleaning practices, were distributed to essential workers at-risk of exposure to cleaning agents, during the COVID-19 pandemic.
  - The fact sheet, "Silicosis and Mining: Information for Workers" was also developed and distributed to surface mine workers throughout the state.
  - Educational materials on WRA were provided to over 1,200 workers who received training for asbestos abatement. These workers included those conducting asbestos abatement and in fields such as construction, plumbing, and maintenance.
  - Social media was used to post messages to raise awareness and to educate physicians and improve the physician-patient communication of workplace exposures that may be contributing to the respiratory illness.

## Final Scientific Report – Occupational Lung Disease Program

### Background

Occupational exposures are important preventable and modifiable, yet often overlooked contributors to the burden of respiratory disease. Inhalation of vapors, gas, dust, or fumes in the workplace is common, and occupational exposure is an important contributor to the burden of respiratory disease globally.<sup>15</sup> Occupational respiratory diseases are a group of illnesses that are caused by either repeated, extended exposure or a single, severe exposure to irritating or toxic substances that leads to acute or chronic respiratory ailments. According to the American Lung Association, occupational lung disease is the number one cause of work-related illness in the US in terms of frequency, severity and preventability.<sup>16</sup> Common occupational lung diseases include mesothelioma, occupational asthma, silicosis, asbestosis, and respiratory conditions due to fumes and vapors. COPD (chronic obstructive pulmonary disease) though primarily caused by smoking, can also result from workplace exposures.<sup>17</sup>

Work-related asthma is now the most commonly reported work-related respiratory illness in many industrialized countries.<sup>18</sup> It is a potentially preventable condition affecting an estimated 1.5 million people in the US alone and includes both work aggravation of preexisting asthma and new-onset asthma induced by work exposures.<sup>19, 20</sup> There have been over 350 substances (i.e. asthmagens) in the workplace documented to either cause asthma or exacerbate asthma in people who already have the condition, putting an estimated 20 million workers at potential risk for developing WRA.<sup>21,22</sup>

The proportion of asthma caused or made worse by workplace exposures has been difficult to enumerate. The American Thoracic Society and the American College of Chest Physicians have concluded approximately 15% of adult asthma cases have an occupational component.<sup>23</sup> However, WRA estimates vary depending on the population, case definition and survey methodology. The proportion of asthma attributed to or made worse by work exposures have ranged from 7% to 51%.<sup>24</sup> Population-based surveys can also be used to obtain information on the prevalence and distribution of diseases and disease risk factors in a population.<sup>25</sup> In NYS, three population-based surveys were analyzed to determine the proportion of lifetime asthmatics whose asthma was caused or made worse by work. Results ranged from 9.4% to 37.5% depending on the survey and how the work-relatedness questions were asked.<sup>26</sup> Difference in these estimates can be difficult to interpret in the absence of questions specific to exposures and work tasks. Because of the differences in methodology that can exist between studies and difficulties with interpretation of population-based estimates, state-based surveillance programs become a critical part of understanding WRA. A state-based surveillance program contributes to the understanding and prevention of WRA by systematically collecting data based on a set case definition, conducting follow-up with employees and employers, and developing intervention and prevention programs.

State-based surveillance programs often rely on physician reports of patients with WRA when conducting case ascertainment; however, health care providers often do not ask about workplace triggers when diagnosing and managing patients with asthma.<sup>27,28</sup> It is important that health care providers consider the possibility of workplace exposures when presented with an adult patient with either adult-onset asthma or worsening of current asthma. The diagnosis of WRA requires a

systematic and potentially time-consuming process that in addition to routine medical evaluations for asthma, involves the taking of objective work histories and questions to determine a temporal association between asthma and work. While this process may be complex, there is guidance available for physicians in the diagnosis and management of WRA.<sup>29</sup>

When making a diagnosis of asthma, it is important to distinguish between non-WRA and WRA, since the latter is a potentially preventable and reversible disease. If diagnosed early, WRA can be partially or completely reversed if exposures can be identified and properly stopped or controlled.<sup>29</sup> However, studies have shown that it can take years before a link is made between a person's asthma and the workplace.<sup>30,31,32</sup> This delay can have adverse effects on the worker. Research has shown that severity of asthma as well as the socioeconomic impacts can be greater for those with WRA than those with non-WRA. Adults with WRA are more likely to report more severe and less well-controlled asthma along with a decrease in earnings in comparison to adults with asthma unrelated to work.<sup>Error! Bookmark not defined.</sup><sup>33</sup> Moreover, 25 percent of adults with WRA will become unemployed and 44 percent will have to change jobs.<sup>34,35</sup> The comparison of WRA and non-WRA on health care utilization and asthma control has shown that individuals with WRA were more likely to report asthma attacks, visits to the emergency room, and hospitalizations.<sup>Error! Bookmark not defined.</sup><sup>36</sup> Hospitalizations can also be costly. In addition to these financial costs, victims of WRA also endure significant psychosocial costs including diminished physical, psychological, and family functioning.

Raising the awareness of occupational respiratory disease is important because even though occupational lung diseases are often incurable; they are always preventable. While the goal is to prevent all workers from developing occupational lung diseases, the identification of an occupational lung disease in a worker can have a profound impact on the health of co-workers and others working in companies within the same or similar industries. Because of this, it is important that health care providers report instances of occupational lung disease to the proper authorities so that proper intervention can occur.

State-based surveillance programs are recognized to be in the position to intervene and make recommendations on reducing and eliminating exposures, identify other important resources, and coordinate prevention activities with relevant partners. Improving ventilation, wearing protective equipment, changing work procedures, and educating workers are key factors for prevention.<sup>37</sup> Being able to assess co-workers at risk and work with individuals and companies to control or eliminate those risks before more disease occurs, is critical to the reduction of morbidity and mortality from occupational lung diseases. Translating findings and recommendations to other industries with similar exposure risks will further reduce the burden.

### Specific Aims

Aim 1. Maintain and enhance case ascertainment by expanding reporting to all occupational lung diseases

### **Methodology**

The NYSODH has had success enhancing the reporting of WRA to the OLDR, including the identification and acquisition of new data sources, as well as improved timeliness. The NYSDOH has the authority to collect information on occupational lung diseases under Part 22 of

the NYS Sanitary Code and can use this authority to collect information on all occupational lung diseases. BOHIP continues to provide data to NIOSH and will include all occupational lung diseases. The following describes each source used in the case ascertainment process.

- **Physician and Healthcare Facility Reporting:** Under Part 22 of the NYS Sanitary Code, every physician, health care facility and clinical laboratory in attendance on a person with clinical evidence of occupational lung disease must report such occurrence to the NYSDOH within 10 days. Information from physician and hospital reports were processed and additional information was obtained through patient interviews. We continued to raise awareness about the recognition and reporting of occupational lung diseases to improve reporting.
- **Hospital discharge data** is an invaluable resource to an occupational lung disease surveillance program. The frequent access to newly submitted data allows for a timelier identification of cases that may possibly need public health follow-up. Longer lag times, that other programs may experience, can hinder the ability to respond appropriately when needed. Also, having the discharge data reported directly to the NYSDOH, rather than an external entity, contributes to the ease of access.
- **NYS OHCN:** The OHCN is the nation's only publicly funded state-based occupational health clinic network. The clinics all use the same patient data software, and patient data are collected and maintained in a central database in BOHIP. Since BOHIP maintains the central database for the OHCN, no special access was needed to utilize this data source for case ascertainment. Cases were identified based on a respiratory disease diagnosis and an affirmative response in the work-related variable. Because the OHCN are experts in occupational diseases and have a coordinated, multidisciplinary approach to disease evaluation and prevention including IH and social work services, no further follow-up was conducted regarding cases identified through the OHCN.
- **Workers' Compensation:** We continued to work with the WCB to obtain the case numbers of occupational lung disease claimants. The case numbers will be used to access the electronic case files in eCase. The pertinent information will be extracted from the case files and inputted into our occupational lung disease database. If additional information is needed, or if the case would benefit from the services of either the OHCN or our industrial hygienists, further follow-up will be conducted.
- **Poison Control Centers:** There are two PCCs in NYS, the NYC Regional PCC and the Upstate New York PCC. Information and human exposure case data are continually uploaded to the National Poison Data System (NPDS) from the PCCs about every 19 minutes, providing a near real-time snapshot of poisoning conditions. NPDS can be used for surveillance purposes through a process called "toxicosurveillance" whereby users can set-up alerts that are triggered by a user-defined set of criteria. While the data does not include diagnosis, potential WRA cases were identified based on symptoms listed. By demonstrating the usefulness of the PCCs to identify cases of occupational lung diseases, we are establishing another important use of the PCCs which are often challenged with maintaining relevance.
- **All Payer Database (APD):** The APD will store data which is collected from all major public and private payers, such as insurance carriers, health plans, third party administrators, pharmacy benefit managers, and Medicaid. BOHIP worked with the NYSDOH Office of Quality and Patient Safety regarding its use in occupational health surveillance activities.

## **Results**

### Physician and Health Facility Reporting:

- A dedicated phone line is available to allow physicians' offices and hospitals to call in patient information.
- A physician reporting form is available and reports are received via fax, email and regular mail.
- A reporting form was also made available on the NYSDOH Health Provider Network, a secure system for communication between the NYSDOH and physicians and health facilities.

### SPARCS (i.e., hospital discharge and ED visit data):

- BOHIP continues to receive timely access to ED and hospital discharge data for case ascertainment.
- ED and hospital discharge data were used to identify potential cases occupational respiratory diseases.
- Medical records were obtained from the treating hospital for review. More detailed information on the circumstances of the inpatient stay or ED visit was obtained through this review. The data was abstracted and entered into the occupational lung disease registry database.

### Occupational Health Clinic Network:

- The OHCN software has been designed to flag cases that are reportable to the OLDR and has dedicated data collection screens to collect information specific to the OLDR and the WRA program.

### Workers' Compensation:

- BOHIP continues to utilize eCase to view the electronic case folders of claimants with occupational lung disease.
- List of lung disease claims from the WCB were periodically received and reviewed to identify WRA cases. Information was abstracted from the case files and medical records in eCase.

### Poison Control Centers:

- PCC alerts on all occupational poisoning calls are received on a real-time basis. Follow-up occurs if there are respiratory symptoms listed on the reports for inclusion in the occupational lung disease program.

### Behavior Risk Factor Surveillance System

- BRFSS is the world's largest, on-going telephone health survey system, tracking health conditions and risk behaviors in the US. NYS has used BRFSS to collect statistics on the prevalence of current and lifetime asthma since 1996 and added two questions on WRA for the first time in 2002. These questions have been asked every year since 1996 and 2002, respectively. Questions describing an individual's occupation and industry have been included every year since 2013, with plans to continue into at least 2021 and beyond.
- Data is used to analyze current asthma among workers by industry and occupation.

### Asthma Call-back Survey:

- Every year, beginning in 2006, NYS BRFSS respondents who had lifetime asthma were eligible to participate in the ACBS. In addition to the two WRA questions asked on the BRFSS, questions are asked about exposure to chemicals, smoke, fumes, or dust in their job. In addition, to help other states determine the prevalence of WRA in their state, BOHIP is the lead on the Occupational Health Indicator that uses the ACBS data. The WRA OHI calculates the ever-employed adults with current asthma who report that their asthma was caused or made worse by exposures at work. In NYS, in 2016, it was estimated that more than 650,000 ever-employed adults with current asthma reported that their asthma was caused or made worse by exposures at work.

### APD:

- Although BOHIP began work with the NYSDOH Office of Quality and Patient Safety regarding its use in occupational health surveillance activities, delays to the APD did not allow for much usage this grant cycle.
- Data on work-related asthma from the NYS OLDR was included in a publication on exposure to cleaning products titled, “Cleaning Products and Work-Related Asthma, 10-Year Update”, which was published in the Journal of Occupational and Environmental Medicine in February 2020. It was authored in conjunction with the other states conducting work-related asthma surveillance. The paper describes the frequency of work-related asthma and characteristics of individuals with exposure to cleaning products 1988 to 2012, compared with 1993 to 1997.
- ED data and hospital discharge data was used to identify more than 5,000 potential cases of acute occupational lung disease seen in the hospital since the onset of the project. Medical records were requested from the respective hospitals. Each case identified through the discharge data goes through an investigative process that includes medical record review as well as an interview with the potential case.
- More than 3,100 cases of work-related asthma have been submitted to NIOSH during the project period. This data is then aggregated with data from the other NIOSH-funded states conducting WRA surveillance for use in NIOSH’s research and for publication in the eWoRLD tables.
- On an annual basis, contact with over 300 potential work-related asthma cases is made by mail and/or phone to provide resources on occupational lung disease management and prevention, as well as information on the OHCN. Since the onset of the project, in total more than 1,800 people were contacted.
- Hospital occupational lung disease criteria documentation was updated to also include ICD10 codes. Hospitals continue to be educated about reportable ICD10 codes.
- NYS continues to be the lead on the work-related asthma occupational health indicator. The occupational health indicator documentation and how-to guide for work-related asthma was reviewed and updated.
- Pilot testing occurred for an expansion of the silicosis indicator to include review of death certificates for identification of priority-area silicosis cases.
- A worker health report utilizing NY BRFSS data, examined prevalence of current asthma by industry and occupation in order to examine groups with high current asthma prevalence who could benefit from work-related asthma education and prevention programs. The report,

“New York State Worker Health Chartbook Findings from the New York Behavioral Risk Factor Surveillance System, 2013-2016”, can be found on the NYSDOH webpage.

- Staff joined the Occupational Health Reportable Condition Knowledge Management System Workgroup. The Reportable Condition Knowledge Management System enhances public health reporting to the Department and aligns with national initiatives supporting interoperability and the implementation of electronic case reporting. NYS involvement in the workgroup will enhance the surveillance for, and health provider reporting of, occupational lung disease.
- A Master of Public Health graduate student intern was hired to assist work-related asthma staff on surveillance activities. The student was responsible for requesting medical records from hospitals and medical providers, identifying and abstracting pertinent work-related asthma variables from the medical records, following-up with hospitals and medical providers to ensure all records are submitted, entering the data into a database, and following up on cases via a telephone interview.

### **Discussion/Conclusions**

Although physicians were responsive to direct requests for additional information on a patient with a work-related respiratory disease, very few physicians spontaneously reported a case that was not already identified within the system by another data source. Therefore, it is important to build a surveillance system for work-related respiratory disease that includes methods to obtain information from secondary data sources including OHCN data, hospital discharge or ED data, workers' compensation data and PCC data. Without the direct reporting by a physician, it can be an arduous process involving multiple steps to determine if there was a health care diagnosis of asthma and an association with work.

**Aim 2.** Improve recognition and diagnosis of occupational lung disease among health care professionals.

### **Methodology**

Because a successful physician-based surveillance system is contingent upon physicians being able to recognize a work-related condition, BOHIP recognizes the importance of conducting outreach and education to health care professionals. BOHIP will use previously developed materials, as well as new materials, in its outreach efforts.

The secondary data sources (Aim 1) were used to identify physicians who may have been in attendance of a case of occupational lung disease. To raise awareness about their reporting obligation, these physicians were sent information about the OLDR and reporting requirements. Information about reporting occupational lung disease cases was also provided to all hospitals in NYS.

Digital and social media campaigns are used to deliver WRA messaging to health care providers to remind them to talk to their patients about the dangers of work-related asthma. These campaigns use click to website ads on Facebook and LinkedIn sponsored ads.

BOHIP utilized the OHCN to raise awareness of WRA. BOHIP meets quarterly with the OHCN, and also communicates via list serves and the SharePoint site. Whenever applicable,

occupational lung disease activities and products were shared with the OHCN, with requests that these items also be shared with their advisory boards.

We had proposed to make presentations regarding WRA, the OLDR, and prevention activities associated with occupational lung disease to regional medical conferences and to medical students. Unfortunately, BOHIP lost its on-staff occupational medicine physician who was to assist with these educational efforts. However, physicians from the OHCN have made presentations regarding WRA to medical students on an annual basis.

## **Results**

- Over 1,000 physicians identified as possibly having been in attendance of a case of occupational lung disease were sent information about the OLDR and reporting requirements.
- Information about reporting occupational lung disease cases, including WRA, continues to be provided to hospitals in NYS. The outreach typically includes information on the OLDR, the NYS reporting requirements, the types of cases reportable, and information on HIPAA compliance.
- The Occupational Lung Disease website underwent revisions to improve visibility and access to information, including resources for consultation and referrals and tools for recognizing and diagnosing WRA.
- A digital media campaign was implemented to help direct physicians to information and resources on the recognition and diagnosis of work-related asthma, as well as information on taking an occupational health history.
- Information on work-related asthma and resources for school employees was provided to the NYSDOH's Clean, Green, and Healthy Schools program.
- Information and factsheets on Flu Immunization and Day Care providers was provided to the NYSDOH Bureau of Immunization.
- The Public Health Live webcast on the recognition and diagnosis of work-related asthma (WRA) was disseminated to the Association of Asthma Educators, the American Board for Occupational Health Nurses, the American Association of Occupational Health Nurses, the American Medical Association, the American College of Physicians, the American Academy of Physician Assistants, and the American College of Occupational and Environmental Medicine. Follow-up will occur with these entities to evaluate the usefulness of this webcast and the interest in receiving other materials.

An outreach campaign regarding silicosis and mining was distributed to physicians in ten counties with the largest number of surface mines. The mailing includes information about the number of mining operations in their community, information for the physician on silicosis and workers at risk, and a tip sheet for mine workers on silica exposure and the risk of silicosis. In addition, links to resources on the NYSDOH website were provided, including information about the NYS Occupational Health Clinic Network, which is an excellent resource for patient consultations and referrals.

## **Discussion/Conclusions**

Educating health care providers about the possibility of workplace exposures when presented with an adult patient with asthma can have significant impact on the health of the patient. Recognizing and identifying workplace triggers, is an essential step in the elimination or control of the job exposure.

**Aim 3.** Develop educational material and outreach strategies to increase the recognition and awareness of occupational lung disease among adults.

## **Methodology**

The NYSDOH's "*Is York Asthma Work-related*" brochure continues to be used to assist asthmatics in determining if their job is causing or making their asthma worse and learn what steps they can take to manage their asthma at work. The brochure is also available in Spanish.

Staff began work on an awareness campaign to run at independent pharmacies in Albany County, New York in the Spring of 2020. The campaign consisted of a tear-off flyer that will be distributed to current asthma patients to make them aware of asthma triggers and encourage them to talk to their physicians about any workplace triggers that they believe they are being exposed to on the job. The campaign will slated to run in at least five independent pharmacies that serve a lower income population. It will be run for three months with the goal of at least 100 flyers distributed per month in each location. The campaign will also provide asthma patients with a link to the DOH's work-related asthma webpage. Unfortunately, due to the COVID-19 pandemic, this project was temporarily suspended.

In conjunction with the in-pharmacy campaign, staff worked to revise the current work-related asthma brochure which is also located on the DOH's work-related asthma webpage. Unfortunately, due to the COVID-19 pandemic, this project was put on hold.

Methods for disseminating WRA prevention materials included the NYSDOH website, our partners including the Asthma Partnership in NY, and targeted mailings. Information and materials were made available through the OHCN and their advisory boards. Relevant prevention materials were provided to cases post-interview when needed.

## **Results**

- Facebook, Twitter and Instagram are being used to reach people who either have work-related asthma or are at risk for developing work-related asthma. The social media campaign directs people to further information and available resources.
- Banner ads are embedded ads with images and text on a web page that attract traffic to a website. Work-related asthma banner ads were placed on websites frequented by healthcare providers. The ads linked to the work-related asthma resource on the NYSDOH website. There were over 2.0 million impressions and more than 5,000 clicks on the banner ads during the 2018, 2019 and 2021 campaigns.
- Facebook sponsored ads were utilized to deliver work-related asthma messaging to healthcare providers. The content of the ad delivered a short message on diagnosing work-related asthma and links to the NYSDOH website. There were more than 440,000 impressions and 3,600 clicks on the ads during the campaigns run in 2018, 2019 and 2021.

- An educational campaign on the symptoms and causes of work-related asthma was targeted to low-income New Yorkers using click to website ads on Facebook and Instagram. There were 1.4 million impressions and 12,400 clicks on the ad that linked to the NYSDOH website in 2018, 2019 and 2021, with more clicks occurring among females and older New Yorkers.
- Google and Bing search ads targeted people searching for information on asthma and trouble-breathing on the internet. Ads, such as “Work Triggering Your Asthma? Learn More About the Causes” with a link to the NYSDOH website, would appear if a person searched an asthma related keyword. The ad appeared more than 27,000 times during the 40-day campaign period in 2018, with 702 people clicking on the ad linking to the NYSDOH website.
- The Silica and Road Construction fact sheet was updated to increase road construction worker awareness concerning occupational silicosis and crystalline silica exposure.
- The Occupational Lung Disease website was updated to make the information more easily accessible. where people can get answers to common questions and access available resources.
- During the project period, over 10,000 English copies and 1,000 Spanish copies of the “*Is Your Asthma Work-related?*” brochure was distributed through the NYSDOH Distribution Center. The distribution center responded to requests from individuals, as well as organizations, interested in utilizing our information in their WRA prevention efforts. The brochure was also available for viewing and downloading from the NYSDOH website.
- Through a partnership with the NYSDOH Asbestos Safety Training Program, educational materials on WRA, as well as smoking cessation, continue to be provided to workers who receive training for asbestos abatement. These workers included those conducting asbestos abatement, along with workers in fields such as construction, plumbing and maintenance.
- Adults identified as possibly having work WRA were sent the “*Is Your Asthma Work-related?*” brochure, “*Asthma Trigger Tracker and Key Questions: Tools for Your Next Asthma Check-up.*”, and information on the OHCN.
- The Healthy Capital District initiative was provided with resources on occupational lung disease, including WRA, for use in their work.
- Information on WRA was provided to a member of the American College of Preventive Medicine’s committee to address the Centers for Disease Control and Prevention 6|18 initiative which targets six common and costly health conditions, including asthma.

### **Discussion/Conclusions**

Patients who are informed with health information about their condition can influence their own outcomes and treatment. Therefore, it's important to not only educate physicians about WRA but to also educate adult asthmatics. Tools such as the “*Is Your Asthma Work-related?*” brochure and “*Asthma Trigger Tracker and Key Questions: Tools for Your Next Asthma Check-up.*” are important to help assist workers in identifying a work-related exposure as a potential trigger for their asthma. It also gives patients a basis to begin a dialogue with their physician to better understand their asthma. Digital media has proven successful in delivering information to the high-risk populations. The publication and dissemination of surveillance data, and sharing of expertise and knowledge, is important to further external surveillance and research needs.

**Aim 4.** Utilize registry reports and surveillance data to guide public health interventions.

### **Methodology**

All reported cases of WRA, other select reports of acute occupational lung disease, and chronic occupational lung conditions involving a patient under the age of 50 were sent a pre-notification letter and assigned for a telephone interview. Determination of follow up for other acute occupational lung disease was based on the severity of disease and concerns over an on-going exposure that needs intervention.

Information on work lung diseases was collected utilizing BOHIP's questionnaire. Besides collecting information on the patient and the circumstances of exposure, the interview is used to provide education to the patient about methods to limit exposure, and appropriate prevention materials will be sent to the individual. Industrial hygiene staff are available to answer questions, if needed. We also developed a second brief questionnaire that could be mailed to those individuals who were unreachable via telephone, to garner the minimum information needed to confirm and classify the case, however responses were rarely received. NIOSH's established guidelines for confirmation and classification of WRA cases was utilized.

All interviews conducted were reviewed by an epidemiologist and/or an industrial hygienist to determine if follow-up with the company was needed. Company contacts were made only if the case's permission was obtained during the interview. When indicated, IH staff attempted to contact the company to determine the circumstances of exposure, identify if additional workers were at risk and if appropriate techniques for reducing exposure were in place. The industrial hygienists assisted the employer in developing or improving appropriate health and safety programs to minimize exposures and prevent future exposure-related health effects. Depending on the severity or persistence of the problem, or the uniqueness of the source of exposure, BOHIP attempted to conduct an on-site industrial hygiene evaluation. An important focus for these efforts is smaller businesses that do not have either full-time medical or industrial hygiene staff to evaluate their worksites.

### **Results/Accomplishments**

Industrial hygiene staff provided over-the phone technical assistance to individuals and companies in controlling workplace hazards. They also provided can provide site visits to observe work processes, evaluate exposures, and make recommendations. An industrial hygiene site visit often includes meeting with company representatives, conducting a walk-through survey of the facility, collecting air and bulk samples, interviewing workers, and reviewing the company's written health and safety programs. New companies reported to the OLDR are sent information on the availability of NYSDOH industrial hygiene services as well. Consultations during this funding period included:

- nail and beauty salons
- thermal injection molding for plastics
- cooling tower workers
- schools
- auto and scrap metal recycling
- electronic recyclers
- utility workers

- surface mine workers
  - Post Office workers
  - Correctional officers
- With enforcement of the new OSHA Silica rule, follow-up with management staff at a local mine was conducted to remind them that exposures evaluated at the facility exceeded the new standards and reiterated actions needed to achieve compliance.
  - The NYSDOH Cleaning Product Safety Cards that encourage asthma friendly cleaning practices, were distributed to essential workers at-risk of exposure to cleaning agents, during the COVID-19 pandemic. The cards are designed to be easily hung on cleaning carts. The safety cards are available on the NYSDOH website as well as through the NYS distribution center.
  - Cases are routinely reviewed by epidemiology and/or industrial hygiene staff to determine the need for further follow-up. They were provided with resources on occupational lung disease, as well as information about the NYS OHCN. These cases will be used to guide intervention activities in the coming year.

### **Discussion/Conclusions**

BOHIP has demonstrated the capacity and experience to conduct worker and company follow-up and provide intervention services to help prevent ongoing or future exposures, and to protect other persons who may be at risk. BOHIP has provided phone consultations to hundreds of workers on a variety of issues including indoor air quality concerns, beauty salon products, cleaning products, stone sealers, silica exposure, poultry processing, diacetyl, isocyanates, asbestos abatement, respirator fit testing, COVID-19 and right-to-know. They have conducted on-site investigations in many work settings ranging from recycling facilities to beauty salons.

BOHIP has had success in identifying opportunities for intervention and prevention, conducting outreach, and coordinating prevention activities with relevant partners. A multifaceted approach was used to accomplish many initiatives, including leveraging partners and their resources.

**Aim 5.** Help prevent ongoing or future exposures by recommending best work practices in identified high-risk occupations and industries.

### **Methodology**

BOHIP is well equipped to identify high risk industries and new exposure sources. By conducting workers and company follow-up, BOHIP can identify at-risk workers and protect both the worker as well as others who may be at risk. By utilizing partnerships with other NYSDOH programs, NYS agencies, the OHCN, OHCN advisory boards, regional and local health departments, NIOSH, and other federal agencies, BOHIP can identify areas where to recommend best workplace practices.

Epidemiology staff run descriptive statistics on the aggregate OLDR data looking for similarities by employer, industry, and exposure. Aggregate data is used to identify an industry or an exposure that warrants further outreach.

Baseline information is collected on companies contacted for industrial hygiene intervention either by telephone or site visit, will be data entered into a database. In addition to data collected from the survey described above, the database will include details about the companies' characteristics (e.g., size, industry type and location), current work practices and processes, identified hazards, and specific elements of their health and safety program or other data elements.

## Results

- Legionnaire's disease is a serious lung disease typically attributed to hot tubs, showers, or air conditioning units in large buildings and occurs most frequently in older adults and people with weakened immune systems. There is a lack of information detailing occupational settings as sources of Legionnaire's Disease, as well as its occurrence among healthy young workers. Staff investigated the Legionnaire's Disease death of an outdoor utility construction worker. The worker was exposed to outdoor standing water daily, experienced numerous respiratory distress events and finally symptoms of Legionnaire's Disease which were not identified and treated properly. By the time hospital staff realized that the worker symptoms were Legionnaires Disease, the progress was irreversible, and the patient succumbed to his illness. This case was originally denied by the NYS WCB, but staff provided information on outdoor worker exposure to standing water and legionella bacteria, including NYS BOHIP work with NIOSH on health hazard evaluations of legionellosis in outdoor automobile shredding workers as well as other worker links, leading the NYS WCB to revisit the case and reverse their decision. The research work performed is being used by WCB judges in current pending cases to assess causal work relationships.
- A list of NYS industries engaged in thermoplastic injection molding using appropriate North American Industry Classification System (NAICS) codes was generated. A survey to gather information on thermoplastic injection molding and the materials used in this process is being finalized and will be distributed to companies in this industry. The survey questionnaire requests information on raw materials, process specifications, control measures, concerns and best practices. The analytical data will be evaluated to determine the potential for exposure to respiratory hazards in the thermoplastics injection molding industry. Occupational hygiene assessments using BOHIP's consultative industrial hygiene services will be offered by the mailer. A second round of survey solicitation has begun. Unfortunately, this project was put on hold due to the ongoing COVID-19 pandemic.
- Past fatality investigation data on three methylene chloride deaths in NYS was used to initiate and support legislation to ban methylene chloride in NYS, including proposals for use of existing alternative paint strippers. This information was also shared with Council for Occupational Safety and Health (COSH) groups, and non-government worker and environmental health advocates, in a week of action campaign in more than a dozen states, including New York, to ban paint strippers from big box stores. It has resulted in three major retailers announcing they would stop selling paint strippers containing methylene chloride and N-methylpyrrolidone chemicals. More than 60 professionals and do-it-yourselfers have died after inhaling methylene chloride since 2000.
- As mentioned in Aim 4, companies, when identified, are offered a site visit and free industrial hygiene consultative services at their facility.

- Staff collaborated with internal and external partners on community and occupational health concerns regarding respiratory and combustible dust hazards during ferrite manufacturing in NYS.
- Staff reviewed the Federal Register related to OSHA’s new direct rule, “Revising the Beryllium Standard for General Industry” and its impact on New York workers. Occupational exposure to beryllium can result in lung cancer and chronic beryllium disease. Beryllium exposure can occur in many industries, such as semiconductor fabricators, dental laboratories, ceramics manufacturing, foundries, and downstream metalworking processes.
- Best work practices are being developed for nail salons and the presence of respiratory hazards are being evaluated in this industry.
- Respiratory protection recommendations and training were provided to workers assigned to inspect cooling towers for legionella bacteria.
- Information on occupational lung disease and its relevance to low income and vulnerable workers was provided to the NYS Worker Exploitation Task Force for consideration in their focus areas.
- A close working relationship with the OHCN has allowed us to utilize their services to identify cases, distribute materials, and provide expertise regarding WRA.
- A new resource page on the NYSDOH website was developed on Silicosis and Crystalline Silica Exposure. This website has background information on silicosis, as well as information specific to for health care providers, miners, mine operators, and other industries.
- Staff worked with the Bureau of TB Control and the County Deputy Health Commissioner regarding a confirmed TB case at the local county jail. The ventilation system was reviewed to assist in identifying others in the jail population who may have been exposed.
- Staff worked with the Bureau of TB Control regarding a TB investigation at a Post Office. Ventilation systems were reviewed to assist in identifying other workers who may be at risk.
- Industrial hygiene staff attended a site visit with staff from the NYS Department of Environmental Conservation (DEC) and BTSA. Fair-Rite Products Corp. manufactures ferrite cores for electronic noise cancellation in electrical products. The facility has been the topic of community health complaints and DEC permits the manufacturer’s emissions; onsite activity in occupational health expanded from this activity. Previous site visits from DEC staff had indicated potential respiratory hazard exposure to employees during the manufacturing process.
- Industrial hygiene staff were consulted by a Capital District region hospital to develop occupational exposure bands for waste anesthetic gas exposure. Waste anesthetic gases are small amounts of volatile anesthetic gases that leak from the patient’s anesthetic breathing circuit into the air of operating rooms during delivery of anesthesia.
- Industrial hygiene staff worked with industrial hygienists from the NYS Occupational Health Clinic Network and a physician from University of Iowa Hospitals and Clinics, related to a case study of a millwork employee with a complex lung disease diagnosis.
- BOHIP staff received an inquiry related to occupational ferrite exposures. In the production of magnetic ceramics for ferrite production, workers are exposed to mixed dust environments that can pose respiratory hazards. IH staff conducted two phone

interviews to collect information about the work process, dust composition and health concerns. One was an interview of a former employee with approximately 40 years of exposure; this worker was referred to the Occupational Health Clinic Network, related to the lung effects discussed.

## **Occupational Injury Prevention Products Developed by NYS Occupational Lung Disease Program**

### **Presentations**

Silicosis and Mining, New York State Department of Health's Center for Environmental Health Director Rounds, Albany, NY September 2016.

### **Publications**

- Cleaning Products and Work-Related Asthma, 10 Year Update. Rosenman, K; Reilly; Pechter, E; Fitzsimmons, K; Flattery, J, Weinberg, J; Cummings, K; Borjan, M; Lumia, M; Harrison, R; Dodd, K; Schleiff, P. Journal of Occupational and Environmental Medicine. 62(2):130-137, February 2020. doi: 10.1097/JOM.0000000000001771
- NYSDOH. New York State Worker Health Chartbook Findings from the New York Behavioral Risk Factor Surveillance System, 2013-2016.  
[https://www.health.ny.gov/statistics/brfss/reports/docs/nys\\_worker\\_health\\_chartbook\\_2013-2016.pdf](https://www.health.ny.gov/statistics/brfss/reports/docs/nys_worker_health_chartbook_2013-2016.pdf)

### **Fact Sheets**

- NYSDOH. Silicosis and Silica Exposure: What Physicians Need to Know.  
<https://www.health.ny.gov/environmental/investigations/silicosis/docs/provider.pdf>
- NYSDOH. Silicosis and Mining: Information for Workers.  
<https://www.health.ny.gov/environmental/investigations/silicosis/docs/worker.pdf>
- NYSDOH. Silica and Road Construction.  
[http://www.health.ny.gov/environmental/workplace/lung\\_disease\\_registry/docs/silicosis\\_road](http://www.health.ny.gov/environmental/workplace/lung_disease_registry/docs/silicosis_road)
- Is Your Asthma Work Related? brochure  
<https://www.health.ny.gov/publications/2775/index.htm>

## Cumulative Inclusion Enrollment Report

**Study Title:** Occupational Health and Safety Surveillance and Intervention in New York State

**Comments:** Occupational Lung Disease

Racial Categories	Ethnic Categories									Total
	Not Hispanic or Latino			Hispanic or Latino			Unknown/Not Reported Ethnicity			
	Female	Male	Unknown / Not Reported	Female	Male	Unknown / Not Reported	Female	Male	Unknown / Not Reported	
American Indian/ Alaska	5	0	0	1	0	0	0	0	0	6
Asian	16	16	0	0	1	0	0	0	0	33
Native Hawaiian or Other Pacific Islander	0	0	0	0	0	0	0	0	0	0
Black or African	207	129	0	12	8	0	6	4	0	366
White	250	419	0	16	28	0	7	10	0	730
More Than One Race	1	8	0	2	10	0	2	0	0	23
Unknown or Not Reported	49	44	0	81	67	0	28	34	0	303
<b>Total</b>	<b>529</b>	<b>616</b>	<b>0</b>	<b>112</b>	<b>114</b>	<b>0</b>	<b>43</b>	<b>48</b>	<b>0</b>	<b>1,461</b>

## **Abstract- Fatality Control Assessment and Evaluation**

Every year approximately 250 New Yorkers die from work-related traumatic injuries (1992-2018). These tragic deaths cause enormous and long lasting emotional and financial hardship for the victims' families, workplaces, communities, and society as a whole. These deaths are all the more tragic because they are largely preventable. In collaboration with NIOSH, the NYSDOH has been conducting the New York State Fatality Assessment and Control (NY FACE) program since September 2001. The program has been conducted primarily in upstate New York (all of NYS, excluding NYC). The ultimate goal of the NY FACE program is to reduce the occurrence of work-related non-fatal and fatal injuries by establishing a strong workplace safety culture through changing the knowledge, attitudes and behaviors of individuals within the NYS working community. This report summarizes the program activities, outcomes, impact, significant findings between July 2015 and August 2021.

Program aims:

**AIM 1.** Conduct active surveillance to collect accurate and complete workplace fatal injury data to lay a foundation for intervention.

**AIM 2.** Identify causal and contributing factors through in-depth research including case investigations and develop effective intervention measures.

**AIM 3.** Transform research findings into practical injury prevention products.

**AIM 4.** Disseminate the injury prevention products statewide and promote adaptation and implementation through collaboration of partners.

**AIM 5.** Assess the impact of NY FACE program and evaluate the effectiveness of injury prevention products.

We completed our study on woodchipper related fatal injuries and started a research project on solid waste worker deaths involving sanitation trucks. We continued disseminating *Logging Safety: A Field Guide* to at-risk populations to help prevent tree-work related worker deaths.

NY FACE identified 465 work related fatalities and completed and delivered a total of 31 intervention products including fatality reports, a peer reviewed journal article, trade magazine articles, interactive worker fatality maps, hazard alert sheets, Youtube videos, presentations, and posters on varied worker safety and injury prevention topics. These products helped to raise the awareness of workplace hazards and prevention measures among the stakeholders as well as the public. The NY FACE injury prevention products have been widely recognized and used for developing safety programs and worker training materials. NY FACE has successfully developed an extensive network of partners who help disseminate the injury prevention message to the target populations and make workplaces safer for workers.

## Section 1. Significant Findings, Project Outcomes, and Impact

### **Significant Findings**

- 1) Young and inexperienced workers are at higher risk for fatal injuries while operating woodchippers, and the current feed wheel control mechanism is not effective for workers to self-rescue.

NY FACE completed a study of 113 woodchipper-related worker deaths (US, 1982-2016). The study found that young and inexperienced workers may be at higher risk for caught-in deaths. The current feed wheel control devices are not effective for workers to self-rescue. Fully automatic feed wheel stop devices are needed to prevent caught-in incidents.

- 2) Solid waste collection workers are at high risk for fatal injuries when they ride the sanitation trucks on the exterior riding steps.

NY FACE identified and studied approximately 600 cases of solid waste worker deaths involving sanitation trucks. We found that approximately 25% of the victims were killed while riding the exterior riding steps (US, 1984-2019).

### **Translation of Findings:**

- 1) The woodchipper study found that the 113 victims were killed in struck-by (57), caught-in (41), motor vehicle (7), electrical (4), fall (2), and heat stroke (2) incidents while performing chipper-related tasks (US, 1982-2016). The study concluded that Chipper-related worker deaths are preventable. Young and inexperienced workers may be at higher risk for caught-in deaths. The current feed wheel control devices are not effective for workers to self-rescue. Fully automatic feed wheel stop devices are needed to prevent caught-in incidents. These findings can be used for raising awareness of the hazard, developing proactive prevention measures and employee training materials, and promoting more effective engineering controls.
- 2) Workers have been killed every year while riding the exterior riding steps on sanitation trucks. Currently there is no OSHA standard addressing the hazards associated with refuse collection and compaction vehicles, specifically the practice of riding the exterior riding steps. OSHA uses its general duty clause to cite employers for violations of the American National Standards Institute (ANSI) standard (Z245.1-2017). The ANSI Standard requires that no worker rides the exterior riding steps when the vehicle is backing up, travelling faster than 10 miles per hour, or more than 0.2 miles in distance. The findings of our study can be used to raise the awareness of the hazard, assess whether the current safety regulations are adequate and effective to prevent worker fatal injuries, and encourage employers to stop the practice of riding exterior riding step.

### **Outcomes/Impact:**

- 1) Prevent woodchipper-related worker deaths

- Following the publication of the NY FACE's research article, the Pump Handle, a public health blog posted an article written by Dr. Celeste Monforton (<http://www.thepumphandle.org/2018/10/31/wood-chippers-worker-deaths-failing-to-adopt-safer-technology/#.W-B32HmWxaQ>). The article "Woodchippers, worker deaths, failing to adopt safer technology" highlighted the NY FACE research: "Thumbs up to" NY FACE "for their analysis of woodchipper fatalities. They get a big high five for amplifying the important

message that engineering controls—such as sensing devices that can shut down the feed wheels on a woodchipper—are the most effective way to save workers’ lives.”

- The owner of a tree service company in California wrote to NY FACE to comment on the woodchipper research paper: “I read your report on woodchipper and tree safety. I believe you are spot on in your findings. I have petitioned California OSHA for stronger regulations on woodchipper safety. The petition was started in August of 2015. I specifically targeted passive safety to provide the woodchipper operator with the safety they need. Petition 549 was unanimously passed by the OSHA board in Jan of 2016. Cal OSHA is forming an advisory committee then is to convene the 3rd week of Jan 2019 in Sacramento California. Your report is very much appreciated as it can be used in the upcoming advisory committee meeting.”
- The Director of Health and Safety for NYS Department of Environmental Conservation (DEC) contacted NY FACE to request a copy of the woodchipper research article and information on chipper feed control devices. NYSDEC employees use woodchippers. The Director considered that the paper raised a very important worker safety issue. He intended to inquire with vendors/manufacturers about better and safer feed control features for worker protection.
- The Senior Advisor for Safety, Compliance & Standards of Tree Care Industry Association (TCIA) shared our study findings with a work safety discussion group on Facebook. TCIA is a trade group representing over 2,300 tree care firms and affiliated companies.
- The Senior Advisor stated that TCIA could make great use of the research findings.

## 2) Prevent fatal injuries among sanitation workers

- Staff reached out to Civil Service Employees Association (CSEA), a labor union representing approximately 300,000 employees in New York’s state and local governments, as well as school districts, child care businesses, and the private sector companies in New York State to propose collaboration in occupational injury prevention research. CSEA agreed to partner with NY FACE in the study of solid waste collection worker injuries including both fatal and nonfatal injuries. CSEA provided municipal sanitation worker injury and illness records to NY FACE and will assist NY FACE investigations with fatal incidents involving CSEA solid waste workers.
- NYS legislation was initiated and passed in 2017 to include sanitation trucks in the SLOW DOWN, MOVE OVER law. This legislation was the result of staff working with Hispanic worker advocates and a legislator. Staff presented occupational fatality data at several Workers’ Memorial Day events across the state. The data showed that Hispanic sanitation workers were at high risk for serious injuries. Hispanic worker advocates were particularly interested in the death of a young Hispanic sanitation worker in Suffolk County and approached a legislator for assistance. The legislator contacted staff for data on sanitation worker deaths across NYS. Staff provided the data indicating traffic risk for sanitation workers statewide, and the data was used to support the legislation.

## 3) Use of Logging Field Guide Developed by NY FACE

- A NYSDEC trainer taught chainsaw safety every year. He also taught a chainsaw safety course at New York Wildfire and Incident Management Academy. Wildland firefighters and incident managers across the nation attend the four-day course every summer. The trainer gave each student a copy of the Field Guide. He considered that the Field Guide was

excellent for the trainees to learn the OSHA requirement on personal protective equipment and the proper chainsaw cutting techniques.

- A Safety Specialist with the Risk Management of Multnomah County of Oregon used Field Guide and the FACE training manual “Preventing Deaths and Injuries to Public Workers while Working around Mobile Equipment” for worker training. The county workers were exposed to both mobile equipment- and chainsaw-related hazards at job.
- The Director of the Bureau of Safety and Health of NYS Parks Recreation & Historic Preservation (NYS Parks) considered that the Field Guide was a “very helpful resource”. The Logging Field Guide was added to the NYS Parks’ training orders that were given to all regional safety managers. It also has been used for NYS Parks’ new hire, ongoing, and refresher training.

## **Section 2. Scientific Report- Fatality Control Assessment and Evaluation**

### **Background:**

New York is the fourth most populous state in the US with just over 19.5 million residents including approximately 9.5 million in civilian labor force working in manufacturing, construction, transportation, and retail trades to agriculture, forestry, fishing, mining, and oil and gas extraction.<sup>38,39,40</sup> Due to its size and diverse nature, the state is often divided into two regions for analytical purposes and the provision of government programs: upstate New York (Upstate) which includes all regions of NYS excluding the five counties of NYC and NYC.

Work-related fatalities occur every year in NYS. Between 1992 and 2018, there were 6,756 work-related fatal incidents in NYS averaging 250 deaths per year.<sup>41</sup> NYS had 271 workers lose their lives to workplace incidents in 2018, among which 27% (73) died in NYC while the rest (73%) died in Upstate.<sup>42,43</sup> The distribution of NYS labor force was 45% (4.3 million) in NYC and 55% (5.2 million) in Upstate.<sup>40,44</sup> The leading cause of work-related deaths in NYS was transportation incidents claiming 67 workers’ lives (24.7%) in 2018.<sup>45</sup> The second leading cause was fatal falls (59, 22%) followed by fatal contact injuries (56, 20.7%). Compared to the US population, workers in the construction industry in NYC are at high risk for occupational fatal injury (Table 1). NYC workers in transportation and warehousing industries suffered disproportionately high percentages of total annual fatal injuries compared to their employment percentages. Workers in Upstate are at increased risk for fatal injuries in agriculture and forestry, construction, and transportation and warehousing industries.

Self-employed workers or workers in family businesses represented 6% of the total state labor force in 2018; yet this group suffered 22% of total annual fatalities.<sup>40,45</sup> The annual fatality rate (number of fatal cases per 100,000 full-time workers) for the self-employed or workers in family businesses was 21.5, five times the fatality rate for the wage and salary workers which was 2.4.<sup>40,45,46</sup>

Compared to Whites in NYS, Hispanic workers in NYS account for a disproportionate percentage of those working in occupations at high risk for occupational mortality. For example, more Hispanic workers are employed as landscapers/groundskeepers or as farm hands.<sup>47</sup> The fatality rate for landscapers or groundskeepers is 20.2 while the fatality rate for agricultural workers is 24.7 compared to the fatality rate of 3.5 for average workers (U.S., 2018).<sup>48</sup> Two

other occupations, construction/extraction and transportation/material moving that have high fatality rates (12.2 and 15.0, respectively) also employ high percentages of Hispanic workers.<sup>47,48</sup> Hispanic workers in NYC represented 27.7% of the region’s labor force, yet they suffered 34.2% of total NYC annual fatal injuries in 2018.<sup>43,44</sup>

Compared with their percentage of employment in the labor force, older workers suffer a disproportionately high number of annual fatal injuries than workers in younger age groups in NYS. For example, workers who are in the age group 55-64 suffered 21.8% of the total annual fatalities while accounting for 17.6% of the labor force in 2018.<sup>45,47</sup> Among all age groups, workers who are 65 years and older suffered the highest percentage of annual fatal injuries of 23.6% while they only represent 6.9% of the labor force.<sup>45,47</sup>

Table 1. Percentages of Fatalities and Employment by Industry in NYC, NYS, and US (2018)  
49,50

Industries	NYC			NYS			US		
	Fatality Rate (overall rate 2.0)	Fatality %	Emp. %	Fatality rate (overall rate 3.1)	Fatality %	Emp %	Fatality Rate (overall rate 3.5)	Fatality %	Emp. %
Agriculture, forestry, fishing and hunting	--*	--	--	29.3	7.7	0.8	23.4	10.9	1.6
Mining	--	--	--	--	--	--	14.1	2.5	0.5
Construction	10.0	30.1	3.5	10.5	21.4	6.3	9.5	19.2	7.2
Manufacturing	--	5.5	1.6	2.9	5.9	5.8	2.2	6.5	10.0
Transportation and warehousing	3.6	12.3	3.2	7.5	12.2	6.0	12.4	17.2	5.5
Wholesale and retail	2.3	11.0	10.8	2.7	9.2	11.3	2.6	9.1	13.0
Information	--	--	4.4	--	--	2.4	1.2	0.6	1.9
Finance, insurance, real estate/rental	--	--	3.8	1.1	3.0	8.5	1.1	2.1	6.8
Professional and business services	1.1	8.2	16.3	2.9	10.7	12.5	3.3	11.1	12.2
Education and health services	0.7	6.8	21.3	0.7	4.8	27.2	0.7	3.2	22.5
Leisure and hospitality	--	5.5	10.5	2.0	5.2	9.5	2.2	4.8	9.2
Other services	--	0	4.0	3.7	5.2	4.7	2.6	3.7	5.0
Public Administration	3.6	13.7	13.1	3.1	13.3	4.9	1.8	9.0	1.6

\*below recording level

Life expectancy for the US population was 78.7 years.<sup>51</sup> One of the devastating impacts of occupational fatalities is that they most often occur well before the end of an individual’s natural

life span, robbing the most productive years from the victims. The negative impact on society of work-related fatal injuries occurring early in life can be quantified in terms of years of potential life lost (YPLL) before age 65 (YPLL<65).<sup>52</sup> We estimated YPLL<65 for all 271 NYS victims who died in 2018 conservatively by assigning all workers within each age group with the oldest age in that group, resulting in 3,132 YPLL<65. The dollar cost to society in lost future productivity can be estimated by multiplying YPLL<65 by the worker annual income. The dollar cost in lost future productivity due to the 271 premature deaths is well over \$200 million based on NYS mean annual income of \$65,610 in 2018.<sup>53</sup> The National Safety Council estimated that work-related deaths and injuries cost the nation, employers, and individuals \$170.8 billion in 2018.<sup>54</sup>

FACE is a research program designed to identify and investigate fatal occupational injuries and formulate prevention measures. NIOSH launched the FACE program in 1982. In 1989, NIOSH began funding state-based FACE programs. The NYSDOH, BOHIP received funding from NIOSH in September 2001 to conduct NYS FACE program in upstate NY.

**AIM 1. Conduct active surveillance to collect accurate and complete workplace fatal injury data to lay a foundation for intervention.**

**Methodology**

Daily on-line newspaper searches were conducted to identify occupational fatality cases. Additional case information was identified from death certificates. A dedicated toll-free phone line with an answering machine was used to receive calls and collect information on fatalities occurring outside normal business hours. Reports were received via fax or through the NYSDOH Center for Environmental Health's Environmental Helpline. The fatality information was entered into an electronic database (FACE database).

The FACE Access database compiled the case information with the ability to analyze the data and generate summary reports on predetermined target populations, industries as well as injury or event types. Periodic data/case reviews were conducted to ensure the accuracy of the data. NY FACE shared the occupational fatality data with stakeholders, partners and the public to raise the awareness of occupational hazards, proper engineering controls, safe work practices and other prevention measures.

**Results/Accomplishments**

- Staff identified 465 work related fatalities that occurred in upstate NY. Quarterly case reviews were conducted to ensure data quality and identify trends.
- Staff established a database in 2017 to record worker fatalities occurred in NYC area based on the worker monthly fatality summary provided by the NYCDOHMH. We also collected NYC worker fatalities through monitoring of news media outlets complied by Google Alerts. Staff continued collecting NYC occupational fatality data congruently with existing Upstate and Long Island data tracking and cataloging.
- Staff searched the OSHA fatality database and the internet to identify work-related fatality cases that occurred in NYC for 2015, 2016, and 2017. We identified a total of 33 cases for 2015, 35 cases for 2016, and 49 cases for 2017. We shared the case information with the NYCDOHMH injury prevention staff.

- Staff finalized 2015 and 2016 worker fatality data and submitted the data to EPHT who will develop interactive worker fatality maps. Staff compiled a total of 231 work related fatal cases that occurred in both upstate and NYC. Staff also reviewed each case to ensure that only the cases that were identified by public media sources were included. The data was used to develop interactive worker fatality map which was posted on the NYSDOH website.
- Staff reviewed the cases on the NY FACE database and identified 14 agricultural work-related fatalities involving youths (2002-2018). The victims' ages ranged from 8 to 21. The case information was provided to BOHIP staff who was researching a funding opportunity offered by Robert Wood Johnson Foundation.
- Staff provided Mr. Steve Kaplan, Assistant Regional Administrator for OSHA's Enforcement Program, with data on worker deaths related to woodchippers between 1992 and 2014. The data were used by OSHA to create a Safety and Health Information Bulletin.
- Under the mentorship and guidance of NY FACE staff, a University at Albany School of Public Health graduate student completed a Workplace Violence (WPV) Research Project. The project identified 411 WPV cases causing 501 deaths and 95 injuries (1988-2018, US) and reviewed a fatality case involving a social service worker being killed by a resident at a temporary shelter for adults in NYS. The project identified risk and contributing factors, recommended prevention measures based on the principals of Hierarchy of Controls, and proposed policy changes in occupational and public safety. The research findings were presented to the BOHIP, NYSDOH, and a poster was presented at the University at Albany School of Public Health.

### **Discussion/Conclusions**

Due to the persistent outreach efforts and partnership development, NY FACE has established a comprehensive surveillance system that provides timely, accurate and complete occupational fatality data. The collaboration with NYCDOHMH is beneficial for the program to monitor the occurrence and trend in worker fatal injuries and to disseminate the injury prevention products in NYC.

The Access worker fatality database is easy to use and can serve multiple functions. The database can generate fatal injury summaries by incident types, target populations, and industries based on pre-defined categories, which can be updated as needed for tracking new types of injuries or emerging high-risk populations. The database is a useful tool to conduct data analysis, identify and monitor the fatal injury trends and patterns, and generate injury data summaries to be shared with stakeholders.

### **AIM 2. Identify causal and contributing factors through in-depth research including case investigations and develop effective intervention measures.**

#### **Methodology**

NY FACE conducts three types of research activities to identify high-risk populations, hazards, causal and contributing factors, and effective prevention measures: 1) Study of data with specific case information; 2) Study of aggregated data; and 3) Study of individual cases through conducting fatality investigations.

To determine an evidence basis for targeted intervention, two types of data are needed: aggregate and individual case data. Aggregate data, such as those available from the BLS's CFI, can be used for overall trend analysis and risk assessment. However, aggregate data does not offer the descriptive information required to identify specific prevention strategies. Individual fatality case data, such as the OSHA Fatality Database, are vital when making evidence-based intervention determinations.<sup>18</sup> The best way to ascertain causal, risk, and contributing factors is through studying many individual injury cases to derive variables that can be used for industry- and job-specific data analysis. Investigation of individual cases allows investigators and researchers to gain firsthand case information which are vital to identify unique risk factors.

Preparations for investigation were initiated as soon as the case information was received. Investigations were conducted using Haddon Matrix, the Man-Machine-Environment model.<sup>19</sup> Investigators collected information associated with the agent (mode of energy exchange or direct causes), the host (worker who was killed as a result of the energy exchange), and the surrounding environment (physical and social aspects of the workplace) to reconstruct the timeline before, during and after a fatal incident to identify all contributing factors. Throughout the investigation process, the rights of the victim, family members, and co-workers were respected. Fatality investigation reports were written for every investigation in a format recommended by NIOSH. These reports were distributed immediately upon completion to employers and/or incident site owners, decedents' families upon request, appropriate labor unions, OSHA, and NIOSH. Immediately after a fatal incident, a company owner is usually extremely overwhelmed by taking care of the victim's family, consoling the employees, and dealing with enforcement inspections, insurance inquiries, and the potential legal consequences. Obtaining company's permission for a site visit can be very challenging since FACE is a research program, and participation is voluntary. Numerous companies have refused to cooperate with us. NY FACE continued to collaborate with OSHA to gain access to work sites. Often, we collaborated with agencies such as OSHA, Public Employee Safety and Health Bureau (PESH), or NYS Police to complete investigations without visiting incident sites when site visits are not possible due to company refusals.

## **Results**

- Nine fatality investigations were completed. NY FACE investigators collected information on company operations, safety programs, and employee training, interviewed the employers, witnesses and co-workers, observed, photographed, and documented the area of incident, and examined the equipment involved in the fatality. In addition to the site evaluations, investigators also collected information from a variety of external sources including equipment manufacturers, law enforcement agencies, county coroners and medical examiners, emergency responders, and OSHA and PESH investigators.
- Staff finalized a database of worker fatalities associated with mobile hand-fed woodchippers that occurred in the U.S. Cases were identified from four online databases: OSHA Fatality and Catastrophe Investigation Summaries, OSHA Reports of Fatalities and Catastrophes—Archive, NIOSH and State FACE Investigation Reports, and TCIA Accident Briefs. A total of 113 cases were identified (1982-2016). Staff utilized the data to develop a peer reviewed journal article.
- In responding to a fatality involving a sanitation worker falling off the sidestep of a sanitation truck, staff searched the NY FACE database and identified 36 cases of sanitation worker

deaths between 2002 and 2018. Ten of the 36 victims were killed after falling off sanitation trucks while riding on the sidestep. The information was shared with the PESH investigator and the employer, a town sanitation department in Long Island. The information was also used for developing injury prevention products.

- Staff started a research project on worker fatalities associated with refuse collection vehicles with a focus on the cases involving sidestep riding. The first round of data entry has been completed, and approximately 600 cases were identified from the OSHA and FACE databases (U.S.). Staff will continue collecting case information through available media, entering case information, and researching related safety regulations among the states with OSHA approved state plans.
- Staff spoke with the Chief of Staff & Vice President for Safety and Standards of the National Waste & Recycling Association (NWRA). NWRA is a trade association representing approximately 70 percent of the private sector waste and recycling markets in the U.S. Staff informed NWRA of the NY FACE effort in investigating and researching worker fatalities involving refuse collection trucks with a focus on the issue of sidestep riding. Six NY FACE reports on solid waste worker fatalities were sent to NWRA.

### **Discussion/Conclusions**

Our three-pronged approach (study of case specific data, study of aggregated data, and investigation of individual cases) has generated research findings and injury prevention products that helped employers and industries to develop proactive prevention measures as well as best practices. The NY FACE reports have been used by employers to develop employee training materials (see Results in Aims 3, 4, and 5). These investigations generated not only prevention measures for employers to adopt, but also recommendations for manufacturers to make machines safer using the concept of Prevention through Design.

Staff collaborated with OSHA during investigations. One standard step was to search the NIOSH FACE database for similar cases and share the FACE reports with OSHA safety compliance officers (SCO). The FACE reports often helped the SCOs better understand the cases and the risk factors.

### **AIM 3. Transform research findings into practical injury prevention products.**

#### **Methodology**

BOHIP developed the Intervention Product Development Model (IPDM, see Figure 1) to guide our effort on developing injury prevention/intervention products. Intervention product development involves multiple stages including idea generation, preliminary product research, market research for existing product, existing product modification, new product design, prototype or modified product pilot testing, and final product production. During the *idea generation* stage, NY FACE will identify the need for a specific product through reviewing fatal and non-fatal injury data. New OSHA regulations, stakeholder or partner interest, emerging industries, and new technology will also be driving forces for new product development. The focus of the *preliminary product research* is the need of the end users or the target population. NY FACE will research and learn about the target population's job hazards, common work practices, general attitude about safety, occupational culture, educational backgrounds, as well as ethnic and cultural backgrounds in order to generate relevant and specific product. Based on the

best product model determined in the previous stage, NY FACE will conduct market research to identify a suitable product, preferably having been tested and determined successful, for adaptation. Adopting or modifying an existing product makes more economic sense since it usually requires less money and staff time than developing a brand-new product from scratch. Using existing successful products can also shorten the product development process and get the product to the end users sooner. If a suitable product is identified, NY FACE will modify and repackage the product with the permission of the original owner. If no existing product satisfying the specific product criteria is identified during stage one, NY FACE will proceed to the new product development stage. A feasibility study will be conducted at this stage to assess if we have the technical and financial ability to develop the product and whether we need to allocate additional resources. Dissemination venues should be assessed as part of the feasibility study. One important step before final production is to pilot test the prototype with the target population. The product can be modified and improved based on the pilot testing results before final production. Partners and stakeholders, especially those representing the target populations will be consulted during each stage of product development.

FACE reports usually contain specific and detailed injury prevention information and are relevant to specific occupations or industries. To maximize the utility of FACE reports, NY FACE will continue to develop FACE FACTS, hazard alerts, posters, trade magazine articles, and presentations using NY FACE reports as well as reports in NIOSH FACE database. We will also review and revise the specific injury prevention measures to more general intervention practices that will be applicable to larger and broader working populations.

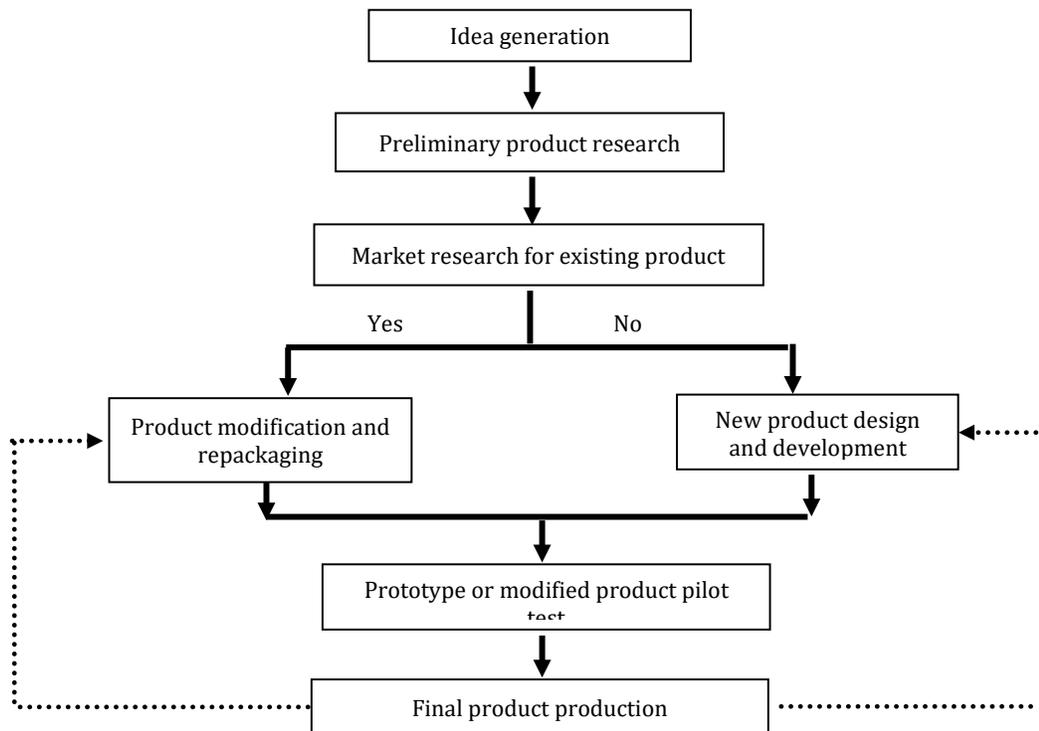


Figure 1. Intervention Product Development Model

## Results

- FACE staff worked with CFOI and EPHT staff to develop interactive worker fatality maps. The maps for 2013 and 2014 cases are now posted on the NY FACE webpage (available at [https://apps.health.ny.gov/statistics/environmental/public\\_health\\_tracking/tracker/index.html#/ohiWorkerFatalities](https://apps.health.ny.gov/statistics/environmental/public_health_tracking/tracker/index.html#/ohiWorkerFatalities)). These maps show the locations of the incidents and a brief incident description for each case. Viewers can create specific maps by sorting the cases by event types (contact injury, falls, fire and explosion, harmful exposure, transportation, or violent acts), or industry types (agriculture, construction, government and public service, and transportation). The map site also has a link to a prevention resource page with a list of the resources that was compiled by the FACE staff.
- Staff gave a presentation at the quarterly meeting of Central Atlantic States Association of Food and Drug Officials. The title of the presentation was “Fatal Injuries among Food Service Workers”. The presentation included a brief introduction of the FACE program, a review of 2016 BLS worker fatality data and food service worker fatality cases, and a FACE case discussion (“Restaurant Co-owner Fatally Crushed by a Dumbwaiter Car”). Approximately 40 people including staff of the New York State Department of Agriculture and Markets, food inspectors from state and county health departments, and representatives of food service companies such as Sodexo attended the meeting.
- Staff did a presentation at the local American Society of Safety Professionals Eastern New York Chapter Meeting on January 21, 2019: “Worker fatalities associated with mobile hand-fed woodchippers”. Approximately 30 safety professionals and industrial hygienists attended the meeting. The presentation highlighted the NY FACE research on woodchipper-related worker fatalities and shared the findings with the meeting attendants.
- Staff worked with the NYSDOH Public Affairs Group to develop a response to a blogger who requested information on the NY FACE woodchipper research. The blogger, who writes for The Pump Handle (a public health blog), requested information to write an article on woodchipper hazards and the importance of effective engineering controls.
- Staff developed and submitted a worker fatality case story, “Truck Driver Run Over by Trash Compactor at a Landfill” to MI FACE. The NY FACE case story was based on the FACE investigation 02NY007. MI FACE coordinates with the National Truckers Association (NTA) to publish the case stories developed by the FACE states in NTA’s monthly newsletter column, “Safety Issues”. These case stories are also sent out via email by the NTA President to its 18,000 members nationwide.

## Discussion/Conclusions

NY FACE worked closely with partners and stakeholders in developing injury prevention products and making these products more relevant to the users. In addition to investigation reports, staff developed peer-reviewed journal article, fact sheets, training videos, newsletter articles, monthly worker fatality announcements, presentations, interactive worker fatality maps, posters, and presentations. The cooperation between NY FACE and the end users made the final injury product more likely to be used and adopted.

**AIM 4. Disseminate the injury prevention products statewide and promote adaptation and implementation through collaboration of partners.**

## Methodology

NY FACE developed a *Focused Relay Dissemination Model (FRDM)* to guide its product dissemination process. There were three parties in this dissemination model: an owner (of the product), an intermediate recipient and an end user. A product would not go from NY FACE, the owner, directly to unknown end users. Instead, each end user group would receive the product from an intermediate recipient who was known to both the owner and the end users. There could be multiple intermediate recipients who would distribute the product through their networks to end users. Besides injury prevention partner organizations, interested members of the public can also serve as intermediate recipient as well. For each product, NY FACE identified multiple dissemination media such as: mail, email, internet posting, Facebook and Twitter messages, presentations, trade show posters, and journal articles and selected the appropriate ones for dissemination.

## Results

- Staff emailed information about FACE program, an article titled “Hispanic/Latino Fatal Occupational Injury Rates” by BLS, and a list of 145 cases of Hispanic worker fatality reports to the Senior Director of Health Policy & Advocacy for Hispanic Health Network. Staff met the Director at the Upstate Latino Summit, who was planning for a panel discussion on Latino health disparity and would like to add discussions and information on occupational safety and health for Latino workers.
- Staff reviewed and updated the content of *Logging Safety: A Field Guide* which was originally developed by NY FACE in 2009 based on the version created by WV FACE. The booklet has been a public favorite since 2011 when it was first printed. Over 6,000 copies were disseminated during the current funding cycle. Our dissemination partners ranged from EHS consultants and trainers, risk management professionals, to organizations such as NYCAMH, New York State Corrections and Community Supervision, NYSDEC, and NYS Parks. The recipients included loggers, farmers, workers in highway maintenance, park service, utility, and landscaping and nursery industries, ski areas, and US Forest Service. Wild land firefighters, rural landowners, trade school students, snowmobile club members, and inmate workers also received the Guide.
- Staff reviewed the factsheet “Chainsaw Safety for Homeowners” and updated the content. The factsheet was developed in 2004. Staff updated injury statistics, researched, and provided modernized photos of safe chainsaw use and PPE. Updated references and additional links to relevant occupational safety and health industries. Approximately 3000 were disseminated between 2014 and 2019 in different outreach venues.
- Staff emailed the NY FACE fatality alert “Dumbwaiters Can Kill, Interlocks on Doors Prevent Tragedy” to Dr. Anderson, MD. Chief Medical Officer and State Occupational and Environmental Disease Epidemiologist of Wisconsin Division of Public Health. A 21-year-old college senior and a gymnast was killed while working in a restaurant in Wisconsin in December 2014. Her head was crushed by a dumbwaiter car. FACE staff held a conference call with Dr. Anderson and his staff who requested for training and educational materials on how to safely operate a dumbwaiter and prevent injuries.
- Staff provided two NY FACE reports to the Director of Standards and Statistics of NWRA. NWRA recently published “The Best Safety Practices for Material Recover Facilities, Landfills and Transfer Stations” to address industry wide safety hazards and prevention measures. The two FACE reports “Truck Driver Run Over by Trash Compactor at Municipal Landfill” and “Truck Driver Buried by Mulch at Town Solid Waste Site” identified a safety

hazard associated with walking floor, an automatic unloading device installed on many trailers. A common practice among truck drivers is sweeping the walking floor or covering it with a tarp during unloading/unloading. Truck drivers can suffer serious injury or death if they get out of the cab without alerting other mobile equipment operators in the area. Staff asked NWRA to share the information with the industry.

- Staff worked with NYSDEC in developing an email alert for the solid waste industry. Solid waste workers have high injury and fatality rates and NYSDEC regulates the industry. The email alert included five NY FACE reports and a worker safety training video addressing solid waste worker fatalities and prevention measures. The email was sent to approximately 1,900 waste transporters and 2,700 solid waste management facilities. The web traffic to the five FACE reports increased substantially following the NYSDEC alert.
- Staff sent the NY FACE investigation report “Flatbed Truck Starts on Its Own, Crushing Auto Body Shop Worker” to the Automotive Service Association, National Auto Body Council, Society of Collision Repair Specialists, Capital District Auto Body Association, Westchester-Putnam-Rockland Auto Body Association, and New York State Association of Service Stations and Repair Shops. NY FACE investigated the case and identified an improperly installed starter as the likely cause. Workers should always set the parking brakes and chock the wheels before working on or around a vehicle. Staff asked the trade associations to share the report with their members.
- Staff disseminated the FACE report “Two Construction Workers Fatally Crushed when Cement Formwork Collapsed (13NY080)” to New York City Department of Environmental Protection, American Concrete Institute, National Ready Mixed Concrete Association, Concrete Foundations Association, American Society of Civil Engineers, National Society of Professional Engineers, The General Contractors Association of New York, Heavy Construction Contractors Association, Precast Concrete Institute, and 300 members on the NY FACE mailing list.
- Staff attended ski lift maintenance trainings at Hunter Mountain and Bristol Mountain. The trainings were sponsored by the Ski Areas of New York (SANY). Over 100 lift maintenance mechanics and NYSDOL lift inspectors attended these training sessions. Staff discussed worker safety issues with the lift workers. Staff also disseminated FACE publications including Logging Safety and snowmaking training cards during the training.
- FACE staff worked with Outreach Education, the NYSDOH Bureau of Creative Marketing and Communication, and OpAD Media Solutions LLC and conducted two social media campaigns: “Ladder Safety” and “Workplace Injury Prevention”. The two campaigns were designed to coincide with the national campaign to prevent construction falls and guide viewers to NY FACE webpage and a ladder safety landing page. The target population for *Ladder Safety* campaign was both English and Spanish speaking men of 20 to 65 years of age in high-risk jobs. The target population for *Injury Prevention* campaign was 20 to 65 years old English-speaking men in high-risk jobs. The mediums were digital banner ads and Google search ads. By clicking the banner ads or the Google search ads, the viewers would be directed to the NY FACE webpage or the ladder safety landing page. A ladder safety landing page in Spanish was specifically created for this campaign. The two campaigns delivered approximately 7,000 visits to both NY FACE homepage and the ladder safety landing page including 1,900 visits to Spanish ladder safety landing page. The campaigns provided the following findings:

- Viewers who were exposed to a banner ad, spend the most time on the NY FACE site on their mobile phone and tablets (but not on their computers).
- Younger men are more likely to click on search ads for English campaign while both younger and older men drove similar search click-through rates for the Spanish campaign.
- OSHA key words drove the strongest click through rates. (Viewers who typed key words with “OSHA” were more likely to click the ads to visit the destination pages.)
- The CDC/NIOSH National Occupational Research Agenda (NORA) Services Sector Council is interested in conducting awareness raising/social media campaign highlighting the life of Justus Booze for Worker’s Memorial Day. Justus Booze was the 23 years old worker who was pulled into a woodchipper on his first day on the job. NY FACE investigated the tragedy that took Justus Booze’s life. Staff contacted the NORA coordinator and provided her with the FACE report and the information of the NY FACE woodchipper study.
  - Staff had a conference call with the attorney who represented woodchipper manufacturing industry world-wide in litigation. After reading the article “Occupational fatal injuries associated with mobile hand-fed woodchippers”, the attorney contacted NY FACE and wanted to discuss the wood chipper passive feed control device that was one of the key prevention measures proposed in the paper. The pros and cons of passive controls and the technical challenges of the electrical/digital feed control devices were discussed during the conference call. The attorney provided a report summarizing the results of an evaluation of a mechanical dead-man control developed by Bandit.

### **Discussion/Conclusion**

The NY FACE dissemination process was a dynamic and interactive process. NY FACE, serving as the hub of the dissemination network, interacted with each of the dissemination partners who had a vested interest in the product. Since this relationship was mutually beneficial, the intermediate recipients were more willing and eager to speed up the dissemination process so that their user population could receive the products sooner. Another added benefit was the collaboration among the intermediate recipients. NY FACE facilitated the interactions and collaborations among its dissemination partners. The intermediate recipients benefited not only through the linear interactions with NY FACE, but also through lateral interactions with other intermediate recipients. The benefits that each partner received in return reinforced and expanded the collaborations. The adoption and implementation of safety practices is key for the success of any injury prevention program. NY FACE worked closely with partners to promote the use of training manuals and implementation of the standard safety operating procedures.

### **AIM 5. Assess the impact of NY FACE program and evaluate the effectiveness of injury prevention products.**

#### **Methodology**

The ultimate goal of fatal injury prevention is to completely eliminate work-related deaths. To ensure accountability and program effectiveness, NY FACE defined long-term public health outcomes as well as measurable program and short-term and intermediate public health outcomes. NY FACE were to conduct outcome-based evaluations to assess whether the program had achieved these desired outcomes. The long-term public health outcomes were defined as

reduced non-fatal and fatal injury rates among the working populations in NYS. In order to achieve the long-term goal, it was critical to have well defined measurable program outcomes and short-term and intermediate public health outcomes. NY FACE defined the following outcomes for measuring program success: improved quality of surveillance, increased number of products, increased injury prevention knowledge, increased utility of existing products, reduced program costs, and increased efficiency. The measurable short-term and intermediate public health outcomes included increased awareness of hazards among stakeholders and the public, increased injury prevention partners, behavioral changes among target populations, and increased adoption of recommendations.

## Results

- Following the publication of the NY FACE’s research article, the Pump Handle, a public health blog posted an article written by Dr. Celeste Monforton (<http://www.thepumphandle.org/2018/10/31/wood-chippers-worker-deaths-failing-to-adopt-safer-technology/#.W-B32HmWxaQ>). The article “Woodchippers, worker deaths, failing to adopt safer technology” highlighted the NY FACE research: “Thumbs up to” NY FACE “for their analysis of woodchipper fatalities. They get a big high five for amplifying the important message that engineering controls—such as sensing devices that can shut down the feed wheels on a woodchipper—are the most effective way to save workers’ lives.”
- A survey questionnaire was developed to collect viewers’ feedback on the two FACE videos. The questionnaire was posted on Youtube. Thirteen completed the survey by the end of February. The response was overall very positive with 77% rated the video quality as good or excellent. Viewers pointed out that the prevention message should emphasize employer’s responsibility and suggested improvement of certain digital techniques. The following are some of the comments from the viewers:
  - I loved the way the video was organized-it was brief, yet informative and presented in a way to actually share with our employees.
  - The video clips were well done, nicely chosen shots to illustrate the narration/voice over.
  - Great sequencing and effects of images. Tells story nicely. Especially like the “remember” segment. Done with taste, seriousness, and imagery helps solidify information.
  - Thank you for doing this. It is greatly appreciated, and I hope to see more of them in the future!
  - Great and to the point.
  - More videos please!
- One viewer completed an online survey for the FACE report “Two Construction Workers Fatally Crushed when Cement Formwork Collapsed”. The viewer was a human resource staff and a safety committee member working for a company in recreational business. The viewer rated the report as objective (excellent), clearly written (excellent), and useful (very good). The viewer rated the recommendations as clearly written (excellent), practical (very good), and useful (very good). The viewer commented that although the report had little direct application to his/her company, it validates the need for employers to keep competent persons at work sites, and to follow safety plans. The viewer planned to use the report in worker training and safety meetings and distribute it to company owners, managers, and workers.

- Staff sent the video “Driver Buried in Smoldering Mulch” and the NY FACE report “06NY084 Truck Driver Buried by Mulch at Town Solid Waste Site” to Ms. Laura Crocker, Media Director of Keith Manufacturing Company in Madras, Oregon. Keith manufactures walking floors, an unloading device that is widely used by solid waste and recycling companies. Ms. Crocker considered that the video was very well done. She shared it with her network of dealers and customers.
- Hunter College incorporated two NY FACE reports into an 8-hour Hazardous Waste Operation and Emergency Response annual review and refresher training package. The case information was included in the confined space safety module of the package. The training was provided to approximately 350 NYSDEC field employees statewide.
- Staff provided a list of 85 utility worker fatality cases investigated by the FACE program to Mr. Bill Martin, the electrical safety instructor and Susan Danskin, Business Development Manager of Northline Utilities. Mr. Martin stated that he would use the fatality cases for upcoming lineman training. Ms. Danskin forwarded the list to all managers companywide and encouraged them to use the information. Northline Utilities is in electrical and utility business headquartered in Au Sable Forks with approximately 100 employees.
- A senior safety consultant presented at ASSP Eastern New York Chapter Meeting on the topic of woodchipper safety and worker protection measures. Two NY FACE reports were featured in his presentation: “A 23-Year-Old Worker Pulled into a Woodchipper on His First Day on the Job” (16NY024) and “Guatemalan Tree-Service Worker Killed when Pulled into Brush Chipper” (05NY034). His presentation also highlighted the NY FACE woodchipper study and its findings.
- Senior Advisor for Safety, compliance & Standards of TCIA stated that TCIA could make great use of the NY FACE research findings after receiving the article “Occupational fatal injuries associated with mobile hand-fed woodchippers”. The Advisor planned shared the information with a very active tree work safety discussion group on Face Book.
- The Director of Health and Safety for NYSDEC contacted NY FACE to request a copy of the woodchipper paper and information on chipper feed control devices. Woodchippers are used by DEC employees. The Director considered that the paper raised a very important worker safety issue. He intended to inquire with vendors/manufacturers about better and safer feed control features, so that workers can be provided with better engineering controls.
- The owner of a tree service business in CA commented about the woodchipper research paper: “I read your report on woodchipper and tree safety. I believe you are spot on in your findings. I have petitioned California OSHA for stronger regulations on woodchipper safety. The petition was started in August of 2015. I specifically targeted passive safety to provide the woodchipper operator with the safety they need. Petition 549 was unanimously passed by the OSHA board in Jan of 2016. Cal OSHA is forming an advisory committee than is to convene the 3rd week of Jan 2019 in Sacramento California. Your report is very much appreciated as it can be used in the upcoming advisory committee meeting.
- The woodchipper worker fatality research project was selected as the annual “success story” for the NYSDOH Preventive Health and Health Services Block Grant.
- The owner of a power equipment sales and repair store in Arkport, NY contacted NY FACE to request for Logging Field Guide. The owner first obtained 10 copies of the Field Guide a few years ago while attending the NYS Farm Show. He made them available to his customers in his outdoor power equipment shop in the chainsaw area for customers who are interested in chainsaw cutting techniques and safety. He considered the Field Guide one of

the better ones that he had ever seen. He requested for 40 copies to be placed with his chainsaw display. He added the NY FACE website link on his social media pages.

### **Discussion/conclusion**

NY FACE clearly defined measurable outcomes and standards to evaluate the effectiveness of the program and the injury prevention products we developed. The results showed the impacts of our injury prevention efforts. With broad public support, a well-established surveillance system, and a dedicated, experienced, and innovative staff, NY FACE will continue the task of preventing workplace fatal injuries to bring every New Yorker home safely to their loved ones.

### **Injury Prevention Products Developed by NY FACE**

#### FACE reports

- “Flatbed Truck Starts on Its Own Crushing Auto Body Shop Worker” posted in March 2016. Available at <https://www.health.ny.gov/environmental/investigations/face/>.
- “Two Construction Workers Fatally Crushed when Cement Formwork Collapsed” available at <https://www.health.ny.gov/environmental/investigations/face/docs/13ny080.pdf>.
- “Mechanic Electrocuted when a Mobile Light Tower Contacted Powerline” available at <https://www.health.ny.gov/environmental/investigations/face/docs/12ny018.pdf>.
- “Trailer Tipper Operator Fatally Struck by a Tractor Trailer at a Landfill” available at <https://www.health.ny.gov/environmental/investigations/face/16ny009.htm>.
- “A 23-Year-old Worker Pulled into a Woodchipper on His First Day on the Job”. Available at <https://www.health.ny.gov/environmental/investigations/face/docs/16ny024.pdf>
- “Equipment Operator Fatally Crushed by the Bucket of a Front-End Loader at a Scrap Yard” (18NY019) available at <https://www.health.ny.gov/environmental/investigations/face/docs/18ny019.pdf>.
- “Truck Driver Fatally Struck When Fencing Materials Fell from Flatbed Trailer During Unloading” (Case #: 17NY014) available at <https://www.health.ny.gov/environmental/investigations/face/docs/17ny014.pdf>.
- “Town sanitation worker fatally crushed while riding on the riding step of a refuse collection truck” (Case #: 18NY063) available at <https://www.health.ny.gov/environmental/investigations/face/docs/18ny063.pdf>.
- “Machine Operator Fatally Struck by safety block ejected from mechanical power press” (Case # 16NY064) available at <https://www.health.ny.gov/environmental/investigations/face/docs/16ny064.pdf>.

#### Peer reviewed article

Zhu J, Gelberg K. “Occupational fatal injuries associated with mobile hand-fed wood chippers”. Am J Ind Med. 2018 Dec;61(12):978-985. doi: 10.1002/ajim.22913. Epub 2018 Oct 16.

#### Trade magazine articles

- Zhu J. “A Ladder Can Cause Serious Injuries and Deaths – a free ladder safety app can help you prevent injuries. Talk of the Town, June 2016.
- Worker fatality case story “Truck Driver Buried by Mulch at Town Compost Site” for the National Truckers Association’s monthly column “Safety Issues”.
- Worker fatality case story “Truck Driver Run Over by Trash Compactor at a Landfill” for the National Truckers Association’s monthly column “Safety Issues”.

### Other FACE publications

- FACE Fact Sheet: Dumbwaiters Can Kill, Interlocks on Doors Prevent Tragedy. Posted in July 2015. Available at <https://www.health.ny.gov/environmental/investigations/face/>.
- N FACE website: <https://www.health.ny.gov/environmental/investigations/face/index.htm>.
- NY FACE program brochure: <https://www.health.ny.gov/publications/6596.pdf>.
- “Interactive worker fatality maps (2013-2016)” available at [https://apps.health.ny.gov/statistics/environmental/public\\_health\\_tracking/tracker/index.html#/ohiWorkerFatalities](https://apps.health.ny.gov/statistics/environmental/public_health_tracking/tracker/index.html#/ohiWorkerFatalities)
- “Roofing Work Can be Deadly-Always use a personal fall arrest system”. Available at <https://www.health.ny.gov/publications/6022.pdf>.
- “Chainsaw Safety for Homeowners” available at <https://www.health.ny.gov/publications/3233#:~:text=Keep%20both%20hands%20on%20the,footing%20secure%20at%20all%20times.&text=Clear%20the%20area%20of%20loose,from%20falling%20or%20moving%20branches.&text=Avoid%20cutting%20overhead.&text=Stay%20clear%20of%20electrical%20power%20lines>.

### Youtube videos

- “Plumber Killed Catastrophic Trench Collapse”, worker safety training video available at [https://www.youtube.com/watch?v=Nhgee\\_Dsq-4&feature=emb\\_logo](https://www.youtube.com/watch?v=Nhgee_Dsq-4&feature=emb_logo).
- Truck Driver Buried in Smoldering Moldering Mulch”, worker safety training video available at [https://www.youtube.com/watch?v=b7zh0j6twg8&feature=emb\\_logo](https://www.youtube.com/watch?v=b7zh0j6twg8&feature=emb_logo)

### Presentations

- Zhu J. Prevent Worker Fatalities through Conducting FACE Program. Presented at Eastern New York Chapter of the American Society of Safety Engineers Technical meeting, Latham, NY, March 14, 2016.
- Gibson A. Confined Space Hazard Webinar. Presented for state field technicians and sanitarians. Albany, NY, October 19, 2016.
- Gavaghan S. NY FACE Program and Investigations. Presented at NYS Department of Health Center for Environmental Health Director Rounds. Albany, NY, January 9, 2018.
- Zhu J. Fatal Injuries among Food Service Workers. Presented at the quarterly meeting of Central Atlantic States Association of Food and Drug Officials (CASA). Latham, NY, February 9, 2018.
- Zhu J. Worker fatalities associated with mobile hand-fed wood chippers. Presented at American Society of Safety Professionals (ASSP) Eastern New York Chapter Meeting. Latham, NY, January 21, 2019
- Gibson AM. Confined Spaces. Presented at webinar for the Winter 2019 Basic Environmental Health Program. East Greenbush, NY, March 25, 2019
- Zhu J. Worker Deaths Associated with Mobile Wood Chippers. Presented at the Director’s Round. Albany, NY, October 8, 2019.
- Zhu J. Wood Chipper Related Worker Fatality Research. Presented at Safety in the Hilltowns. Rensselaerville, NY, February 21, 2020
- Klein A. Garbage Truck-related Worker Fatality Research. Presented at Safety in the Hilltowns. Rensselaerville, NY, February 21, 2020

### Posters

- NY FACE Program Highlights (2015-2016). Presented at FACE Annual Meeting. Morgantown, WV, September 19-20, 2016.
  - Analysis of Workplace Violence Regulatory Activity in the United States & Specific Case Study. Presented at SUNY School of Public Health, April 2019.
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