

## **Title Page**

### **Principal Investigator:**

Kitty H. Gelberg, Ph.D., MPH  
New York State Department of Health  
Bureau of Occupational Health & Injury Prevention

Empire State Plaza  
Corning Tower, Room 1325  
Albany, NY 12237  
518-402-7900  
[Kitty.gelberg@health.ny.gov](mailto:Kitty.gelberg@health.ny.gov)

### **Award:**

Health Research Inc / NYS Department of Health  
Riverview Center  
150 Broadway, Suite 560  
Menands, NY 12204-2719

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

### **Co-Investigators:**

### **Project Director and Sponsors:**

Karen Cummings, MPH  
Julia Zhu

**Grant Number:** 2U600H008474

**Project Period:** 07/01/2010 – 06/30/2015

**Date Final Report Submitted:** September 30, 2015

## Table of Contents

Title Page.....	1
List of Terms and Abbreviations.....	6
Abstract - Overall .....	7
Overall Program .....	8
Significant Findings .....	8
Translation of Findings.....	8
Intermediate Outcomes .....	9
Final Scientific Report – Overall Program.....	10
Background.....	10
Specific Aims .....	12
Aim 1.....	12
Methodology .....	13
Results.....	14
Discussion and Conclusions.....	14
Aim 2.....	14
Methodology .....	14
Results.....	15
Discussion/Conclusions.....	17
Aim 3.....	17
Methodology .....	18
Results.....	18
Discussion/Conclusions.....	19
Aim 4.....	19
Methodology .....	19
Results.....	20
Discussion/Conclusions.....	21
Aim 5.....	21
Methodology .....	21
Results.....	21
Discussion/Conclusions.....	22
Occupational Injury Prevention Products Developed .....	22
Abstract – New York FACE .....	25
New York FACE.....	27

Significant Findings .....	27
Translation of Findings:.....	27
Outcomes/Impact: .....	28
Final Scientific Report – New York FACE.....	29
Background: .....	29
Specific Aims .....	30
Aim 1.....	30
Methodology .....	30
Results.....	30
Discussion/Conclusions:.....	31
Aim 2.....	31
Methodology .....	31
Results.....	32
Discussion/Conclusions .....	34
Aim 3.....	34
Methodology .....	34
Results.....	35
Discussion/Conclusions .....	36
Aim 4.....	36
Methodology .....	36
Results.....	36
Discussion/Conclusions .....	39
Aim 5.....	39
Methodology .....	39
Results.....	40
Discussion/Conclusions .....	45
Occupational Injury Prevention Products Developed by NY FACE .....	46
Cumulative Inclusion Enrollment Report .....	49
Abstract – New York Pesticide Poisoning Program.....	50
New York Pesticide Poisoning Program .....	52
Significant Findings .....	52
Translation of Findings .....	52
Intermediate Outcomes:.....	53
Final Scientific Report – Pesticide Poisoning Program .....	54

Background.....	54
Specific Aims .....	55
Aim 1.....	55
Methodology .....	55
Results.....	56
Discussion/Conclusions.....	56
Aim 2.....	56
Methodology .....	56
Results.....	57
Discussion/Conclusions.....	57
Aim 3.....	57
Methodology .....	57
Results.....	57
Discussion/Conclusions.....	59
Aim 4.....	59
Methodology .....	59
Results.....	59
Discussion/Conclusions.....	60
Aim 5.....	60
Methodology .....	60
Results.....	60
Discussion/Conclusions.....	61
Occupational Injury Prevention Products Developed by NYS Pesticide Poisoning Prevention Program.....	61
Cumulative Inclusion Enrollment Report .....	63
Abstract – New York Work-Related Asthma Program .....	64
New York Work-related Asthma (WRA) Program.....	66
Significant Findings .....	66
Translation of Findings.....	66
Intermediate Outcomes:.....	67
Final Scientific Report – Work-Related Asthma Program.....	68
Background.....	68
Specific Aims .....	69
Aim 1.....	69

Methodology .....	69
Results.....	70
Discussion/Conclusions .....	71
Aim 2.....	72
Methodology .....	72
Results/Accomplishments .....	73
Discussion/Conclusions .....	76
Aim 3. ....	76
Methodology .....	76
Results.....	77
Discussion/Conclusions .....	78
Aim 4.....	79
Methodology .....	79
Results.....	79
Discussion/Conclusions .....	80
Aim 5.....	80
Methodology .....	80
Results.....	80
Discussion/Conclusions .....	81
Aim 6.....	81
Methodology .....	81
Results.....	81
Discussion/Conclusion:.....	82
Aim 7.....	83
Results.....	83
Occupational Injury Prevention Products Developed by NYS WRA Program.....	83
Cumulative Inclusion Enrollment Report .....	85
References .....	<b>Error! Bookmark not defined.</b>

## List of Terms and Abbreviations

ACBS - Asthma Call-back Survey  
ANSI - American National Standards Institute  
BLS – Bureau of Labor Statistics  
BOHIP - Bureau of Occupational Health and Injury Prevention  
BRFSS – Behavioral Risk Factor Surveillance System  
CFOI – Census of Fatal Occupational Injuries  
CME – Continuing Medical Education  
CODES – Crash Outcome Data Evaluation System  
DEC - Department of Environmental Conservation  
DOH – Department of Health  
ED – Emergency Department  
EPA – Environmental Protection Agency  
FACE – Fatality Assessment and Control Evaluation  
FIFRA – Federal Insecticide, Fungicide and Rodenticide Act  
GOL – Game of Logging  
HMR – Heavy Metals Registry  
IH – Industrial Hygiene  
MOU – Memorandum of Understanding  
NEC - Northeast Center for Occupational Health and Safety  
NIOSH – National Institute for Occupational Safety and Health  
NPDS - National Poisoning Data System  
NSSA – National Ski Area Association  
NYC – New York City  
NYCAMH – New York Center for Agricultural Medicine and Health  
NYS – New York State  
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  
PPE – Personal Protective Equipment  
PPR – Pesticide Poisoning Registry  
PSAA – Pennsylvania Ski Area Association  
RC&D - Resource Conservation and Development  
SANY – Ski Areas of New York  
SPARCS - Statewide Planning and Research Cooperative System  
SPIDER - SENSOR Pesticide Incident Data Entry and Reporting  
WC – Workers Compensation  
WCB – Workers Compensation Board  
WRA – Work-related Asthma

## **Abstract - Overall**

New York State (NYS) is the fourth most populous state, with over 19 million persons residing on over 47,000 square miles of land. With almost nine million full-time employees in 2012, NYS is also home to a varied workforce. Because NYS is so large and diverse, there is a wide spectrum of occupational fatalities, injuries and diseases that occur among the population. 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 as described below.

NYSDOH has effectively collected and publicized all occupational health indicators, and has 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 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 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.

Information from the OHIs was used to influence the 2013-2017 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.

## Overall Program

### 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 have created an opportunity for communication with the NYS Workers Compensation Board, allowing for a sharing of data with the NYS Department of Health, and a discussion of prevention efforts occurring within each agency. These data have been posted in multiple locations on the NYS Department of Health web site, increasing awareness of occupational health issues through other programs.

- 2) Stakeholders have been instrumental in raising awareness of and disseminating worker health and safety information.

Partnerships have enable 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. Disparate populations including workers of low income, undocumented workers, non-English speakers, and minority have been reached. The effects of occupational exposures being brought home to the family have also influenced programs working with infants and teens, besides exposed workers.

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

Extensive work has been conducted regarding raising awareness of occupational exposures among workers, and how these exposures can translate into the home environment. Focus groups conducted with workers identified their concerns and confirmed that NYS DOH prevention messages were appropriate and easy to understand. Oversight of the NYS Occupational Health Clinic Network 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.

- 4) Outreach and intervention efforts directed to high-risk and vulnerable populations requires the use of partnerships to gain trust and entrance into facilities.

The NYS Department of Health has worked collaboratively with the Departments of State and Labor to develop and implement regulations to protect nail salon workers throughout NYS. A combination of enforcement and education was utilized to ensure the workers maintained their jobs in a safe environment with appropriate pay.

### 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.

### Intermediate Outcomes

- Occupational Health Indicators were provided to the Council of State and Territorial Epidemiologists and NIOSH.
  - A subset have been calculated at the county level and have been shared with other DOH programs for posting on their web pages.
  - Multi-year summary reports examining the profile of workers in NYS since 2000, and blood lead levels among adults have been posted on the NYSDOH website.
  - Racial and ethnic differences were analyzed within the adult blood lead indicator and incorporated into the NYS Minority Health report.
- Occupational health data describing lead, mercury, arsenic and cadmium exposure, young workers treated in emergency departments, and patients seen by the NYS Occupational Health Clinic have been shared through publications and the NYSDOH website.
- Occupational health data were used to help develop the NYS Prevention Agenda, Healthy Environment Workplace Injury Objectives. These were included as part of the State Health Improvement Plan which was used to assist NYSDOH in obtaining public health accreditation.
- Eleven occupational health clinics, including a specialty clinic for agricultural health, were awarded contracts that distributed over nine million dollars annually for five years throughout NYS to aid in the recognition, diagnosis, treatment and prevention of occupational diseases. Over 7,600 patients were seen in over 11,800 visits.
- A Worker's Bill of Rights, along with fact sheets and presentations were developed for workers and owners of nail salons in NYS as part of the NYS Nail Salon Industry Enforcement Task Force.
  - Partnering with the Departments of State and Labor and the Governor's office, regulations were developed and implemented to protect nail salon workers in NYS.
- Access was gained to new databases including the Workers Compensation Board, Poison Control Centers, and Trauma Registries, allowing for further description of the burden of occupational injuries and diseases in NYS.
- The *Lead on the Job* brochure for workers was rewritten based on input from workers, and has been translated into Spanish.
- An education conference for health care providers about recognizing and diagnosing occupational disease was created. CME and CNE credits were provided.

## Final Scientific Report – Overall Program

### Background

Occupational illnesses and injuries encompass a wide variety of diverse health conditions including cancers, musculoskeletal disorders, respiratory impairment, and poisonings. Over 215,000 injuries and illnesses in NYS were reported to the United States (US) Department of Labor, Bureau of Labor Statistics (BLS) in workplaces during 2012, of which 121,000 required days away from work.<sup>1</sup> In 2004, it was estimated that at least 24 percent of all injuries were missed by this survey due to the exclusion of public workers and self-employed. In addition, it is further estimated that the annual survey missed between 33 percent to 69 percent of all injuries due simply to underreporting.<sup>2,3</sup> While there is ongoing work to improve these estimates, including the inclusion of public workers, no studies demonstrating the effectiveness of this work have yet to be completed. Nevertheless, the BLS annual survey is currently the best method to assess the incidence of work-related injuries in the US. It is estimated that occupational injuries cost roughly 170 billion dollars per year (1992 dollars) based on the underestimate of the incidence of injuries.<sup>4</sup>

Surveillance is a necessary component to guide action in preventing workplace injuries and illnesses. 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. As stated in the NIOSH strategic goals, state-based surveillance systems provide a vital foundation for federal surveillance systems and assist in augmenting those systems.<sup>5</sup>

Occupational health surveillance is hampered by problems with disease recognition and reporting.<sup>3,6</sup> In order to appropriately diagnose a work-related illness, the relationship to work has to 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>7</sup>

NYS had over 8,900,000 full-time employees in 2012. According to the BLS, over 215,000 of these workers suffered from work-related injuries or illnesses with approximately 111,500 involving days away from work. In NYS, 206 workers died of traumatic injuries on the job in 2011. 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>1</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 OHIs<sup>8</sup> including the BLS industry surveys and the Census of Fatal Occupational Injuries (CFOI), hospitalization and emergency department (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. Outlined below is a summary of the demographics of NYS workers, identifying pertinent occupational health and safety information.

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>1</sup>

NYSDOH recognizes that occupational health is an important component of overall public health. The Bureau of Occupational Health and Injury Prevention (BOHIP) has over 30 years of experience in occupational health surveillance, research and intervention. BOHIP will be responsible for implementing this proposed occupational health surveillance project following the guidelines for comprehensive state-based occupational health activities.<sup>9</sup> BOHIP has a long history and a strong on-going investment in the use of surveillance data in support of occupational health epidemiology in the public health arena. For example, the Heavy Metals Registry was established in 1980 (perhaps the first in the nation) and occupational lead poisoning data from this registry were reported to 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 (IH), data analysis, computer programming and health education. It is necessary for all systems to interact with each other in order to ensure that identified cases receive appropriate follow-up.

NYSDOH oversees three occupational disease registries – the Heavy Metals Registry, the Pesticide Poisoning Registry and the Occupational Lung Disease Registry – 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.

Attaining complete, sustained, and timely reporting to our registries from sources remains a challenge. BOHIP developed and evaluated a model for states to use to improve reporting to their physician-based occupational disease surveillance systems. A primary goal of our activities was to identify barriers to the reporting of cases to the registries and to develop a comprehensive set of strategies for addressing these barriers. Physicians' lack of awareness regarding reporting requirements, and their concerns about patient confidentiality and embarrassment, the time and effort involved in reporting and the usefulness of disease reporting, were continually cited as the primary reason for the underreporting of conditions.<sup>6,7,10,11</sup> These reasons also influence physicians' reporting of occupational conditions, but additional factors influence whether an occurrence of occupational disease is captured by a surveillance system. For example, it has been noted that the identification of an occupational condition is dependent on a medical care providers' ability to recognize a condition as being work-related.<sup>6</sup> Another study found that physicians were hesitant to diagnose and report occupational conditions out of concern that doing so might hinder industry.<sup>12</sup>

In order to combat these barriers, we apply several general strategies across our outreach efforts. These strategies included pilot-testing materials and distribution channels, establishing partnerships and emphasizing evaluation. We utilize focus groups to test our messages and materials to better ensure that our target audiences will accept our materials and respond to them appropriately. We choose to establish partnerships with organizations and institutions to distribute our messages and materials which increases our target audiences' acceptance of our messages and extends the reach of our outreach, and also sustains the transmission of our messages and materials after the completion of a funding program. Finally, emphasizing evaluation provides us with better assurance of whether our various activities were successful and offers concrete feedback about the impact of activities.<sup>13</sup>

NYSDOH oversees the nation's only state-based occupational health clinic network. The network includes ten regionally based Clinics along with an agricultural medicine clinic. 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 IH evaluation of workplaces of concern; and provide education and prevention programs.

### Specific Aims

**Aim 1.** To collect, analyze, disseminate and evaluate the 19 Occupational Health Indicators (OHIs) developed by the Council of State and Territorial Epidemiologists and NIOSH.

### *Methodology*

Since the beginning of this grant time period, the number of nationwide indicators has increased to 22, including new indicators for work-related low back disorders, work-related asthma, and work-related severe traumatic injuries. NYSDOH was the lead in the development of the work-related asthma indicator, and assisted in the pilot testing of the other two indicators.

Partnerships have been maintained with all necessary partners in order to allow for collection of each of the OHIs. An agreement was reached with the NYS Workers Compensation Board in 2005 allowing for their data to be shared. Hospital discharge data is received monthly and Cancer Registry data are received annually from other bureaus within NYSDOH. The adult blood lead data is generated within BOHIP. NIOSH provides the Poison Control Center data required for calculation of pesticide poisonings annually. Other data sources, including Census and Bureau of Labor Statistics, are available on-line.

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. Additionally, NYSDOH wrote the how-to guidance for the collection of the work-related asthma indicator that was included in the March 2014 update of the "Occupational Health Indicators: A Guide for Tracking Occupational Health Conditions and Their Determinants", and provides technical assistance for this indicator.

Five of the OHIs - pneumoconiosis hospitalizations, asbestosis hospitalizations, work-related hospitalizations, malignant mesothelioma, and elevated blood lead levels ( $\geq 10$  mcg/dL) among adults - have been calculated at the county level in New York State. Staff is working to incorporate information from six occupational health indicators into the Environmental Public Health tracking program at the state level for the years 2000 through 2010. County-level data and maps will be added for elevated blood lead levels, both  $\geq 10$  mcg/dL and  $\geq 25$  mcg/dL, work-related hospitalizations, pneumoconiosis hospitalizations, asbestosis hospitalizations, fatal occupational injuries, and mesothelioma. All state-wide indicators available for these years will be included in the portal. Data will be updated on an annual basis.

Staff is working on a multi-year summary of the OHIs including trend analyses, and analyses by race, ethnicity and sex. Some indicators are being further examined by geography, race and age. Additional indicators specific to NYS are also being created and analyzed.

### *Results*

- A Memorandum of Understanding (MOU) with the NYS Workers Compensation Board has been signed allowing NYSDOH to gain access to Workers Compensation data for use in identifying the burden of occupational injuries and diseases.
- Staff participate on the OHI Sub-State Level Data Analysis workgroup providing advice and input into the development of a how-to guide for sub-state level indicators.
- Five of the OHIs have been calculated at the county level in New York State and provided to the Community Health Indicator Reports to improve community access to occupational health data in a user-friendly environment. These include calculating and mapping rates for three years for all pneumoconiosis hospitalizations, asbestosis hospitalizations, work-related hospitalizations, malignant mesothelioma, and elevated blood lead levels ( $\geq 10$  mcg/dL) among adults.
- The three-year rate for each county was compared to the NYS rate for the five OHIs along with the incidence of malignant mesothelioma, elevated blood lead levels for both  $\geq 10$  mcg/dL and  $\geq 25$  mcg/dL, and fatal work-related injuries.
- The NYSDOH Occupational Health Indicators webpage was updated to allow for better display of state and county-level 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 first two multi-year summary reports examining the profile of workers in NYS since 2000, and blood lead levels among adults are posted on the NYSDOH OHI webpage.

### *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 utilize stakeholders to raise awareness of worker health and safety in NYS, to incorporate occupational health into public health activities, 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 is routinely disseminated through the Injury Prevention listserv, and through the NYSDOH webpages. BOHIP staff participates on various task forces and workgroups to ensure occupational health issues are appropriately addressed.

## Results

- As previously mentioned, staff is working to incorporate information from six occupational health indicators into the Environmental Public Health tracking program at the state level for the years 2000 through 2010. County-level data and maps will be added for elevated blood lead levels, both  $\geq 10$  mcg/dL and  $\geq 25$  mcg/dL, work-related hospitalizations, pneumoconiosis hospitalizations, asbestosis hospitalizations, fatal occupational injuries, and mesothelioma. All state-wide indicators available for these years will be included in the portal. Data will be updated on an annual basis.
- 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:
  - Increase the number of NYSDOH databases computerizing industry and occupation variables from 3 to 15.
  - Reduce the impact of climate change on outdoor workers.
  - Reduce the rate of occupational injuries treated in EDs among working adolescents 16-19 years of age from 1.5 per 100 full-time equivalent workers to 1.35.
  - Reduce the rate of emergency room visits for occupational injuries among adolescents 15-19 years of age from 36.7 to 33.0 per 10,000 workers.
  - Increase the percent of hospitals with comprehensive respiratory protection policies from 39.1 percent to 54.7 percent.
  - Increase the percent of health care workers vaccinated for the flu from 75.6 percent to 90.0 percent.
  - Increase the percent of workers who come in contact with the public who are vaccinated for the flu.

These have been updated for the State Health Improvement Plan which was used to assist NYSDOH in obtaining public health accreditation.

- 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 displaying both the number and rate of occupational injuries treated in an ED per 10,000 adolescents, aged 15-19 years old, by county, in comparison to the prevention agenda goal. New York State is significantly improved for this goal  
[https://apps.health.ny.gov/doh2/applinks/ebi/SASStoredProcess/guest? program=/EBI/PHIG/apps/dashboard/pa\\_dashboard](https://apps.health.ny.gov/doh2/applinks/ebi/SASStoredProcess/guest? program=/EBI/PHIG/apps/dashboard/pa_dashboard).
- Staff has integrated information from the adult blood lead indicator into the NYS Minority Health report. The report was generated to document racial and ethnic differences in health status and health care access and quality  
[http://www.health.ny.gov/statistics/community/minority/docs/surveillance\\_report\\_2012.pdf](http://www.health.ny.gov/statistics/community/minority/docs/surveillance_report_2012.pdf).

- An analysis of blood mercury data reported from 2001 to 2008 was completed and published.
- A new Request for Applications was posted for the New York State Occupational Clinic Network. Eleven contracts were awarded that distributed over nine million dollars annually for five years throughout New York State to aid in the recognition, diagnosis, treatment and prevention of occupational diseases.
- An update of the Occupational Health Clinic Network report was completed to include data from 2004 through 2010  
[http://www.health.ny.gov/environmental/workplace/occupational\\_health\\_clinic/clinic\\_report/clinic\\_report\\_2004-2012.htm](http://www.health.ny.gov/environmental/workplace/occupational_health_clinic/clinic_report/clinic_report_2004-2012.htm).
- A summary of data from the Heavy Metals Registry 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 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/).
- BOHIP staff provided information about worker exposures for a Health Impact Statement regarding hydrofracking in NYS developed by NYSDOH  
[http://www.health.ny.gov/press/reports/docs/high\\_volume\\_hydraulic\\_fracturing.pdf](http://www.health.ny.gov/press/reports/docs/high_volume_hydraulic_fracturing.pdf).
- Staff participated in the NYS Nail Salon Industry Enforcement Task Force along with the Department of State, Department of Labor and Governor Cuomo's office in developing and implementing regulations to protect nail salon workers throughout New York State. This also involved creating a Worker's Bill of Rights, and fact sheets and presentations for workers and owners <http://www.ny.gov/programs/nail-salon-safety-what-you-need-know>.
- Staff participated in the Safe Patient Handling workgroup. This workgroup was established as part of the New York State's Safe Patient Handling Law for the purpose of identifying best practices, sample policies and other resources, to assist health care facilities in implementing the law.
- BOHIP continues to collaborate with the NYS Young Workers Safety and Health Project; a multi-state agency project devoted to educating teens on workplace safety and health issues.
- The Adult Blood Lead program has worked with the childhood lead program 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.
- Staff has participated in workgroups with the Governor's Traffic Safety Committee, the Traumatic Brain Injury Coordinating Council, Safe Schools Task Force, Healthy Homes program, Traffic Incident Management team, Suicide Prevention Council, and with climate change surveillance programs, exploring areas of collaboration and incorporation of occupational health and safety practices into other arenas.
- Staff worked with the University of Albany, School of Public Health, in participating on the dissertation committee for a doctoral student examining surveillance methodology for injuries in agriculture and forestry.

- BOHIP staff participated in NYSDOH-wide discussions about high risk populations for extreme heat issues associated with climate change.
- BOHIP staff introduced the NYS Department of Budget to occupational health issues through a tour of the local community describing worker health issues.
- Staff collaborated with the California Department of Health on an actor exposed to HIV on the set of a male adult entertainment company. The filming occurred in Nevada, but one of the potential companies was New York based. OSHA and the NYSDOH AIDS Institute participated in the contact investigation. No actors in NYS were found to be positive for HIV or sexually transmitted diseases.
- A referral from one of the state Occupational Health clinics resulted in the identification of dietary supplements contaminated with steroids resulting in severe adverse health effects among some of those exposed. The NYSDOH Wadsworth Laboratories were able to identify the presence of the steroid and shared their findings and methodology with the US Food and Drug Administration. Working with the CDC, a medical records review was conducted of a practitioner who prescribed this particular brand of supplements to his patients. The CDC operationalized their Emergency Operations Center to conduct interviews of the patients. The supplements were withdrawn from the market and the manufacturer and distributor both went out of business.

#### *Discussion/Conclusions*

Information from the OHIs was used to influence the 2013-2017 State Prevention Agenda – the blueprint for state and local action to improve the health of New Yorkers. A goal to reduce occupational injury and illness in NYS was developed, which included increasing the number of NYSDOH databases using computerized industry and occupation variables; reducing the impact of climate change on outdoor workers; reducing the rate of occupational injuries among working teens; increasing the percent of hospitals with comprehensive respiratory protection policies; increasing the percent of health care workers vaccinated for the flu; and increasing the percent of workers who come in contact with the public vaccinated for the flu.

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.

***Aim 3.*** 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 populations in both NYS and New York City.

### *Methodology*

Databases maintained by NYSDOH are available for analysis including hospital discharges, ED visits, outpatient clinic visits, occupational registries including the Pesticide Poisoning Registry, the Occupational Lung Disease Registry, 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 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.

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 New York State excluding the five boroughs of New York City) and New York City, 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.

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

### *Results*

- A Memorandum of Understanding (MOU) with the NYS Workers Compensation Board has been signed allowing NYSDOH to gain access to Workers Compensation data for use in identifying the burden of occupational injuries and diseases.
- A MOU with the National Poison Control System has been signed allowing NYSDOH to gain real-time access to this surveillance source that can be used to identify possible occupational cases. BOHIP is reviewing all symptomatic occupational cases as they are reported from either of the two Poison Control Centers in NYS.
- Staff completed analysis of an internal study comparing work-relatedness as identified from medical records to hospitalization data using proxy indicators of payment by Workers' Compensation for a subset of inpatient amputations, outpatient amputations, and outpatient carpal tunnel syndrome cases. Results showed that approximately 50 to 60 percent of work-related hospitalizations for amputations and carpal tunnel syndrome can be identified using proxy variables. There was no difference in ability to

identify work-relatedness based on the diagnosis, whether the case was inpatient or outpatient, nor whether the case was outpatient or seen in the Emergency Department.

- Staff gained access to the NYS Trauma Registry data. These data are being explored and a descriptive analysis of the work-related injuries have been conducted. Staff have worked with the managers of the database to ensure accurate and complete coding of occupation and industry for all workers in the database. Data is also being stratified by mechanism of injury.
- Questions were added to the NYS Behavioral Risk Factor Surveillance System (BRFSS) collecting information on industry and occupation in 2013, 2014, and 2015. Almost 2000 individuals provided responses to these questions. Data has been examined for 2013 but due to low numbers in each cell, staff are waiting for another year of data to analyze the results with other BRFSS questions.
- Staff is working on incorporating all blood lead levels, regardless of level, into the Heavy Metals Registry's electronic database for case matching. This will allow staff to see and evaluate an individual's full lead testing history. Cases are currently only case matched at 10 µg/dL or higher.
- A computer assisted telephone interview is being developed for identified high-risk individuals for lead poisoning from the Heavy Metals Registry. This interview will not only allow direct data entry of the interview responses which will allow for better data analysis of exposures, but will also have educational prompts based upon the responses to ensure proper education on reducing exposures is being provided.

#### *Discussion/Conclusions*

Memoranda of Understanding were created and signed allowing access to databases not previously used for occupational health surveillance in NYS including Workers' Compensation and Poison Control Center case reports. In addition, access was gained to the NYS Trauma Registry data with agreement from the data stewards to improve quality and completeness of the industry and occupation variables for all workers. This database will allow for exploration of all serious injuries among workers. Industry and occupation questions were also added to the BRFSS which will allow examination of occupation or industry as a risk for other health conditions. The lead component of the Heavy Metals Registry was improved to allow all lab tests on New York residents and employees to be incorporated, and to allow for better education of those with exposures.

**Aim 4.** To develop and disseminate materials that will increase awareness and prevention strategies of occupational diseases and injuries, among workers, employers and health care providers in NYS.

#### *Methodology*

BOHIP has worked to conduct outreach activities that address issue specific occupational injury and illness programs, along with raising general awareness of overall occupational health and safety. Outreach to the medical community has occurred along with reaching out to industry groups, unions and employers. Web pages have been reviewed and updated as necessary.

## Results

- 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.
- The adult blood lead program has worked with the childhood lead program in identifying pregnant women with elevated blood lead levels. 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 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 New York State laboratory directors for their reference in interpreting blood lead levels in adults. Wadsworth Laboratories oversees the Clinical Laboratory Evaluation Program.
- A Computer Assisted Telephone Interview (CATI) is being developed for all lead questionnaires. The CATI will allow for appropriate public health messages to appear on the screen depending on the responses to the questionnaire to ensure correct educational information regarding the reduction of lead exposure and appropriate personal protection is given to the individual, depending on the source of their lead exposure. The CATI will streamline staff time by eliminating data entry and minimizing data clean up, and will allow the lead questionnaire data to be uploaded daily into the Heavy Metals Registry database.
- Staff participated in the NYS Nail Salon Industry Enforcement Task Force along with the Department of State, Department of Labor and Governor Cuomo's office in developing and implement regulations to protect nail salon workers throughout New York State. This also involved creating a Worker's Bill of Rights, and fact sheets and presentations for workers and owners.
- Staff continue to oversee and support the eleven clinics in the New York State Occupational Health Clinic Network which aid in the recognition, diagnosis and treatment of occupational diseases. Over 7,600 patients were seen in more than 11,800 visits. Data from the Network is being analyzed to better identify disparities in relation to a patient's diagnosis, exposure, occupation and industry. New brochures advertising the clinic network have been published – *Protecting the Workers of New York State: For Workers, Retirees, and Residents*, and *Protecting the Workers of New York State: For Businesses*.
- Staff collaborated with the OEHC of Eastern NY and the University of Albany, School of Public Health to create an educational conference for health care providers about recognizing and diagnosing occupational disease. Continuing Medical Education (CME) and Continuing Nursing Education credits were available, and select populations were able to participate on-line.
- NYSDOH participated in Occupational Health Awareness and Education week - a weeklong event in NYS highlighting occupational health and safety issues, centered around Workers Memorial Day.

### *Discussion/Conclusions*

Extensive work has been conducted regarding raising awareness of lead poisoning among workers, and how these exposures can translate into the home environment. Focus groups conducted with workers exposed to lead identified their concerns and confirmed that NYS DOH prevention messages were appropriate and easy to understand.

Oversight of the NYS Occupational Health Clinic Network 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, starting with the Nail Salon Industry.

**Aim 5.** To focus intervention efforts and conduct outreach to high-risk and vulnerable populations including young workers, agricultural workers, and low-income, minority, immigrant and Hispanic working populations.

### *Methodology*

BOHIP worked with the Office of Minority Health to explore methods of reaching low-income, minority and immigrant workers to disseminate occupational health information to hard-to-reach groups.

### *Results*

- Staff has integrated information from the adult blood lead indicator into the NYS Minority Health report. The report was generated to document racial and ethnic differences in health status and health care access and quality.
- Staff participated in the NYS Nail Salon Industry Enforcement Task Force along with the Department of State, Department of Labor and Governor Cuomo's office in developing and implement regulations to protect nail salon workers throughout New York State. This also involved creating a Worker's Bill of Rights, and fact sheets and presentations for workers and owners.
- Staff collaborate with the NYS Young Workers Safety and Health Project; a multi-state agency project devoted to educating teens on workplace safety and health issues.
- Staff has participated in workgroups with the Traumatic Brain Injury Coordinating Council exploring areas of collaboration and incorporation of occupational health and safety practices into the prevention of Traumatic Brain Injuries.
- The brochures - *Lead on the Job, Is Your Asthma Work-related?* and *Protecting the Workers of New York State: For Workers, Retirees & Residents* have been translated into Spanish and printed.
- Staff is conducting 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.

### *Discussion/Conclusions*

Further work and effort needs to be directed in this area; however, limited success has been gained in outreach and intervention efforts directed to high-risk and vulnerable populations utilizing partnerships. These have helped create programs that protect workers while enforcing regulations that will continue to assist them to be paid appropriately. Staff continue to explore opportunities, primarily working with other NYSDOH programs that have more direct access to high-risk workers.

### Occupational Injury Prevention Products Developed

#### ***Presentations***

- “World Trade Center Responders Fatality Investigation Program.” NYC Mayor’s WTC Medical Working Group, August 2010, New York NY.
- “Fundamentals of Industrial Hygiene and Occupational Fatal Injury Prevention”. Environmental and Occupational Epidemiology Course at SUNY Albany School of Public Health, March 2011, Rensselaer NY.
- “Occupational Health Surveillance.” Environmental and Occupational Epidemiology Course at SUNY Albany School of Public Health, March 2011, Rensselaer NY.
- “Use of Proxy Variables to Identify Work-relatedness in Hospitalization Data.” CSTE Annual Meeting, June 2011, Pittsburgh PA.
- “Winnable Battles in Occupational Health.” CSTE Annual Meeting, June 2011, Pittsburgh PA.
- “World Trade Center Responders Fatality Investigation Program.” CSTE Annual Meeting, June 2011, Pittsburgh PA.
- “Fundamentals of Industrial Hygiene and Occupational Fatal Injury Prevention”. Environmental and Occupational Epidemiology Course at SUNY Albany School of Public Health, March 2012, Rensselaer NY.
- “Occupational Health Surveillance”. Environmental and Occupational Epidemiology Course at SUNY Albany School of Public Health, April 2012, Rensselaer NY.
- “Bureau of Occupational Health and Injury Prevention – Surveillance and Epidemiology”. Quarterly meeting, NYS Occupational Health Clinic Network, June 2012, Albany NY.
- “Occupational Health Surveillance”. Environmental and Occupational Epidemiology Course at SUNY Albany School of Public Health, April 2013, Rensselaer NY.
- “The Challenge of Identifying Occupational Disease”. Healthy Workers, Healthy Work: The 25<sup>th</sup> Anniversary of the NYS Network of Occupational Health Clinics Conference, September 2013, New York Academy of Medicine, New York, NY.
- “Know Your Community: Improving the Data on Occupational Disease in NYS – The Role of the OHCN”. Healthy Workers, Healthy Work: The 25<sup>th</sup> Anniversary of the NYS Network of Occupational Health Clinics Conference, September 2013, New York Academy of Medicine, New York, NY.

- “Follow-up of Elevated Blood Lead Levels among Pregnant Women”. NYSDOH Center for Environmental Health Manager’s Meeting, September 2013, Albany NY.
- “Occupational Health Surveillance”. Environmental and Occupational Epidemiology Course at SUNY Albany School of Public Health, April 2014, Rensselaer NY.
- “Developing Injury Prevention Materials for the Ski Industry”. CSTE Annual Meeting, June 2014, Nashville TN.
- “Occupational Surveillance in NYS”. Quarterly meeting, NYS Occupational Health Clinic Network, March 2014, Rensselaer NY.
- “Bureau of Occupational Health and Injury Prevention”. Environmental Health Directors meeting, October 2014, Cortland NY.
- “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 Illness in New York State”. CSTE Annual Meeting, June 2015, Boston MA.
- “Evaluating the use of Traumatic Injury Data in Occupational Health Surveillance, New York State”. CSTE Annual Meeting, June 2015, Boston MA.
- “Occupational Health Surveillance”. Environmental and Occupational Epidemiology Course at SUNY Albany School of Public Health, March 2015, Rensselaer NY.

### **Publications**

- Wuellner SE, Walters JK, St. Louis T, Leinenkugel K, Rogers PF, Lefkowitz D, Davis LK, Gelberg KH, Zak MJ, Castillo DN. Nonfatal Occupational Injuries and Illnesses Among Older Workers – United States, 2009. *Morbidity and Mortality Weekly Report* 2011;60(16):503-508.
- Zhu M, Fitzgerald EF, Gelberg KH. Exposure sources and reasons for testing among women with low blood lead levels. *International Journal of Environmental Health Research*. Published online 03 May 2011: <http://dx.doi.org/10.1080/09603123.2010.550035>
- Gelberg KH, Brissette I, Cummings K. Evaluation of a Communications Campaign to Increase Physician Reporting to a Surveillance System. *Public Health Reports* 2011;126(1):19-27.
- Zhu M, Fitzgerald EF, Gelberg KH, Lin S, Druschel C. Maternal low-level lead exposure and fetal growth. *Environmental Health Perspectives* 2010;118(10):1471-1475.
- Scott EE, Pavelchak N, DePersis R. Impact of Housekeeping on Lead Exposure in Indoor Law Enforcement Shooting Ranges. *Journal of Occupational and Environmental Hygiene* 2012;9(3):D45-D51.
- Zhu J, Franko E, Pavelchak N, Depersis R. Worker Lead Poisoning during Renovation of a Historic Hotel Reveals Limitations of the OSHA Lead in Construction Standard. *Journal of Occupational and Environmental Hygiene* 2012;9(8).
- New York State Occupational Health Clinic Oversight Committee. Report to the governor and Legislature. December 2012. [http://www.health.ny.gov/environmental/workplace/occupational\\_health\\_clinic/oversight\\_committee/docs/2012\\_report.pdf](http://www.health.ny.gov/environmental/workplace/occupational_health_clinic/oversight_committee/docs/2012_report.pdf) [Accessed September 9, 2015]
- Fletcher AM, Gelberg KG. An Analysis of Mercury Exposures Among the Adult Population in New York State. *Journal of Community Health* 2013;38(3):529-537.

- New York State Occupational Health Clinic Network Report: Key Updates 2004-2012. [http://www.health.ny.gov/environmental/workplace/occupational\\_health\\_clinic/clinic\\_report/clinic\\_report\\_2004-2012.htm](http://www.health.ny.gov/environmental/workplace/occupational_health_clinic/clinic_report/clinic_report_2004-2012.htm) [Accessed September 9, 2015]
- New York State Heavy Metals Registry, 2006 through 2010. [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) [Accessed September 9, 2015]
- Poster: "Using Worker Focus Groups to Evaluate a Worker Lead Brochure in New York State". CSTE Annual Meeting, June 2014, Nashville TN.
- 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) [Accessed September 9, 2015]
- 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) [Accessed September 9, 2015]

### ***Fact Sheets***

- Arsenic. Understanding Your Arsenic Test Results <http://www.health.ny.gov/publications/0624.pdf> [Accessed September 10, 2015]
- Silicosis: Silica and Road Construction [http://www.health.ny.gov/environmental/workplace/lung\\_disease\\_registry/silicosis\\_road.htm](http://www.health.ny.gov/environmental/workplace/lung_disease_registry/silicosis_road.htm) [Accessed September 10, 2015]
- Lead Poisoning: Lead and Road Construction <http://www.health.ny.gov/publications/2834/index.htm> [Accessed September 10, 2015]
- Health Dangers from Lead on the Job <https://www.health.ny.gov/publications/2543/> [Accessed September 15, 2015]

### ***Conferences***

- An educational conference for health care providers about diagnosing occupational disease was held on September 28<sup>th</sup>, 2012. This conference was developed in conjunction with the OEHC of Eastern New York and the University of Albany, School of Public Health. CME and Continuing Nursing Education credits were available.
- Healthy Workers, Healthy Work: The 25<sup>th</sup> Anniversary of the NYS Network of Occupational Health Clinics Conference, September 18-19, 2013, New York Academy of Medicine, New York, NY. The NYS OHCN celebrated its 25<sup>th</sup> anniversary with a two-day conference/symposium including lectures and hand-on workshops. Topics included general management and analysis of work-related injuries, and the diagnosis and treatment of heavy metal exposure, upper respiratory diseases, musculoskeletal injuries and challenges to mental health including sources of acute work-related stress. CME credits were offered.

## Abstract – New York FACE

**Principle Investigator:** Kitty H. Gelberg, Ph.D., MPH

**Project Director:** Julia Zhu  
New York State Department of Health  
Bureau of Occupational Health & Injury Prevention  
Empire State Plaza  
Corning Tower, Room 1325  
Albany, NY 12237  
518-402-7900  
Julia.Zhu@health.ny.gov

Every year, on average 215 New York workers die from job-related injuries (2003-2011)<sup>1</sup>. 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 the National Institute for Occupational Safety and Health (NIOSH), the New York State Department of Health (NYSDOH), BOHIP 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 New York City). 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 workers. This report summarizes the program activities, significant findings, outcomes and impact between July 2010 and June 2015.

The major program activities were designed and conducted based on the five specific aims:

- Aim 1: Conduct active surveillance to collect workplace fatal injury data;
- Aim 2: Conduct intervention in target areas and investigate work-related fatalities;
- Aim 3: Transform injury research findings into practical intervention products;
- Aim 4: Deliver the intervention products to the workers at risk; and
- Aim 5: Evaluate to which degree the NY FACE injury prevention activities and products are effective.

NY FACE identified 582 work related fatalities, investigated fatal incidents, and developed recommendations for prevention. Two at-risk populations were targeted for intervention – workers, especially farmworkers, who do tree trimming and felling; and ski area workers. Staff provided six free chainsaw safety training classes to farmers and delivered over 12,000 copies of *Logging Safety: A Field Guide* to workers throughout the state. Snowmaking is a high-risk operation. NY FACE developed a comprehensive risk management approach to prevent worker injury. Training posters and cards were developed to address hazards of struck-by, fall, and musculoskeletal injuries associated with snowmaking. The posters and cards were disseminated to ski areas in New York and nationwide.

NY FACE recommendations resulting from a fatality investigation were incorporated in a consensus industry standard that has been used by the Occupational Safety and Health Administration (OSHA) for enforcement. These recommendations can prevent worker fall injuries in construction if adopted.

A total of 82 new intervention products including investigation reports, fact sheets, training posters and cards, trade journal articles, workshops, and presentations were developed and delivered. 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 deliver the injury prevention message to the target populations and make workplaces safer for workers.

## **New York FACE**

### Significant Findings

1) Farmers are at high risk for serious injuries including deaths while doing tree-work.

Farmers perform tree-work using chainsaws and farm equipment such as tractors. They are at high risk for serious injuries due to lack of safety knowledge and resources, and are therefore in dire need for safety training. NY FACE provided six free chainsaw safety trainings (Game of Logging) to the upstate NY farming communities. Among the trainees, 43 percent reported having injuries or near misses and 82 percent never had any safety training. After the training, 94 percent of the trainees demonstrated a better understanding of the hazards and prevention measures and 94 percent indicated a will to change unsafe behaviors.

2) Ski industry workers were at high risk for serious crushing, falling, and struck-by injuries, including deaths.

Ski industry workers in the U.S. had the highest non-fatal injury rate of 16.5 per 100 workers, four times the average injury rate of private industries.<sup>14</sup> New York has the most ski resorts of any state. Most of the mountains are located in economically depressed areas and many workers are from low income backgrounds. The ski industry has a reputation for tolerating risk taking behaviors and not welcoming government involvement. NY FACE created the Ski Areas Worker Safety Project. We worked with Ski Areas of New York (SANY) to promote a safety culture, investigated a snowmaker death, recommended a comprehensive risk management approach, and developed snowmaking safety training posters and cards.

3) Quality control during construction of a precast concrete structure is essential for preventing falls in construction.

Falls are the leading cause of death in construction.<sup>15</sup> NY FACE investigated a case involving an iron worker who was killed after falling three floors when the precast concrete floor slabs collapsed at a construction site. The precast concrete building was constructed by placing and securing precast concrete pieces onto a steel framework which served as a primary structural support. The steel columns were erected out of plumb which resulted in increased spacing between the columns and reduced bearing surfaces for the concrete floor slabs that were placed in-between these columns. The floor slabs collapsed due to insufficient bearing surface. NY FACE proposed prevention measures addressing steel frame structural stability, erection tolerances, worker fall protection, job hazard analysis, and worker training.

### Translation of Findings:

- 1) Behavioral change is a key factor in injury prevention and knowledge is the foundation for behavioral change. Our tree work safety project for farmers demonstrated that once farmworkers learned about chainsaw safety, personal protective equipment (PPE), and safe tree felling and trimming techniques, they were likely to apply and practice tree

work safety on their own. The training opportunities are still very scarce for the upstate rural communities. Until more farmworkers receive the needed safety training, they are still at risk for serious injuries.

- 2) Serious injuries including deaths can occur when snowmakers traverse mountains and descend icy trails on foot. NY FACE proposed a comprehensive approach including engineering, administrative, and environmental controls, PPE, and employee training and supervision to control and manage the risk. As more resorts adopt the recommendations, snowmakers' risk for fatal injuries will be reduced.
- 3) The NY FACE recommendations for preventing falls caused by unstable precast concrete structures can effectively protect workers if adopted. OSHA uses the "Erection Safety Manual for Precast and Prestressed Concrete" developed by Precast /Prestressed Concrete Institute (PCI) as a consensus industry standard for enforcement. If PCI could incorporate NY FACE recommendations into their Safety Manual, more companies would be likely to adopt the recommendations to stay in compliance.

#### Outcomes/Impact:

- NY FACE provided six free Game of Logging (GOL) training classes to upstate farmworkers. GOL was an eight-hour training course focusing on basic chainsaw safety, proper cutting techniques, and tree felling safety. A total of 61 people including dairy, tree farm and landscaping company workers, and agricultural educators attended these classes. The trainees shared stories on why they decided to attend the training which included injuries or close-calls when using chainsaws. Class evaluations demonstrated that the upstate farming communities were in dire need for tree work safety training.
- NY FACE developed Logging Safety: A Field Guide based on the model originally developed by WV FACE. By June 2015, over 12,000 Field Guides had been disseminated to loggers, farmers, workers in highway maintenance, park service, utility, landscaping and nursery industries, wild land firefighters, rural landowners, trade school students, and snowmobile club members throughout the State.
- NY FACE conducted the first ever snowmaking safety class at the Massachusetts Lift Maintenance Seminar. Sixteen snowmakers, supervisors, project managers representing twelve ski resorts in eight states and Canada attended the class. It was also the first time for all trainees to attend a class focusing on worker safety outside his/her resort. All agreed that it was very important to put worker safety on the ski industry's agenda.
- NY FACE developed three snowmaking safety posters and training cards and disseminated them to ski areas in New York State and nationwide.
- NY FACE submitted its recommendations (how to prevent worker death during construction of a precast concrete building) to PCI. Based on the recommended revisions, the PCI Erectors Committee wrote an additional section to the chapter "Project Pre-Planning" of the Erection Safety Manual (2012 version) to include bearing conditions, securing panels, bearing shift, preplanning and surveying of bearing conditions. The Manual has been used by OSHA as a consensus industry standard for enforcement.

## Final Scientific Report – New York FACE

### Background:

Table 1 displays the employment patterns by industry and percentages of fatalities for upstate NY, NYC and the US. These data indicate that upstate NY workers in the agricultural (including forestry and fishing), construction, and public administration industries are at disproportionately higher risk for fatalities as compared to workers in other industries. Construction workers and those in the wholesale and retail trades in NYC had much higher risk for fatal injuries than workers in other industries in the City.

Table 1. Percent of Employment and Fatalities, by Industry, 2012 – US, Upstate NY and NYC<sup>16</sup>

Industries	Employment			Fatalities		
	US	NYC	Upstate NY	US	NYC	Upstate NY
Agriculture, Forestry & Fishing	1.5	0.0	0.5	11.1	---	12.6
Construction	5.8	5.4	4.1	18.3	26.3	14.3
Manufacturing	8.2	3.6	7.1	7.1	---	5.6
Transportation and Warehousing	3.4	5.9	5.3	28	11.8	10.3
Wholesale and Retail Trade	14.1	10.6	12.8	10.3	22.4	5.5
Information	1.8	3.1	2.6	0.9	5.3	0.8
Finance, Insurance, Real Estate, Rental & Lending	5.4	11.3	8.5	2.3	3.9	4
Professional and Business Services	12.3	14.1	12.2	9	5.3	11.1
Education and Health Services	14	25.4	26.1	1.8	5.3	3.2
Leisure and Hospitality	9.5	11	9.3	5.3	3.9	10.3
Other Services	4.2	5.7	5	4.4	5.3	6.3
Public Administration	15	3.9	4.7	5.5	9.2	15.1

NIOSH launched the **Fatality Assessment and Control Evaluation (FACE) program** in 1982. FACE is a research program designed to identify, study and prevent fatal occupational injuries. FACE does not enforce State or Federal occupational safety and health standards, neither does it determine fault or blame. FACE researchers conduct on-site investigations to collect in-depth information to identify risk and causal factors, develop detailed narrative reports describing organizational, behavioral, and environmental factors that contributed to the worker death, and propose recommendations for future prevention.

BOHIP received funding from NIOSH in September 2001 to conduct the NY FACE program in upstate NY. The foundation of the NY FACE program is surveillance which provides accurate and complete fatality data for timely identification of intervention targets. Once the targets are identified, in-depth research is conducted to study an array of contributing

factors that are essential for developing effective intervention measures. Injury prevention product development is crucial for the success of prevention since it bridges the surveillance and intervention processes. Product dissemination is accomplished through working with partners and stakeholders. NY FACE also works closely with these partners to promote product adaptation and implementation. The last program component is evaluation; it is essential for improving the intervention products and increasing the program impact.

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 workers in New York State.

### Specific Aims

**Aim 1.** Conduct active surveillance to collect workplace fatal injury data.

### *Methodology*

Daily on-line newspaper searches were conducted to identify occupational fatality cases. Additional cases were identified from death certificates provided by the NYSDOH Vital Statistics unit. 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. The fatality information were entered into an electronic database (FACE database).

The FACE 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. Staff conducted quarterly case reviews to ensure the accuracy and completeness of the case information. Semiannual data reviews were conducted to monitor trends and identify intervention targets. 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*

- Between July 1, 2010 and June 30, 2015, NY FACE identified 582 work related fatalities. Since the implementation of the study in 2001, NY FACE identified a total 1742 fatal injury cases.
- Monthly fatality announcements were sent out to approximately 1,000 recipients through multiple email lists to raise the awareness of workplace fatal injuries. The recipients represented wide range of industries, varied trade associations, labor unions, occupational health professionals, safety and health specialists, public health offices, as well as governmental organizations.
- Fatal occupational case information was provided to the Labor-Religion Coalition of New York State and Central New York Council for Occupational Safety and Health (CNYCOSH). The information was used by the Coalition to develop brochures to commemorate Workers Memorial Day and by CNYCOSH for a Workers' Memorial Day presentation and a training.

- Staff identified 87 cases of tree work related fatalities between 2002 and 2010 and the case information was shared with the New York Center for Agricultural Medicine and Health (NYCAMH) and Northeast Center for Agricultural and Occupational Health (NEC). The data was used to develop presentations for NY Farm Show and a rural landowners meeting.
- Partnerships are critical for a successful surveillance program. Over the years through NY FACE intervention efforts, partnerships have been formed with US Department of Labor (Wage and Hour Division, OSHA), NYS Department of Labor, Public Employees Safety and Health (PESH), the NYS Association of County Coroners and Medical Examiners, the NYSDOH Bureau of Emergency Medical Services, and the NYS Workers' Compensation Board (WCB).
- To facilitate agricultural fatality case identification, NY FACE had an arrangement with NYCAMH to share its information on all agricultural fatalities and serious injuries.
- Members of the NYS Occupational Health Clinic Network (OHCN) and advisory board members have been utilized as potential reporting sources.
- A good working relationship has been established between NY FACE surveillance staff and the source individuals and organizations, such as coroners/medical examiners, sheriffs and police.

*Discussion/Conclusions:*

During the initial stage of the program, NY FACE dedicated a tremendous effort and significant amount of budget on establishing a comprehensive system of case identification, verification and confirmation to lay a solid foundation for intervention. To make the program known to the reporting sources, NY FACE developed outreach products including brochures describing the program, informational letters, Rolodex cards and magnets with NY FACE contact information. These products were disseminated to all potential reporting sources to raise awareness of the program and promote case reporting. 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.

**Aim 2.** Conduct intervention in targeted areas and investigate work-related fatalities where appropriate prevention methods regarding the hazards are not currently available.

*Methodology*

Preparations for investigation were initiated as soon as the case information was received. Investigations are conducted using the Man-Machine-Environment model.<sup>17</sup> Investigators collected information associated with the agent (the direct causes), the host (the victim), and the surrounding environment to reconstruct the time line 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.

FACE is a research program and participation is completely voluntary. NY FACE investigators asked owners of incident sites to sign a consent form to grant on-site investigations. Confidentiality issues were addressed. All witnesses were asked to review

and indicate their consent on a form approved by the NYS Institutional Review Board prior to their participation. A copy of the form was provided to each witness along with NY FACE contact information in the event they wanted or needed to talk further with the investigator. Information about the NY FACE program were provided to all participants.

Fatality investigation reports were written for every investigation in a format recommended by NIOSH. The reports were distributed immediately upon completion to the employers and other stakeholders. When a company refused, NY FACE informed them of the investigation and offered the company the opportunity to receive the investigation report and other injury prevention products.

### *Results*

For the 2010-2015 funding cycle, NY FACE completed eight fatality investigations; a total of 50 investigations have been completed since 2001. 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.

NY FACE shared the investigation reports with the employers and/or incident site owner, the decedents' families (upon request), appropriate labor unions, the local medical examiner or coroner, any other individual/organization who assisted in the site investigation, OSHA and NIOSH.

### Tree Worker Safety Project

Logging has consistently been one of the most hazardous occupations in the United States.<sup>6</sup> NY FACE recorded 110 tree work related fatalities between 2002 and 2013. We developed a booklet "Logging Safety: A Field Guide" (the Field Guide) in 2009 based on the format originally developed by WV FACE. The Field Guide was pilot tested by the workers of NYS Office of Parks, Recreation and Historic Preservation during the previous grant funding cycle (2005-2010). The trainees strongly agreed (98.6 percent) that the Field Guide helped them understand the training content better, practice safe cutting techniques, and take proper protective measures. During this funding cycle, NY FACE provided tree work safety training to high risk populations and disseminated the Field Guide through collaborating with partners.

### *Game of Logging (GOL) for Farmers Project*

Agriculture is among the most dangerous industries. The fatality rate for farmers was seven times higher than the average fatality rate of private industries in the U.S. (24.8 vs 3.5)<sup>18</sup>. NY FACE recorded 170 farmworker deaths between 2002 and 2014. Farmers perform tree work such as clearing land, cutting firewood, felling and trimming trees on farms. Since many of them are untrained and lack of proper equipment and resource to perform these tasks safely, they are prone to serious injuries including death. The leading

cause of death for farmers nationwide was tractor overturns, accounting for over 90 deaths annually. NY FACE identified that 80 percent of farmer deaths associated with tree work in upstate New York were caused by tractor overturn. Farmworkers were in dire need for tree work safety training that addressed the specific hazards associated with doing tree work using farming equipment such as tractors.

GOL is a training program that teaches logging safety, proper cutting techniques, and conservation through both hands-on and classroom teachings. NY FACE collaborated with Bill Lindloff, a certified GOL instructor, Cornell Cooperative Extension, Herkimer County Soil and Water Conservation District, Black River-St. Lawrence Resource Conservation and Development Council, Inc. (RC&D Council), and NEC in providing six GOL Level I training class to upstate farmworkers. GOL Level I was an eight-hour training course focusing on basic chainsaw safety, proper cutting techniques, and tree felling safety. The classes were provided to farmworkers free of charge. All classes were offered during winter and early spring, a downtime for many agricultural operations, to encourage participation. The training locations were strategically selected to cover representative farming communities.

A total of 61 people including dairy, maple and Christmas tree farm and landscaping company workers and owners, and agricultural educators attended these classes. All trainees expressed great interest in learning the safe cutting techniques and injury prevention measures including using proper PPE. The trainees shared stories on why they decided to attend the training: many of them had injuries or close-calls when using chainsaws and they all agreed that it was imperative to learn the tree-work safety if they wanted to carry on the farm duties without being injured. The evaluation of the classes demonstrated that the upstate farming communities were in dire need for tree work safety training.

NY FACE provided assistance to Resource Conservation and Development (RC&D) Council in obtaining \$9,000 in funding from NEC to provide chainsaw safety workshops for rural farm and land owners. NY FACE had collaborated with RC&D in providing GOL workshops and advised the RC&D of the widespread interest and demand of chainsaw safety training. Based on the model of GOL, RC&D conducted six chainsaw safety workshops attended by 204 people. The trainees ranged from landowners, utility company employees, university grounds crews, maple producers, snowmobile trail crews, ATV trail crews, mountain bike trail crews, hiking trail crews, highway and fire departments. Ages ranged from teenagers to grandparents. Many people commented that they had been operating a chainsaw for years and felt that they knew what they were doing but learned a lot from the workshop. Many people also remarked that they were going to purchase chaps after seeing the safety demonstration. One gentleman from a snowmobile club attended one class and then brought his son and two friends to a subsequent class.

#### Ski Areas Worker Safety Project

Employees of ski facilities in the U.S. had the highest non-fatal injury rate of 16.5 per 100 workers, four times the average injury rate of private industries (2007).<sup>19</sup> NYS has the largest number of ski centers in the US with upwards of 16,500 seasonal employees (85 percent of the payroll in the winter season). Most of these ski mountains are located in

economically depressed areas of the state and workers are mostly from low income backgrounds. The ski industry has a reputation for tolerating risk taking behaviors and not welcoming government involvement. NY FACE established a partnership with SANY, a trade organization representing the ski areas, to develop training materials. We targeted snowmaking operation since workers suffer more serious injuries while performing snowmaking related tasks.

#### *Discussion/Conclusions*

Through conducting fatality investigations, staff addressed the varied hazards including machinery, confined space, slips and falls, and trench collapse. These hazards were encountered by workers in industries ranging from ski, communication, transportation, public works, and restaurant to construction.

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. Some investigations addressed issues related to emergency rescue operations and proposed recommendations for emergency responding organizations. We strongly believe these recommendations can effectively improve worker safety if adopted.

**Aim 3.** Transform injury research findings into practical intervention products through adopting existing products and developing new products.

#### *Methodology*

Our injury prevention product development was guided by the Intervention Product Development Model (Figure 3). During the idea generation stage, NY FACE identified the need for a specific product through reviewing fatal and non-fatal injury data. New OSHA regulations, stakeholder or partner interest, emerging industries, or new technology also served as driving forces for new product development.

The ultimate “customers” of an intervention product are the end users, who dictate the content of the message and the format of the product. The focus of the preliminary product research is the end users. NY FACE researched and learned about the end users’ 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.

Reducing risky behaviors among both employees and employers is a key component of injury prevention. Knowledge, attitude and beliefs are the foundation blocks for behavioral change. For individuals or organizations to replace risky behaviors with safe work practices, they must first be made aware of the potential outcomes of their risky behaviors and the positive outcomes of the safe work practice. The safe work practice has to be feasible and worth undertaking. Both the workers and companies have to be provided with skill, and opportunity as well as the necessary equipment to enact and sustain the new safe

behaviors. Therefore, the best intervention product is the one that is most likely to induce a behavioral change and sustain the new safe practice in an employer as well as an employee.

Based on the best product model that was determined during the previous stage, NY FACE conducted 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 fewer resources such as 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 was identified, NY FACE modified and repackaged the product with the permission of the original author or producer.

If no existing product was available, NY FACE would proceed to the stage of **product design and production**. A feasibility study would be conducted at this stage to assess if we had the technical and financial ability to develop the product. Dissemination venues would be assessed as part of the feasibility study. One important step before final production was to pilot test the prototype through a sample of end users. The prototype would be modified and improved based on the pilot testing results before final production. Partners and stakeholders, especially the ones representing the end users were consulted during each stage of the product development.

### *Results*

- NY FACE collaborated with SANY in developing snowmaking safety training materials. Staff first visited four ski areas to learn about the operation. During these site visits, we observed snowmaking in action and learned from each mountain the best practice for controlling hazards and preventing injuries. Through conducting these site visits, we also established good relationships with the facility owners and managers and laid a solid foundation for future collaboration.
- SANY snowmaking injury data was reviewed and analyzed to identify hazards and high risk populations. Based on the data analysis, we focused on three hazards: struck by, slips and falls, and musculoskeletal injuries. We worked closely with the ski areas in developing the content and selecting the format of the training material. We also worked with National Ski Areas, the trade association that represents the ski areas nationwide in crafting the key injury prevention message. The final products - three posters and four training cards titled “Prevent Struck-by Injuries during Snowmaking”, “Prevent Musculoskeletal Injuries during Snowmaking”, “Prevent Injuries While Travelling across the Snowmaking Area”, and “Footwear Wisdom for Snowmakers” reflected the collaborative effort from both NY FACE and our partners in the ski industry. Products were shared nationally allowing non FACE states to receive the materials.
- NY FACE developed additional injury products such as FACT sheets, trade journal articles, newsletter articles, and presentations based on our fatality investigations. These products helped get the message to larger, broader, and more varied working populations (see the NY FACE Injury Prevention Product List at the end of this section).

### *Discussion/Conclusions*

NY FACE worked closely with partners and stakeholders in developing injury prevention products and making these products more relevant to the users. The cooperation between NY FACE and the end users made the final injury product more likely to be used and adopted.

**Aim 4.** Deliver the intervention products to NYS working populations through Focused Relay Dissemination and promote widespread product implementation with 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 (IR) 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 IR 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 IR 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*

- By June 2015, we have disseminated over 12,000 Field Guides to loggers, farmers, workers in highway maintenance, park service, utility, and landscaping and nursery industries, wild land firefighters, rural landowners, trade school students, and snowmobile club members. The Parks supervisors used the Field Guide for toolbox talks and tailgate training and every field worker has a copy in his/her truck.
- Mr. Lindloff is a certified GOL instructor. Approximately 800 professional loggers, landscapers, nursery workers, farmers and private property owners attended Mr. Lindloff's classes every year. According to Mr. Lindloff, the Field Guide helped the trainees understand the training content. They could review the training content by themselves using the Field Guide that helped them practice logging safety. Mr. Lindloff has disseminated approximately 1,000 Field Guides.
- The course "Principles and Practices of Light Construction" has a portion on Site Development during which the students learn to use chainsaw. After receiving a copy of the Logging Field Guide from a NY FACE staff at the Construction Career Day, the professor ordered the Field Guides for all his 74 students in his class.
- Five hundred copies of Logging Safety: A Field Guide were mailed to NYCAMH. NY FACE collaborated with NYCAMH and Mr. Lindloff in 2010 and 2011 to provide six GOL classes to agricultural workers. NYCAMH continued working with Mr. Lindloff to provide more GOL classes to the upstate rural farming population. The Field Guide was

used as classroom training material for the GOL training. NYCAMH also disseminated them at other statewide agricultural events.

- A hundred fifty copies of Logging Safety: A Field Guide were mailed to a NYS Department of Environmental Conservation (DEC) forest ranger who taught chainsaw safety for DEC forest service throughout the state. He also taught a chainsaw safety course at the New York Wildfire and Incident Management Academy every year. The sponsors of the Academy included the US Forest Service, National Park Service, Federal Emergency Management Agency, Massachusetts Department of Environmental Management and Colorado Wildfire Academy. Wild land firefighters and incident managers across the nation attended Mr. Bodnar's four-day course in the summer and fall every year. Each student was provided with a Field Guide. It was considered to be an excellent resource for the trainees on OSHA requirements, personal protective equipment, and safe and efficient chainsaw cutting techniques.
- Two hundred fifty copies of Logging Safety: A Field Guide were mailed to the NYS Thruway Authority (TA) Employee Safety Representative and were handed out at their annual statewide training. These book have been used by their supervisors to conduct chainsaw safety review sessions for the workers. The following training materials were also provided: Chainsaw Safety for Homeowners, and tailgate training manuals of Confined Space Safety and Mobile Equipment Safety.
- A safety manager for NYS Parks Genesee Region requested for 800 copies of the Field Guide. The Field Guides were to be disseminated to three regions: Allegany, Niagara and Genesee. The manager stated that information in the Field Guide was clear and straightforward. The books were used for toolbox talks and tailgate trainings. They were given out during safety meetings, annual trainings and at the NYS Parks Regional Safety Conference in the Spring of 2013 to students and contractors.
- The President of SANY praised the NY FACE's effort in preventing injuries in snowmaking. SANY disseminated NY FACE's snowmaking cards (150 sets) and posters (100 sets) to all SANY members.
- Five hundred fifty sets of snowmaking training cards and 130 sets of posters were mailed to ski areas in New York. The ski areas used these materials for conducting toolbox talks, refresher training, safety meetings and tailgate training throughout the season.
- The Safety and Health Unit of NYSDEC forwarded the snowmaking posters and cards to Belleayre Ski Center (a state owned ski area) suggesting the Center use them for employee training.
- The snowmaking training cards and posters were mailed to MA FACE (28 sets) and MI FACE (30 sets) for distribution to ski areas in MA and MI.
- The OSHA area director in the Syracuse office forwarded the snowmaking posters and cards to the Deputy Regional Administrator and requested the information be shared with other OSHA Regions. They were then sent to all ten OSHA Regions.
- Three hundred thirty sets of snowmaking safety posters and training cards were mailed to the National Ski Areas Association (NSAA). They were included in the NSAA annual SAFETY WEEK rollout package. The packages were distributed to NSAA members nationwide. NSAA then requested more snowmaking training

cards and posters. NSAA had been disseminating the cards and posters at various conferences throughout the country and more ski areas learned of them. Ski areas in Arizona, California, Colorado, Nevada, Vermont and New Hampshire for employee training. Many of the NSAA members usually did not make that much snow, but they were getting ready to expand their snowmaking operation due to the warmer weather conditions. One hundred fifty posters and 1,600 training cards were mailed to NSAA.

- NY FACE investigation report "*A Department of Public Works Worker and a Volunteer Firefighter Died in a Sewer Manhole*" (10NY060) was distributed to the highway departments and fire companies in central New York areas by NYCAMH.
- Staff sent two NY FACE investigation reports: "*Flagger Dies after being Struck by a Pickup Truck in a Highway Work Zone*" (04NY012) and "*Three Construction Workers Killed after being Struck by a Bus in a Highway Work Zone*" (05NY039) along with the information about NY FACE to the Occupational Safety and Health Specialist of Civil Service Employees Association. Staff met this individual at the Construction Career Day while he was doing a presentation on driving safety in highway work zones. He expressed interest in these reports and wanted to use them for future training.
- Staff presented at the Underground Damage Prevention and Excavation Safety Seminar and discussed NY FACE case "*A Plumber Dies after the Collapse of a Trench Wall*" (07NY033). More than 125 construction company supervisors and workers, excavation contractors, safety and health professionals and representatives of state agencies and OSHA attended the seminar.
- Staff provided assistance to a consultant and trainer with the OSHA Syracuse office who requested information on worker fatalities associated with the concrete and masonry industry. Two NY FACE reports were provided: "*Construction Laborer Dies after Falling off Collapsed Precast Concrete Floor Slab*" (07NY015), and "*Master Stonemason Dies in a 30-foot Fall from a Handmade Work Platform Attached to a Powered Industrial Truck*" (07NY107). The information requested will be used for a workshop presentation.
- NYCAMH identified seven farms that sustained substantial flood damage. Staff provided NYCAMH with "Chainsaw Safety for Homeowners" and the list of NYSDOH handouts addressing flood related issues.
- Staff provided 20 copies of the hazard alert "Fatal Injuries among Animal Handlers in New York State" to the Occupational and Environmental Health Center (OEHC) of Eastern New York for use at a backstretch worker training at the Saratoga Race Track.
- NY FACE staff compiled information on heat-related illnesses and prevention measures. The topics included the types and symptoms of heat illness (cramps, exhaustion and stroke), high risk populations, safety tips for adults, tips for care of children and pets, elderly safety in extreme heat, and worker safety for both indoor and outdoor work. The information were used as a guide for staff in the NYSDOH Center for Environmental Health staff to answer hot weather related phone calls.

- Staff provided NY FACE program information and link to the California FACE webpage: Solar Installation Safety to the Hudson Valley Community College Director of Employee Health Services and the Associate Dean for Hudson Valley Community College Training and Education Center for Semiconductor Manufacturing and Alternative and Renewable Technologies (TEC-SMART). The Solar Installation Safety information was shared with faculty.

### *Discussion/Conclusions*

Dissemination of NY FACE materials 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 products. 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.*** Evaluate to which degree the NY FACE injury prevention activities and products are effective towards promoting safety practices among NYS workers and employers.

### *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

### Improved quality of surveillance:

- NY FACE had established an effective surveillance system and a fatality database that provide timely, accurate, and complete data and served as the foundation for intervention (see Aim 1 for details).

### Increased number of intervention products and increased scientific knowledge for injury prevention:

- NY FACE developed and delivered 82 new injury prevention products including fatality investigation reports, fact sheets, biannual report, training posters and cards, journal articles, newsletter articles, injury prevention updates, workshops, presentations, and monthly worker fatality announcements (see the complete list of NY FACE injury prevention list at the end of this Section).

### Increased utility of existing products:

- The power point slides on construction safety developed by NY FACE staff were used by the Director of Industrial Hygiene Services of OEHC of Eastern New York for a presentation on Construction Safety for the students of Youth Construction Initiative Program in Troy. Two NY FACE reports – *“Three Construction Workers Killed after being Struck by a Bus in a Highway Work Zone”* (03NY039) and *“Construction Laborer Dies after Falling off Collapsed Precast Concrete Floor Slab”* (07NY015) were discussed with the students. Eighteen high school students attended the session.
- NY FACE case report *“City Engineer Killed in Landfill Manhole when Retrieving Flow Meter”* (03NY027) was included in an eight-hour confined space hazard training that was provided by OEHC of Eastern New York to 30 operating engineers in Albany.
- NY FACE investigation report *“A Department of Public Works Worker and a Volunteer Firefighter Died in a Sewer Manhole”* (10NY060) was used by the Program Coordinator and Trainer of L&M Training Center in Syracuse to develop a training curriculum for the Auburn Fire Department.
- The following NY FACE reports were included in the training programs for the OSHA 30 hour construction safety and 16 hour Disaster Site Worker Training in 2014: *“A Department of Public Works Worker and a Volunteer Firefighter Died in a Sewer Manhole”* (10NY060), *“Contractor Crushed against the Cab of Dump Truck by the Dump Body”* (08NY067), *“Crane Boom Collapse Kills Man during Disassembling”* (08NY011), *“Equipment Operator Killed when Pinned to a Tree by an Excavator”* (06NY010), and *“City Engineer Killed in Landfill Manhole When Retrieving Flow Meter”* (03NY027). Both training were provided to the construction workers by the International Union of Operating Engineers Local 106 in Glenmont, New York.
- A compliance officer of the Long Island OSHA office was investigating a fatality that occurred at a landfill. A delivery truck driver for a recycling company was run over by a landfill trash compactor while delivering a load of waste. The dump truck was equipped with a walking floor. The victim got out of his truck to inspect and clean the walking floor and he was struck by the trash compactor when it was backing up. The two NY FACE reports *“Truck Driver Run Over by Trash Compactor in Municipal Landfill”* (02NY007) and *“Truck Driver Buried by Mulch at Town Solid Waste Site”* (06NY084)

were used as reference resources during the investigation and development of the report.

- The following NY FACE reports were incorporated in an OSHA 30-hour construction safety training curriculum: *“Operator Killed when Horizontal Auger Boring Machine Overturned”* (11NY043), *“Crane Boom Collapse Kills Man during Disassembling”* (08NY011), *“Mechanic Killed when Aerial Work Platform Collapses”* (07NY080), and *“Equipment Operator Killed when Pinned to a Tree by an Excavator”* (06NY010). The training was provided to construction workers in 2015 by the International Union of Operating Engineers Local 158 in Glenmont, New York.
- The Director of Industrial Hygiene Service for the OEHC of Eastern New York incorporated the following NY FACE reports into his confined space training curriculum: *“City Engineer Killed in Landfill Manhole when Retrieving Flow Meter”* (03NY027), and *“A Department of Public Works Worker and a Volunteer Firefighter Died in a Sewer Manhole”* (10NY060). The training was provided to operating engineers in collaboration with the International Union of Operating Engineers Local 158 in Glenmont, New York.
- Four NY FACE injury prevention products were included in the annual OSHA list of compliance assistance products for FY 2014 (Oct. 1, 2013 to Sept. 30, 2014): *“Farm Worker Dies during Grain Bin Auger Entanglement”* (04NY121) (report), *“Dairy Farm Owner Dies during Manure Pump PTO Entanglement”* (04NY010) (report), *“Operator Killed when Horizontal Auger Boring Machine Overturned”* (11NY043) (report), and *“Truck Driver Run Over by Trash Compactor in Municipal Landfill”* (fact sheet). The list included many of the products developed by OSHA, Alliance Program participants, NIOSH FACE and state FACE programs.
- EMS Medicine, edited by Derek Cooney (first edition) to be published by McGraw Hill will include a photo and case info from a NY FACE investigation report *“Department of Public Works Worker and a Volunteer Firefighter Died in a Sewer Manhole”* (10NY060).
- OSHA updated its Tree Care Industry webpage and added links to all tree work-related fatality reports completed by NIOSH FACE and state FACE programs. The webpage listed five major categories of fatalities: struck-by, electrocution, falling, caught-in and asphyxia. One NY FACE report *“Guatemalan Tree-Service Worker Killed When Pulled into Brush Chipper”* (05NY034) was listed under category of caught-in.
- A safety and health consultant of Access Compliance in Latham used two NY FACE reports: *“A Department of Public Works Worker and a Volunteer Firefighter Died in a Sewer Manhole”* (10NY060) and *“City Engineer Killed in Landfill Manhole when Retrieving Flow Meter”* (03NY027) to develop confined space safety training materials for his clients.
- The information on heat related illnesses and prevention measures prepared by the NY FACE staff was used to develop a newsletter article *“Keep Cool during Summer Heat”*. The article was published on the July/August issue of Injury Prevention News. It was electronically sent to 550 local public health and traffic safety professionals.
- A consultant/trainer incorporated NY FACE reports into a 30-hour OSHA Construction Safety course. Thirty-five members of Operating Engineers Local 158 attended the training. The trainees got on the NY FACE webpage and selected six fatality reports to view and discuss. The trainees first studied the case summaries and then came up with

their own prevention measures based on the case scenarios. The consultant stated that these reports were great training tools. They held the trainees' interest and kept them engaged and "the trainees loved them".

- A NY FACE report "*Logger Dies after being Struck by a Pickup Truck in a Highway Work Zone*" (04NY012) was incorporated into a 8-hour HAZMAT training curriculum by Hunter College. The training was provided to approximately 250 NYS DEC field and management staff.
- A consultant/trainer incorporated the NY FACE report "*City Employee Killed when Clothing became Entangled around an Unguarded PTO Shaft on a Salt Truck*" (05NY007) into a machine guarding training curriculum. The training was provided to 25 machine operators at Sark Wire Corp. in Albany. The trainees learned the case scenario and discussed the prevention measures. Sark Corp. manufactures copper wire for use in the marine, automotive, aerospace, defense and communications industries.

#### Increased awareness of hazards among stakeholders:

- The owner of Sollecito Landscaping Nursery in Syracuse attended the GOL training in Amboy Center and provided his employee with the Logging Field Guides.
- The owner of BTF-Wholesale and Goderie's Tree Farm requested to host one of the GOL workshops. The tree farm occupies 250 acres of land in Fulton County producing nursery stock, Christmas trees and supporting woodlots. The owner stated that his employees would greatly benefit from the GOL training.
- NY FACE staff coordinated and conducted a snowmaking safety class titled: "Snowmaking Safety-Challenges and Solutions" at the Massachusetts Lift Maintenance Seminar (LMS)". The LMS was an annual event organized by Ski Areas of Massachusetts. The Whiteface Mountain Safety manager, a workers compensation consultant for the Ski Areas of New York (SANY) and NY FACE staff discussed the snowmaking hazards, SANY snowmaking injury data, a worker fatality "*Mechanic Dies after being Pulled into a Snow Thrower*" (07NY013) and injury prevention measures. Sixteen snowmakers, supervisors, project managers representing twelve ski resorts in eight states (CT, MA, ME, NC, NJ, NY, PA and VT) and Canada attended the class. Trainees shared their knowledge and experience in developing and implementing injury prevention measures with each other. It was the first time that LMS offered a snowmaking safety class in its entire history of 35 years. It was also the first time for all trainees to attend a class focusing on worker safety outside his/her resort. One trainee commented that comparing with the chemical industry where he had worked before, safety culture was nonexistent in ski industry. All agreed that it was very important to put worker safety on the ski industry's agenda.
- Staff coordinated and participated in a presentation and panel discussion session at the Ski Expo 2012 hosted by SANY and Pennsylvania Ski Area Association (PSAA) in Greek Peak Ski Resort. The title of the session was "Stay Ahead of Worker Safety". The National Ski Area Association, NYSDOL On-Site Consultation and OSHA participated in the panel discussion. A total of 35 people representing 17 ski resorts in three states (MA, PA and NY) attended the session. They were snowmaking supervisors, ski patrols, risk management and safety directors,

general managers, Vice Presidents for Human Resources and for finance and revenue management and attorneys. Immediately following the presentation, staff reviewed and summarized the feedback that the attendants submitted on the evaluation forms. All wished to attend more classes focusing on resort worker safety at future Expos. Suggestions included adding breakout sessions for in-depth incident/case studies, and discussing accident investigation and prevention step by step. One attendant commented that an entire conference could be dedicated to worker safety. The president of SANY proposed SANY hosting additional worker safety seminars/workshops. A PSAA member considered organizing an annual workshop that would exclusively focus on resort worker safety issues.

- Staff coordinated and participated in a presentation and panel discussion session at the Ski Expo 2014. The title of the session was “Why Worker Safety is a Must for a Successful Resort – Learn from the Experts”. The other presenters were the Director of Risk Management of the National Ski Area Association, the Assistant Area Director of OSHA, the Director of the NYSDOL Division of Safety and Health, Insurance Consulting Expertise, Snow Time Resort and Hunter Mountain. A worker fatality case and several lift-related injury cases along with the elements of resort risk management and safety programs were discussed during the session. A total of 42 people attended the session. The attendees represented 16 resorts, four insurance and risk management firms, and two equipment manufactures in eight states. Ninety percent of those completing the evaluation wanted more training on OSHA compliance assistance, 80 percent on snowmaking safety, 60 percent on slips and falls, and 70 percent on lift maintenance, resort safety programs and worker training. All (100%) would like to attend more sessions like this on resort worker safety.

Increased injury prevention partners:

- After receiving the snowmaking posters and cards, NSAA proposed to share injury data and technical information with NY FACE and collaborate with NY FACE in disseminating the posters and cards nationwide and developing new safety products.
- NY FACE staff received the annual Catalyst Award from Black River-St. Lawrence RC&D Council for NY FACE’s collaboration with the Council to bring logging safety training courses to the farmers, property owners and business owners in the region.
- NY FACE had collaborated with many individuals and organizations in collecting fatality information, researching intervention measures, and developing, disseminating, and evaluating injury prevention products including:
  - American Society of Safety Engineers
  - Capital Region Safety and Health Council
  - Central New York Occupational Health Clinical Centers
  - Cornell Cooperative Extension
  - Empire State Forest Products Association
  - Finger Lakes Occupational Health Services
  - Game of Logging
  - Hunter Mountain
  - Insurance Consulting Expertise

National Institute for Occupational Safety and Health  
National Ski Areas Association  
New York Center for Agricultural Medicine and Health  
New York Logging Training  
NYS Department of Labor  
NYS Parks and Recreation  
NYS Public Employees Safety and Health  
NYS Workers Compensation Board  
Occupational and Environmental Health Center of Eastern New York  
Occupational Safety and Health Administration  
Operating Engineers  
Precast/Prestressed Concrete Institute  
Selikoff Centers for Occupational and Environmental Medicine  
West Mountain  
Whiteface Ski Resort  
Willard Mountain  
Youth Construction Initiative Program

Increased behavior changes among target populations – practice safety more and take less risk:

- During the GOL training in Herkimer, many trainees expressed interest in purchasing PPE following the instructor's discussion on the importance of using PPE. The coordinator of the RC&D and NY FACE staff discussed that a coupon may help the farmers cut the purchasing cost; therefore, encouraging more farmers to invest in PPE. RC&D staff quickly contacted an area logging supplier who agreed to issue 10 percent off coupons to all GOL trainees. Staff provided the trainee contact information to RC&D who immediately mailed the coupons to all trainees. One trainee purchased a pair of chaps.

Increased adoption of recommendations:

- NY FACE's recommendations were officially adopted by the Precast/Prestressed Concrete Institute (PCI) and incorporated into the 2012 version of the PCI manual "Erection Safety for Precast and Prestressed Concrete". PCI develops and maintains the standards for designing, fabricating and constructing precast concrete structure for the construction industry. The Manual, first published in 1995, has been used by the construction industry as a technical and safety standard. OSHA has been using the Manual as a consensus industry standard for enforcement. The NY FACE recommendations that were based on the research conducted while investigating the fatality case "*Construction Laborer Dies after Falling off Collapsed Precast Concrete Floor Slab*" (07NY015) addressed the issues of steel frame structural stability, erection tolerances, worker fall protection and job hazard analysis. The NY FACE recommendations were discussed within a subcommittee of precast Erectors & Safety Personnel from all over the country, and changes to the manual were finalized over two review sessions by the entire PCI Erectors

Committee. Based on the recommended revisions provided by NY FACE, the PCI Erectors Committee wrote an additional section to the chapter “Project Pre-Planning” of the manual to include bearing conditions, securing panels, bearing shift, preplanning and surveying of bearing conditions. These revisions will reduce the possibility of worker fall injuries due to structural instability.

- NY FACE report “*Snowmaker Killed after Sliding off an Icy Trail and Striking a Tree*” (12NY001) was sent to the members of SANY. The Director of a NY ski resort contacted NY FACE to offer feedback. He commented that the report was very thorough and demonstrated that NY FACE had good understanding and knowledge about snowmaking operations. He informed us that his ski resort used the report for worker training. Management also used the report as guidance for evaluating its snowmaking safety program. The ski resort has implemented eight of the nine recommendations proposed by NY FACE. All snowmakers previously wore American National Standards Institute (ANSI) Type I hard hats without chin-straps that offer only top or crown protection against falling objects from overhead. NY FACE recommended that ski resorts provide ANSI Type II Class G hard hats with chin-straps for snowmakers. These hard hats offer both crown and lateral impact protection. After receiving the report, the ski resort provided Type II hard hats with chin-straps to half of the snowmaking crew and will replace the rest of the Type I hard hats next season.
- SANY Lift Maintenance Committee held a conference call to discuss how to improve and strengthen the annual lift maintenance training program. The training program includes demonstration and discussion of six major lift maintenance tasks that are conducted by six resorts selected by the Lift Maintenance Committee. Staff attended several of the training sessions and learned that some of the lift maintenance tools can cause injuries if not used properly. NY FACE suggested the Committee add tool safety into the training program. The Committee adopted the recommendation and will require the host resorts to discuss tool safety during each training.
- GOL-for-Farmers Evaluation: 92 percent (N=61) trainees completed the evaluation form. The evaluation demonstrated a strong need for the training for this population: 43 percent (N=56) reported having injuries or near misses; 82 percent (N=55) never had any logging safety training. The training generated knowledge based changes among trainees: 94 percent (N=51) indicated a better understanding of the logging hazards and prevention measures; and 94 percent (N=53) indicated a will to change unsafe behaviors. One class of ten was given coupons for purchasing PPE from a local safety supplier. One (10%) trainee purchased a pair of chaps (behavioral change).

### *Discussion/Conclusions*

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.

### Occupational Injury Prevention Products Developed by NY FACE

#### **Reports**

- 07NY013: *“Mechanic Dies after being Pulled into a Snow Thrower”*
- 07NY092: *“Newspaper Carrier Killed in a Two-car Head-on Collision”*
- 07NY033: *“A Plumber Dies After the Collapse of a Trench Wall”*
- 07NY107: *“Master Stonemason Dies in Fall from Handmade Work Platform attached to Powered Industrial Truck”*
- 10NY060: *“A Department of Public Works Worker and a Volunteer Firefighter Died in a Sewer Manhole Case Report”*
- 12NY001: *“Snowmaker Killed after Sliding off an Icy Trail and Striking a Tree”*
- 12NY033: *“Restaurant Co-owner Fatally Crushed by a Dumbwaiter Car”*
- 09NY095: *“Tower Erector Killed when Radio Tower Collapsed”*
- *Occupational Fatalities in New York State (07- 08)*

#### **Fatality Fact Sheet**

- *Quick Facts on Death at Work (07- 08)*

#### **Posters**

- *“Prevent Struck-by Injuries during Snowmaking”*
- *“Prevent Musculoskeletal Injuries during Snowmaking”*
- *“Prevent Injuries While Traveling across the Snowmaking Area”*

#### **Training cards**

- *“Prevent Struck-by Injuries during Snowmaking”*
- *“Prevent Musculoskeletal Injuries during Snowmaking”*
- *“Prevent Injuries While Traveling across the Snowmaking Area”*
- *“Footwear Wisdom for Snowmakers” (card)*

#### **Trade Journal Article**

- *“Sewer Manholes Can Kill”*, published by *“Talk of the Towns”*, the bi-monthly magazine of the Association of Towns of NYS in the April/May 2013 issue.
- *“Construction Falls Kill Workers-What You Can Do to Save Lives”*, published by *“Talk of the Towns”* in the July 2013 issue
- *“Prevent Fatal Falls among Public Employees in New York State - The Risk Factors and Prevention Strategies”*, published by *“Talk of the Towns”* in the June 2015 issue
- *“FACE Value – Mechanic Dies after being Pulled into a Snow Thrower”*, published by the National Safety Council magazine *“Safety+Health”*, March 2011.
- *“FACE Value-Master Stonemason Dies in a 30-foot Fall from a Handmade Work Platform Attached to a Powered Industrial Truck”*, published by the National Safety Council magazine *“Safety+Health”*, December 2012.
- *“FACE Value - Operator Killed when Horizontal Auger Boring Machine Overtuned”*,

published by the National Safety Council magazine "Safety+Health", January 2015.

### **Newsletter article**

- "Cooperative Extension Brings Game of Logging to Local Farmers". St. Lawrence County Agricultural News, January 2011.
- "District Brings Game of Logging to Local Farmers" Herkimer Water District Conservation News, January 2011.
- "Remember Your Friends in High Places." Injury Prevention Listserv, April 2012.
- "Chainsaw Safety during Spring Cleaning" Injury Prevention Listserv, April 2012.
- "Bathtub Refinishers and Exposure to Methylene Chloride" Injury Prevention Listserv, February 2012.
- "Older Worker Fatalities" Injury Prevention Listserv, March 2012.
- "Worker Memorial Day 2012"(Injury Prevention Listserv, April 2012.
- "Residential Roofing Falls" Injury Prevention Listserv, July 2012.
- "Prevent Work-related Heat Illnesses" Injury Prevention Listserv, July 2012.
- "It's Almost Summer: Time for Work Zone Safety" Injury Prevention Listserv, June 2013.

### **NY FACE Injury Prevention Updates:**

- *Worker Memorial Day Observance and Stop Construction Falls Campaign* (April issue)
- *Latest development in Stop Construction Falls Campaign* (June issue)
- *NY FACE Injury Prevention Updates (September 2013)*
- *New NY FACE Report and Latest Injury Prevention Products from Our Partners (July 2014)*

### **NYSDOH Commissioner Press Release**

- Worker Memorial Day 2013 (April 2013)

### **Workshops**

- Game of Logging-for-Farmers (GOL) in Ballston Spa on November 12, 2010
- GOL in Herkimer on November 29, 2010
- GOL in Canton on December 10, 2010
- GOL in Ellicottville on February 10, 2011
- GOL in Branchport on February 19, 2011
- GOL in Amboy Center on March 23, 2011

### **Presentations**

- "Game of Logging (GOL) for Farmers". Presented at the NYCAMH Advisory Board meeting, Cooperstown NY, June 14, 2011.
- "Fundamentals of Industrial Hygiene and Occupational Fatal Injury Prevention". Presented at the Environmental and Occupational Epidemiology class in SUNY School of Public Health, East Greenbush NY, March 7, 2011.
- "Prevent Excavation Fatalities: Causes and Solutions - A Case Study". Presented at Underground Damage Prevention and Excavation Safety Seminar hosted by Capital

Region Damage Prevention Council and Dig Safely New York, Albany NY, November 17, 2011. “

- “Industrial Hygiene and Occupational Fatality Prevention.” Presented at Environmental and Occupational Epidemiology class in SUNY School of Public Health, East Greenbush NY, February 8, 2012.
- “Snowmaking Safety-Challenges and Solutions”. Presented at Massachusetts Lift Maintenance Seminar, Jiminy Peak MA, on April 17, 2012.
- “*Confined Space Hazard Awareness*”. Presented at SUNY School of Public Health, East Greenbush NY, October 22, 2012.
- “*Stay Ahead of Worker Safety*”. Presented at 2012 SANY Expo, Greek Peak NY, September 19, 2012.
- “*Fundamentals of Industrial Hygiene and Occupational Fatal Injury Prevention*”. Presented at SUNY School of Public Health, East Greenbush NY, April 10, 2013.
- “*Risk Assessments and Root Cause Analysis*”. Presented at 2013 PEF Annual Safety and Health Conference, Albany NY, April 19, 2013.
- “*Dying at Work in New York*”. Presented at Region II Voluntary Protection Program Participants’ Association (VPPPA) 21st Annual Safety & Health Meeting, Saratoga Springs NY, April 30, 2013.
- “*Quality Data Saves Lives.*” Presented at the biannual education conference entitled “Tools of the Trade”, sponsored by the New York State Association of County Coroners and Medical Examiners, Rochester NY, September 21, 2013.
- “*Confined Space Awareness*”. Presented at SUNY School of Public Health, East Greenbush NY, October 28, 2013.
- “*IH Fundamentals and Workplace Fatality Prevention*”. Presented at SUNY School of Public Health, East Greenbush NY, April 7, 2014.
- “*Dying at Work-Occupational Fatalities in New York*”. Presented at Workers Memorial Day Commemoration Event sponsored by the Capital District Area Labor Federation, Saratoga Springs NY, April 26, 2014.
- “*Developing Injury Prevention Materials for the Ski Industry*”. Presented at Council of State and Territorial Epidemiologists Annual Meeting, Nashville TN, June 22, 2014.
- “*Why Worker Safety is a Must for a Successful Resort – Learn from the Expert*”. Presented at SANY Expo 2014, Hunter Mountain NY, September 24, 2014
- “*Dumbwaiter Can Kill – A Case Study*”. Presented at Center for Environmental Health, Albany NY, January 28, 2014.
- *Fundamentals of Industrial Hygiene and Occupational Fatal Injury Prevention. Presented at SUNY School of Public Health, East Greenbush, NY, April 13, 2015.*
- “Providing High Risk Populations with Tree-work Safety Knowledge-A Public Health Approach for Injury Prevention”. Poster presented at the FACE Annual Conference in Morgantown, WV presented on October 19-21, 2010.
- “*Game of Logging for Farmers*”. Poster presented at 2012 Occupational Health Surveillance Partners Meeting in Tampa FL, Dec. 5-6, 2012.
- “*Ski Industry Injury Prevention Project*”. Poster presented at 2013 FACE annual meeting in Morgantown VA, May 21-24, 2013

### ***Worker Fatality Monthly Announcements (17)***

## Cumulative Inclusion Enrollment Report

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

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

**Comments:**

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										0
Asian	1	7								8
Native Hawaiian or Other Pacific Islander										0
Black or African American	2	27								29
White	27	305		3	37					372
More Than One Race										0
Unknown or Not Reported	8	84								92
<b>Total</b>	<b>38</b>	<b>423</b>	<b>0</b>	<b>3</b>	<b>37</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>501</b>

## **Abstract – New York Pesticide Poisoning Program**

**Principle Investigator:** Kitty H. Gelberg, Ph.D., MPH

**Project Director:** Karen Cummings, MPH  
New York State Department of Health  
Bureau of Occupational Health & Injury Prevention  
Empire State Plaza  
Corning Tower, Room 1325  
Albany, NY 12237  
518-402-7900  
Karen.Cummings@health.ny.gov

The New York State (NYS) pesticide poisoning program is a surveillance system designed to address occupational and public health issues concerning pesticides. As a result of the widespread availability and use of pesticides, accidental and/or intentional poisonings that require medical treatment continue to occur. During the project period, there were over 1,100 reports of pesticide poisonings made to the program.

The program strived to improve and expand reporting and case ascertainment to better understand the burden of pesticide poisonings. It increased efforts to obtain data from poison control centers, which became the main source of this data. Other sources of data included workers' compensation, adverse health effects information from pesticide product registrants, and hospital and emergency department data.

The program was committed to sharing data with state and federal partners. The data was provided annually to the NYS Department of Environmental Conservation for use in their pesticide program activities. The New York State Department of Health (NYSDOH) Bureau of Toxic Substance Assessment used the data in their activities on exposure assessment. Data was provided annually to NIOSH and was combined with data from other pesticide surveillance states for use in publications and to impact policy and regulations. Findings from this state combined data were extensively cited as justification for the revisions to the Worker Protection Standard, the federal regulations to reduce pesticide-related health risks among agricultural workers.

The program also aimed to protect agricultural workers by collaborating with partners to provide respiratory protection training, medical clearance, and fit testing to farm workers and farm owners, in both English and Spanish. Appropriate personal protective equipment (PPE) is a component of the Worker Protection Standard. Respirator masks and other PPE can protect against hazards, including pesticide exposure, and significantly reduce the risk of illness or injury.

While program efforts successfully increased case ascertainments, the number of pesticide poisonings due to workplace exposures remained low. Nonetheless, the program was able to use surveillance data to identify and address issues being faced by the general public.

Data identified building managers and property owners unlawfully applying pesticides that resulted in adverse health effects. Information about the laws and helpful tips on pest management was developed into a guide that was widely distributed. During the project period, pesticide misuse to combat bed bugs emerged as an area of concern. A web page that addressed these issues and offered alternative pest management practices was developed, and articles to raise awareness of the problem was published. Other common exposures reported included adverse health effect to flea and tick products and lice treatment products. While often minor health effects were reported, the program received hundreds of reports associated with these products and developed outreach materials to address these issues. The materials were made available on the NYSDOH website and a one-month social media campaign resulted in over 10,000 page views, indicating that social media may be an effected method to reach the general public.

## **New York Pesticide Poisoning Program**

### Significant Findings

- 1) Surveillance data identified unlicensed applications by building managers and landlords that resulted in pesticide exposure.

While routine pest management may be an integral part of maintaining rental property, landlords and property managers should be aware that their use of pesticide is regulated by the New York State Environmental Conservation Law (ECL Article 33 §33-0905). When landlords and property managers become aware of a pest infestation, the first thought may be to exterminate the pests. However, the Environmental Conservation Law states that a person may only apply pesticides to the individual dwelling unit (e.g., house or apartment) in which they reside, unless they are a certified commercial applicator.

- 2) Bed bugs may not pose a public health threat but the misuse and abuse of pesticides to treat bed bugs is a concern.

Data indicated that off-label use of pesticides not designed to treat bed bugs was being used, as well as an increase in restricted use products to treat bed bugs used by unlicensed individuals.

- 3) Adverse health effects from flea and tick control treatments was a common exposure reported to the Pesticide Poisoning Registry and the two New York State poison control centers (PCCs).

Staff identified over 500 calls to the NY PCCs where flea and/or tick was in the product name. While the majority of the calls had symptoms mild enough to be treated at home, 16 percent were referred to and/or treated at a health care facility.

- 4) Adverse health effects from lice control treatments was a common exposure reported to the Pesticide Poisoning Registry and the two New York State PCCs.

There were over 200 exposure calls to a New York poison control center regarding lice treatment. While the majority of the calls had symptoms mild enough to be treated at home, 22 percent were referred to and/or treated at a health care facility.

### Translation of Findings

- 1) Information about the NYS Environmental Conservation law on pesticide application in multi-unit dwellings and helpful tips on pest management was developed into a guide that was widely distributed.
- 2) Pesticide misuse to combat bed bugs emerged as an issue that needed to be addressed. A web page that addressed these issues and offered alternative pest management practices was developed, and a number of articles to raise awareness of the problem were published.
- 3) Reports of adverse health effects from flea and tick control products led to the development of outreach materials including a fact sheet and webpage that were promoted through a month-long Facebook Ad and Google Ad campaign.
- 4) In response to reports of adverse health effects from lice control products, outreach materials including a fact sheet and webpage were developed along with a month-long Facebook Ad and Google Ad campaign to promote the materials.

### Intermediate Outcomes:

- The *Landlord and Tenant's Guide to Pest Management* was developed and distributed to housing authorities, county health departments, statewide landlord and tenant associations, and outreach and education specialists with Cornell Cooperative Extension. It is available on the NYDOH website and through the NYSOH distribution center. [www.health.ny.gov/publications/3204/index.htm](http://www.health.ny.gov/publications/3204/index.htm) [Accessed September 22, 2015]
- Bedbugs <http://www.health.ny.gov/environmental/pests/bedbugs.htm> [Accessed September 28, 2015]
- *Battle Against Bed Bugs Worse Than Their Bites? Reports of Pesticide Injuries* was published in the NYSDOH newsletter
- Acute Illnesses Associated with Insecticides Used to Control Bed Bugs – Seven States, 2003-2010. MMWR 2011; 60(37):1269-1274.
- *Take Care When Using Flea and Tick Control Products* [www.health.ny.gov/environmental/pests/fleatick.htm](http://www.health.ny.gov/environmental/pests/fleatick.htm) [Accessed September 22, 2015]
- During the one month Facebook Ad and Google Ad campaign, the flea and tick product poisoning prevention materials received approximately 6,000 page views.
- *Take Care When Using Lice Control Products* [www.health.ny.gov/environmental/pests/lice.htm](http://www.health.ny.gov/environmental/pests/lice.htm) [Accessed September 22, 2015]
- During the one month Facebook Ad and Google Ad campaign, the lice control product poisoning prevention materials received approximately 4,000 page views.

## Final Scientific Report – Pesticide Poisoning Program

### Background

The New York State (NYS) Pesticide Poisoning Registry (PPR) is a surveillance system designed to address occupational and public health issues concerning pesticides. This registry was created by legislation in 1991 and is one of several environmental disease registries. Housed within the NYS Department of Health (DOH), Bureau of Occupational Health and Injury Prevention (BOHIP), the registry draws upon a set of core professional capabilities in Industrial Hygiene, Information Technology, and Epidemiology.

The Registry is designed to accomplish several tasks:

- 1) Conduct surveillance.
- 2) Collect and enter data from interviews in a form consistent with national standards.
- 3) Intervene to prevent ongoing or future poisonings.
- 4) Conduct research to develop generalizable knowledge in specific occupations and industries.
- 5) Conduct research on health effects reported during poisoning events.
- 6) Provide assistance to regulatory agencies on pesticide products.

Pesticides are defined as any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating pests.<sup>20</sup> They comprise an integral component of crop and health protection programs. Pesticides are usually categorized on the basis of their target. The major classes are insecticides, herbicides, rodenticides, and fungicides. Many pesticides are toxic to species – including humans – other than their target species.<sup>21</sup> Non-target species are affected because they possess physiological and/or biochemical systems similar to those of the target organisms. As a result of the widespread availability and use of pesticides, accidental and/or intentional poisonings that require medical treatment continue to occur.

For these reasons, surveillance of pesticide poisonings remains a critical public health function. Surveillance can produce data products that are useful for directing preventive action. It is important to continue to strive to improve and expand reporting and case ascertainment to better elucidate the burden of pesticide poisonings, both in the workplace and in the community. It is even more important to use the data collected to guide outreach efforts to provide education and support to affected patients, health care providers, workers, employers, and the general public, and to conduct interventions to improve workplace safety and assist in the adoption of hazard prevention practices to help assure the future health and safety of workers and others. State-based pesticide illness surveillance systems, like the NYS PPR, have proven valuable by using their data to help foster recognition of new populations at risk from exposure, emerging problems with pesticide products, and the persistence of previously identified problems.

Pesticide poisoning is a reportable condition in NYS (State Sanitary Code, Parts 22.11 and 22.12). Physicians, health facilities and clinical laboratories are mandated to report suspected or confirmed pesticide poisoning cases within 48 hours. Laboratories must

report depressed cholinesterase levels and elevated levels of pesticides in human tissue samples.(Appendix C) Reporting to the environmental disease registries is mandated by NYS law. Thus the registries fall under the HIPAA exemption for public health (45 CFR 164.512(b)).

### Specific Aims

**Aim 1.** Continue outreach to physicians, hospitals, migrant labor clinics, emergency departments and other potential sources to improve case ascertainment for sentinel event surveillance.

### *Methodology*

The Pesticide Poisoning program was committed to the identification of cases related to pesticide poisonings, as well as raising awareness about the reporting requirements among health care professionals. Cases were ascertained from a variety of sources including:

- Health Care Professionals: Under Part 22 of the NYS Sanitary Code, every physician, health care facility and clinical laboratory in attendance on a person with confirmed or suspected pesticide poisoning must report such occurrence to the NYSDOH within 48 hours.
- Medical Records Departments: Utilizing criteria provided by the Pesticide Poisoning Registry (PPR), hospital medical records departments queried their data systems on a monthly basis to identify patients. A copy of the medical record was provided to the PPR.
- Hospital discharge and ED visit data: The PPR utilized this dataset to identify unreported cases. Medical records were requested and reviewed.
- FIFRA 6(a)(2): The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) requires pesticide product registrants to submit adverse effects information about their products to the Environmental Protection Agency (EPA). These reports were received and reviewed in order to identify adverse events that have occurred in NYS.
- National Toxic Substance Incidence Program: Incidents related to pesticides were reported to the PPR.
- NYS Workers Compensation: Through a MOU with the NYS Workers' Compensation Board, we gained access to their eCase system, an electronic case file system. Criteria to identify appropriate pesticide related cases was established.
- Poison Control Centers: See Aim 2

In order to improve reporting, physician outreach was targeted to specific populations that are most likely to encounter pesticide poisonings. These were migrant worker clinics, emergency room physicians, hospital risk managers and urgent care facilities. The outreach materials included informational brochures, telephone sticky notes with the NYS PPR toll-free phone number, and a printed copy of the Environmental Protection Agency's (EPA) "Recognition and Management of Pesticide Poisonings".

## *Results*

- During the project period 1,137 cases of pesticide poisoning were identified, the majority (90%) were not work-related.
- The PPR brochure was updated and printed for distribution. It contained more detailed information about the purpose of the PPR, reporting requirements and how it relates to public health.
- An outreach campaign to health care facilities medical records/health information units was conducted requesting that they review their current reporting procedures to ensure compliance with reporting requirements.
- Information on the recognition, diagnosis, and reporting of a pesticide poisoning was provided to 265 emergency room departments in hospitals across NYS. The mailing contained a reminder notification packet that included state reporting requirements, HIPAA compliance information, information on the PPR, and resources available to diagnose and treat suspected or confirmed pesticide poisoning.
- An outreach occurred to migrant health centers located in NYS aimed at reminding them of the pesticide poisoning reporting requirements.
- Twenty managed care, health care, and medical organizations received articles for use in their newsletters and websites. Topics included diagnosing occupational diseases, reporting to the PPR, and educating patients about occupational hazards and exposures.
- Direct reports were received from EDs and physicians in attendance of a patient with health effects resulting from a pesticide exposure.
- Hospital discharge and ED data was reviewed to identify possible pesticide poisoning cases that were not reported to the PPR. The medical records were requested and reviewed to identify pesticide poisoning cases that met the national criteria.
- BOHIP entered into a Memorandum of Understanding with the WCB that allowed access to eCase to view the electronic case folders of claimants with pesticide poisoning.
- Criteria to identify appropriate pesticide related cases was established and WC claims information was reviewed in eCase.

## *Discussion/Conclusions*

Physician reporting of pesticide poisonings continued to be a challenge. The use of multiple data sources is important for a comprehensive data system for pesticide poisoning.

**Aim 2.** Implement a new mechanism for obtaining pesticide poisoning reports from the five PCCs in NYS. The new mechanism, described in detail, provides direct, secure access to the National Poisoning Data System (NPDS) for NYS PCCs.

## *Methodology*

During the project period, consolidation of the PCCs occurred and there are now two Poison Control Centers in NYS, Upstate New York Poison Control Center and New York City Regional Poison Control Center. Mechanisms for obtaining PCC data were established.

Reports were received on pesticide-related calls from the two PCCs located in NYS. The mechanism for receiving these reports was different for each of the two programs. Upstate New York Poison Control Center calls involving pesticides were identified daily through

NPDS but required follow-up with the PCC because no identifiers are in NPDS. The NYC Regional Poison Control Center reported directly to the PPR on a monthly basis. These reports contain the identifiers, when available.

### *Results*

- Almost half the reports to the PPR came from PCCs and have contributed to a substantial increase in the number of reports received.
- Upstate New York Poison Control Center: PCC/NPDS data surveillance definitions were set up so that a message would be sent daily indicating if a pesticide call had been received. The PCC was then contacted to obtain further information on the call. When a caller received treatment through a medical facility, the facility was contacted for further information.
- New York City Regional Poison Control Center: The NYC PCC is located within the NYC Department of Health and Mental Hygiene. A mechanism to access the pesticide-related poisoning control data through their Environmental Data Exchange Network was established. The information was received monthly and contained identifiers, when available. If a caller received treatment through a medical facility, the facility was contacted for further information.

### *Discussion/Conclusions*

In the absence of resources, PCC data may be adequate for programs to gain an understanding of the issues in their state. Throughout the project period, PCCs became the main source of reports on pesticide poisonings in NYS. The NPDS has information on substances, symptoms, and severity, as well as an indication whether the exposure was work-related. This information can give a general overview of the problems occurring in states. If cases are identified as high priority, follow-up with the PCCs, and possibly treatment facilities, can be conducted to obtain more detailed information.

**Aim 3.** Continue to utilize registry reports and surveillance data to: 1) guide public health interventions, 2) provide outreach and intervention services to ensure appropriate follow-up and care for affected individuals, 3) prevent ongoing or future exposures, 4) recommend best work practices in identified high-risk occupations and industries, and 5) protect other workers and members of the public who may be at risk.

### *Methodology*

The NYS PPR reviewed data for patterns that could indicate an emerging or unrecognized problem and to identify areas where the public needed education on the proper use and application of pesticides. The program used this data to guide development of education materials and outreach activities. In addition, data was provided to multiple state and federal programs for use in their activities.

### *Results*

- Data was annually provided to the National Institute for Occupational Safety and Health (NIOSH) and the NYS Department of Environmental Conservation (DEC) for use in their

pesticide poisoning activities. The NYSDOH Bureau of Toxic Substance Assessment continued to use the data in their activities on exposure assessment.

- Annually, the NYS DEC was provided data on work-relatedness and activity at time of exposure. The data was included in annual reports to Region 2's US EPA Office of Pesticide Programs. This office collects pesticide exposure and incident data from a variety of sources including the States and may use it in pesticide-related reports and decision making.
- Data on adverse health effects from disinfectants used to control mold was provided to the NYSDOH Bureau of Toxic Substance Assessment. In NYS, certification was not required for the application of disinfectants, and the impact of this lack of certification was under-review.
- De-identified pesticide poisoning data was provided to two students with the University of Medicine and Dentistry of New Jersey for use during their internships at the USEPA.
- Data indicated that off-label use of pesticides not designed to treat bed bugs was being used, as well as an increase in restricted use products to treat bed bugs used by unlicensed individuals. In response to this emerging issue, we developed a web page that addressed these issues and offered alternative pest management practices. While bed bugs may not pose a public health threat, the misuse and abuse of pesticides to treat bed bugs is becoming a public health issue.
- The program produced *The Landlord and Tenant's Guide to Pest Management* after registry data identified unlicensed applications by building managers and landlords that resulted in pesticide exposures. The brochure summarizes and explains the NYS Environmental Conservation law on pesticide application in multi-unit dwellings and provides helpful tips on pest management. Target audiences for this message include homeowners, tenants and landlords. The guide was distributed to housing authorities, county health departments, statewide landlord and tenant associations, and outreach and education specialists with Cornell Cooperative Extension.
- The program partnered with the NYS Community Integrated Pest Management Coordinating Council at Cornell University and met bi-annually with the group to discuss pesticide-related priorities and needs.
- The NYSDOH pesticide poisoning website was updated. A concerted effort was made to have all department pesticide-related information accessible from one location to make it easier for consumers to locate relevant pesticide poisoning information.
- A new webpage was developed titled Pests, Pesticides, and Repellents. The aim of the page is to reduce pesticide exposure and instruct on ways to manage pests.
- A new fact sheet "Take Care When Using Flea and Tick Control Products" was developed along with a corresponding webpage. The resources aim to reduce poisonings from flea and tick control treatments, a common exposure reported to the PPR and the two NYS PCCs.
- A new fact sheet "Take Care When Using Lice Control Products" was developed along with a corresponding webpage. The resources aim to reduce poisonings from lice control treatments, a common exposure reported to the PPR and the two NYS PCCs.
- In collaboration with the Health Education and Outreach Unit, a month long outreach campaign was initiated using targeted Facebook posts and google search ads to direct traffic to the newly created webpages. During the one month campaign period, the flea

and tick webpage received approximately 6,000 page views and the lice page received approximately 4,000 page views.

- Information on the hazards of foggers was featured on the NYSDOH Facebook and Twitter posts during fire prevention week with links to our fact sheet and contact information for the pesticide program.
- We provided outreach materials at various fairs and community events including Workers Rights Awareness Weekend, Occupational Health Awareness Week, Empire Farm Days and the New York State Fair.
- Educational materials on how a pesticide applicator/handler should handle their clothing was provided to a migrant services program manager for distribution to migrant workers.
- We responded to public inquiries regarding potential health effects associated with the use of pesticides.

#### *Discussion/Conclusions*

Dissemination of materials and sharing of information is an important component of an occupational health and safety program. The Pesticide Poisoning Prevention Program engaged in a number of activities to disseminate information on topics where surveillance data identified a problem. The program was also committed to sharing data with state and federal partners for use in their pesticide poisoning prevention activities. Data is provided annually to NIOSH and is combined with data from other SENSOR Pesticide states for use in publications and to impact policy and regulations. SENSOR-Pesticides findings were extensively cited as justification for the revisions to the Worker Protection Standard, the federal regulations to reduce pesticide-related health risks among agricultural workers. Data was also used to justify changes in regulations on certification and training of pesticide applicators to ensure the competent use of “restricted use” pesticides.

**Aim 4.** Interview cases and provide education to affected individuals and pesticide handlers in the use of personal protective equipment (PPE), possible integrated pest management options, and the mechanism for reporting persons (licensed or unlicensed) who misapply or mishandle pesticides.

#### *Methodology*

Staff provided consultative services and information to affected employees, employers, environmentally-exposed individuals, and health care providers. These services included telephone consultation to discuss health and safety measures that can minimize or prevent pesticide exposures, provision of informational materials, and/or referral to a NYS Occupational Health Clinic, if appropriate. Industrial hygiene staff were available to discuss situations with the employer when interviewed employees agree to have the employer contacted, or when the confidentiality of the reported case could be maintained.

#### *Results*

- Interviews were attempted with cases, if reported in a timely manner. The intervention included a discussion of how they were exposed and methods to prevent future exposure including discussions on using alternative pest management practices (e.g.,

keeping spaces clean, caulking holes to prevent entry of pest, etc.). Educational materials were also sent when applicable.

- A written questionnaire was developed to send cases that were unreachable by phone.
- All occupational cases were sent information on the OHCN and IH services.
- We worked with NYSDEC Bureau of Pest Management and the NYSDOH Bureau of Toxic Substance Assessment regarding cases of improper application, and misuse or abuse of pesticides. Also, relevant information was supplied to the National Toxic Substance Incidence Program for use in their activities.

### *Discussion/Conclusions*

Having resources to assist in preventing continued exposure is necessary. Various partnerships provided us with regulatory assistance, medical consultations, and toxicology expertise. By interviewing cases we were able to identify needs and make appropriate referrals.

**Aim 5.** Update and improve the SENSOR Pesticide Incident Data Entry and Reporting (SPIDER) software program.

### *Methodology*

The NYSDOH developed, maintained, updated and improved the SENSOR Pesticide Incident Data Entry and Reporting (SPIDER) software program. In 1998, this program was first made available to states conducting pesticide poisoning surveillance and allowed for uniform collection of pesticide poisoning incidents across the country. In 2012, Dr. Stone, the individual responsible for the development and updates of SPIDER, retired. The SPIDER software had been developed in FoxPro and other staff did not have the programming knowledge to continue with the updates. Dr. Stone continued to update the program on his own.

### *Results*

- Updated versions of SPIDER were provided to NIOSH and state partners, typically at the annual grantee meeting.
- SPIDER was periodically updated to include all new EPA product data.
- NIOSH Sector names were added to the Industry code table to enable data grouping by sector.
- A second Cross tab tool (SPIDER xTab2) was added, dedicated to retrieving data based on product type, signal word, chemical class or active ingredient.
- The age variable was recoded to distinguish between when the age was missing and the age was <0.1 year.
- Two new fields, latency and first care, were added to SPIDER.
- A new data retrieval tool was developed to automatically produce all tables and charts used by states for annual reports. This tool moved SPIDER data query results to Excel, and built a formatted table and corresponding chart.

### *Discussion/Conclusions*

SPIDER is a comprehensive software program that has been adopted by many states conducting pesticide surveillance. NYSDOH no longer has the expertise or infrastructure to continue to support the program.

### Occupational Injury Prevention Products Developed by NYS Pesticide Poisoning Prevention Program

#### **Presentations**

- “*Pesticide Poisoning Surveillance: New York State Update*” was presented at the SENSOR-Pesticides 2014 Winter Workshop held in Lakewood, CO in January 2014.
- “*Pesticide Poisoning Surveillance: New York State Update*” was presented at the SENSOR-Pesticides 2015 Winter Workshop held in New Orleans in February 2015.

#### **Publications**

- Lee S-J, Mulay P, Diebolt-Brown B, Lackovic MJ, Mehler LN, Beckman J, Waltz J, Prado JB, Mitchell YA, et al. Acute illnesses associated with exposure to fipronil-surveillance data from 11 states in the United States 2001-2007. *Clinical Toxicology* 2010; 48:737-744.
- Lee S, Mehler L, Beckman J, Diebolt-Brown B, Prado J, Lackovic M, Waltz J, Mulay P, Schwartz A, Mitchell Y, Moraga-McHaley S, Gergely R, Calvert GM. Acute Pesticide Illnesses Associated with Off-Target Pesticide Drift from Agricultural Applications: 11 States, 1998-2007. *Environmental Health Perspectives* 2011; 119(8):1162-1169.
- Acute Illnesses Associated with Insecticides Used to Control Bed Bugs – Seven States, 2003-2010. *MMWR* 2011; 60(37):1269-1274.
- Kasner EJ, Keralis JM, Mehler L, Beckman J, Bonnar-Prado J, Lee SJ, Diebolt-Brown B, Mulay P, Lackovic M, Waltz J, Schwartz A, Mitchell Y, Moraga-McHaley S, Roisman R, Gergely R, Calvert GM. Gender differences in acute pesticide-related illnesses and injuries among farmworkers in the United States, 1998-2007. *American Journal of Industrial Medicine* 2012; 55:571-583.
- Hudson NL, Kasner EJ, Beckman J, Mehler L, Schwartz A, Higgins S, Bonnar-Prado J, Lackovic M, Mullay P, Mitchell Y, Larios L, Walker R, Waltz J, Moraga-McHaley S, Roisman R, and Calvert GM. Characteristics and Magnitude of Acute Pesticide-related Illnesses and Injuries associated with Pyrethrin and Pyrethroid Exposures, 11 states, 2000-2008. *American Journal of Industrial Medicine* 2014; 57:15-30.
- Notes from the Field: Acute Illness Associated with Use of Pest Strips — Seven U.S. States and Canada, 2000–2013 *MMWR* 2014; 63(02);42-43.
- Battle Against Bed Bugs Worse Than Their Bites? Reports of Pesticide Injuries. Published in the NYSDOH Insider newsletter.
- Diagnosis of Occupational Diseases. Published on the New York County Medical Society website.
- Pesticide Poisoning: A Reportable Disease in New York State. Published in the March/April 2013 Member Update newsletter of The County Medical Societies of Broome, Delaware, Otsego and Tompkins Counties.

### ***Other Outputs***

- Landlord and Tenant's Guide to Pest Management  
[www.health.ny.gov/publications/3204/index.htm](http://www.health.ny.gov/publications/3204/index.htm) [Accessed September 22, 2015]
- Bedbugs <http://www.health.ny.gov/environmental/pests/bedbugs.htm> [Accessed September 22, 2015]
- NYSDOH Pesticide Poison Registry Website  
[www.health.ny.gov/environmental/workplace/pesticide\\_poisoning\\_registry](http://www.health.ny.gov/environmental/workplace/pesticide_poisoning_registry) [Accessed September 22, 2015]
- Take Care When Using Flea and Tick Control Products  
[www.health.ny.gov/environmental/pests/fleatick.htm](http://www.health.ny.gov/environmental/pests/fleatick.htm) [Accessed September 22, 2015]
- Take Care When Using Lice Control Products  
[www.health.ny.gov/environmental/pests/lice.htm](http://www.health.ny.gov/environmental/pests/lice.htm) [Accessed September 22, 2015]

## Cumulative Inclusion Enrollment Report

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

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

**Comments:**

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	2	0	0	0	0	0	0	0	0	2
Asian	13	9	1	0	0	0	0	0	0	23
Native Hawaiian or Other Pacific Islander	0	0	0	0	0	0	0	0	0	0
Black or African American	30	36	0	3	1	0	0	0	0	70
White	256	246	3	56	72	1	2	7	0	643
More Than One Race	1	0	0	0	0	0	0	0	0	1
Unknown or Not Reported	6	4	0	5	10	1	207	151	14	398
<b>Total</b>	<b>308</b>	<b>295</b>	<b>4</b>	<b>64</b>	<b>83</b>	<b>2</b>	<b>209</b>	<b>158</b>	<b>14</b>	<b>1,137</b>

## **Abstract – New York Work-Related Asthma Program**

**Principle Investigator:** Kitty H. Gelberg, Ph.D., MPH

**Project Director:** Karen Cummings, MPH  
New York State Department of Health  
Bureau of Occupational Health & Injury Prevention  
Empire State Plaza  
Corning Tower, Room 1325  
Albany, NY 12237  
518-402-7900  
Karen.Cummings@health.ny.gov

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 1,200 new cases of WRA identified in workers over the five-year project period. This is an underestimate of the actual number of individuals with WRA in NYS. Occupational health indicator data from NYS have estimated that approximately 40 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 developing a webcast that provided continuing education credits, publishing articles in medical society and health organization newsletter, 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 established partnerships and memorandums of understanding to obtain the data.

The WRA surveillance program collaborated with the NYS Asthma Program and other partners in the development and distribution of asthma related materials that would assist patients in identifying their triggers as well as talking with their physician about their asthma. One of the most widely requested materials was the "*Is Your Asthma Work-related?*" brochure, with over 13,000 copies requested from the NYS Department of Health Distribution Center during the project period.

There have been over 300 substances (i.e., asthmagens) documented to either cause asthma or exacerbate asthma in people who already have the condition. In NYS, cleaning materials were identified as a common source of the work-related asthma reports and accounted for 15% of the confirmed cases. Workers using cleaning products were at risk, as were others in areas where these cleaning products were used. As a result, the program developed outreach materials on working with cleaning materials. Safety tip cards were

developed to convey key messages in English, Spanish and through pictures and were distributed to the lodging industry, made available to partners, on the NYSDOH website and through our distribution center.

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 food processing, welding, surface mining, recycling, and beauty salons.

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 Work-related Asthma (WRA) 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 WRA 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 WRA, physicians often do not report. To identify and obtain information on WRA, it is important to identify and obtain access to many data sources including hospital discharge, ED, workers' compensation (WC), and poison control center data.

- 2) Physician outreach on reporting requirement did not increase physician reporting. Physician reports composed less than five percent of the WRA being reported to the program. 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 WRA Program found that cleaning materials accounted 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) Health educators and non-physician healthcare providers were more frequent viewers of a webcast on WRA recognition and diagnosis than physicians.

Non-physician health care providers (37%) and health educators (24%) were more frequent viewers of our webcast on WRA recognition and diagnosis than physicians (8%).

- 5) Over 40 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.

- 6) Partnerships were an integral part of accomplishing the activities with the WRA program and were most successful if they were initially formed with a specific goal.

Partnerships were 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 WRA. These sources were used to substantially increase WRA case identification in NYS.

- 2) Dedicating resources with the sole purpose of increasing physician reporting of WRA to state health departments is not a practical use of limited resources. Concentration on other methods of case ascertainment is prudent.
- 3) Information on cleaning materials being a common source of WRA can be used to develop outreach and education materials for occupations and industries that have potential exposure to these products. In NYS, it was used to drive the development of cleaning safety tip cards that were distributed to the lodging industry.
- 4) Health educators and non-physician healthcare providers 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.
- 5) To help others determine the prevalence of WRA in their state, the NYS WRA Program headed the development of an occupational health indicator that can be used to describe the burden of WRA. In NYS, the data was used to develop a Data to Action Report on WRA, a short communication designed to provide relevant WRA facts to mobilize public health action.
- 6) Finding common ground with a mid-level person in an organization can help lay the foundation for future partnerships as the person becomes a champion for your cause within their organization.

#### Intermediate Outcomes:

- The use of different data sources resulted in the identification of 1,228 cases of WRA, 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).
- The cleaning tip cards were distributed to over 2,500 lodging establishments in NYS.
- The Data to Action Report on WRA was distributed to over 200 individuals including the Regional Asthma Coalitions, the Asthma Partnership of NY Steering Committee, the Eliminating Disparities in Asthma project workgroup, and CDC and NIOSH partners.
- At least 18 states have used the WRA indicator to calculate the burden of WRA.
- A webcast on the recognition and diagnosis of WRA was developed and viewed by over 900 participants and continues to be available. Continuing education credits were available to physicians, nurses, and health educators. The American Academy of Allergy, Asthma & Immunology also approved it for placement within its online CME program.
- The *"Is Your Asthma Work-related?"* brochure was translated into Spanish. More than 16,000 copies have been distributed in English and Spanish.
- More than 800 health care groups in NYS received information on WRA, including the *"Is Your Asthma Work-related?"* brochure for distribution at their facilities.
- Educational materials on WRA were provided to over 1,000 workers who received training for asbestos abatement. These workers included those conducting asbestos abatement and in fields such as construction, plumbing, and maintenance.
- A health hazard alert on hair straightening products and formaldehyde was developed and distributed to over 100,000 cosmetologists in NYS.
- A partnership with Workers' Compensation Board on WRA case ascertainment led to collaboration on a grant proposal to develop a WC surveillance system.

## Final Scientific Report – Work-Related Asthma Program

### Background

Over the past decade, WRA has become the most common occupational lung disease in many countries.<sup>22,23</sup> It is a potentially preventable condition affecting an estimated 1.5 million people in the United States alone and includes both work aggravation of preexisting asthma and new-onset asthma induced by work exposures.<sup>24</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>25</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 that approximately 15 percent of adult asthma cases have an occupational component.<sup>2,26</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 has ranged from seven percent to 51 percent.<sup>27</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>28</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 percent depending on the survey and how the work-relatedness questions were asked.<sup>29</sup> Differences 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 as well as 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>30,31</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>5,32</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>32</sup> However, studies have shown that it can take years before a link is

made between a person's asthma and the workplace.<sup>33,34,35</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>29,36</sup> Moreover, 25 percent of adults with WRA will become unemployed and 44 percent will have to change jobs.<sup>37,38</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>29,39</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.

WRA has important long term health and economic consequences but can be resolved completely with timely control of exposures. While WRA can be prevented with appropriate engineering controls, safety procedures and use of PPE, successful prevention efforts depend on sufficient information to identify unhealthy workplaces and at-risk workers. Surveillance of WRA plays an important role in providing this needed information and can be used to identify workplace triggers, industries, and occupations in which workplace exposures occur.

NIOSH has recognized that state-based surveillance can play a critical role in the prevention of occupational lung diseases.<sup>40</sup> Laws mandating the reporting of occupational illnesses and injuries enable states to collect data, and partnerships with other state agencies and programs allow access to a number of different data sources. States are also in a unique position to identify opportunities for intervention and prevention and coordinate prevention activities with relevant partners. States can also serve as a liaison between companies and other state (e.g., State-Public Employee Safety & Health), local (e.g., county health departments) and federal agencies (e.g., Federal-OSHA, NIOSH). These links will help identify and target interventions to those occupations and industries with the highest risks.

### Specific Aims

**Aim 1.** Maintain and enhance case ascertainment and reporting of WRA by increasing knowledge of the Occupational Lung Disease Registry (OLDR).

### *Methodology*

Recognizing that physicians often do not report to disease registries, BOHIP not only strived to enhance physician reporting but undertook an initiative to obtain data through secondary sources. Data sources used to identify and obtain information on WRA cases included:

- **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.

- Hospital discharge and ED visit data: The New York Statewide Planning and Research Cooperative System (SPARCS) is a comprehensive all payer data reporting system. SPARCS currently collects patient level detail on patient characteristics, diagnoses and treatments, services, and charges for each hospital inpatient stay and outpatient (ambulatory surgery, ED, and outpatient services) visit. SPARCS data is collected and maintained within NYSDOH. Data from the system was identified based on specified ICD-9 codes and workers' compensation as a payment source. Medical records were reviewed to determine that the visit involved a diagnosis of asthma and an association with work. Additional information was obtained through patient interviews.
- NYS Occupational Health Clinic Network (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 an asthma 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: In NYS, an application known as eCase allows approved users to view the electronic case folders used by the WCB to process claims for injured workers. These electronic case folders contain all case information, party of interest contact information, and documents related to the case, including all forms, reports, and medical records submitted to WCB pertaining to the claim. It often contains an account of the circumstances surrounding the claim directly from the claimant since NYS requires the claimant to submit an employee claim of illness or injury. The claims number for cases involving lung disease were supplied by the WCB, the medical records and supporting information was reviewed in eCase, and additional information was obtained through patient interviews.
- Poison Control Centers (PCCs): There are two PCCs in NYS, the New York City PCC and the Upstate New York PCC. While the data does not include diagnosis, potential WRA cases were identified based on symptoms listed. Follow-up with the PCC was conducted to determine if there was record of a health care provider. If possible, health care providers were contacted to determine a diagnosis of asthma and association with work. Additional information was obtained through patient interviews.

## *Results*

### Physician and Health Facility Reporting:

- A toll-free reporting line was developed to allow physicians' offices and hospitals to call in patient information.
- A physician reporting form was made available and reports were received via fax and 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 worked with the SPARCS program to improve timely access to ED and hospital discharge data for case ascertainment.
- ED and hospital discharge data were used to identify potential cases of WRA.
- 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 entered into a Memorandum of Understanding with the WCB that allowed access to 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:

- BOHIP entered into a Memorandum of Understanding with the PCCs in NYS to utilize the PCC data for surveillance purposes.
  - We received access to the National Poison Data System for New York data, a real-time surveillance source that can be used to identify possible WRA cases.
  - On a quarterly basis, we received copies of all occupational calls to the Upstate New York Poison Center. The identifying information allowed for follow-up with health care providers and the cases.
- Information on our case ascertainment data sources was provided to NIOSH for use in a WRA surveillance how-to-guide.
  - Data on 537 WRA cases from 2009-2011 was submitted to NIOSH. This data was 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.
  - There have been 1,228 cases of WRA identified since the onset of the project.

*Discussion/Conclusions*

Physician reporting of WRA cases continued to be a challenge during the project period. While physicians were responsive to direct requests for additional information on a

patient, very few physicians spontaneously reported a WRA case that was not already identified within the system by another data source. When building a surveillance system for WRA, it was important to consider and establish methods to obtain information from secondary data sources. While the OHCN was the least labor intensive source of WRA cases, it is unique to NYS. The other data sources had their own unique challenges. Since there was no ICD-9 (or ICD-10) code that designates WRA in the hospital discharge or ED data, a primary diagnosis of asthma and a designation of workers' compensation as a pay (or expected pay) source was expected to identify WRA cases. However, upon review of the medical record, many of these cases involved a visit that did not involve WRA. Thus review of the medical record was a necessary step to confirm cases. Workers' compensation data also did not have a code that indicated that the claim involved WRA. Potential cases were identified via part of body (lung) and all the records were reviewed to identify WRA cases. Many PCC data systems (e.g., National Poison Data System) did not have identifying information. To successfully use PCC data for surveillance, it was important to establish a close working relationship with the PCCs. As mentioned previously, follow-up with the PCCs was necessary to determine if identifying information was available to enable further follow-up with the healthcare provider and patient. Because many physicians did not report cases of WRA, surveillance for WRA using secondary data sources was an arduous process involving multiple steps to determine if there was a health care diagnosis of asthma and an association with work.

***Aim 2.*** Utilize registry reports and surveillance data to guide public health interventions; help prevent ongoing or future exposures by recommending best work practices in identified high-risk occupations and industries; and protect other workers and members of the public who may be at risk.

### *Methodology*

All cases of WRA reported to the OLDR were assigned for telephone interview. Prior to calling the patient, a letter describing why we were contacting them, the brochure "*Is Your Asthma Work-related?*", and recommendations to talk to their doctor about their asthma triggers were mailed. Multiple attempts to contact the person were made at various times during the day. Information was collected on WRA through our acute lung disease questionnaire which collects information on the person's work history, exposures, and medical history. BOHIP had a Spanish speaking interviewer on staff to assist when needed. While BOHIP had access to individuals who are fluent in a multitude of languages and dialects, their assistance was not needed during the project period. Besides collecting information on the patient and the circumstances of exposure, the interview was used to provide education to the patient about methods to limit exposure, and appropriate prevention materials, if available, were sent to the individual. Industrial hygiene staff were also available to answer questions, if needed, and cases were given the option to discuss their exposures and concerns with one. 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.

Development of a computer-assisted interview was explored; however, input from staff who conducted the interviews indicated that use of this type of system may hinder recording of information. The interview sometimes lasted approximately 20 minutes to gather all the necessary information. Often during the interview process, the case provided information to questions not yet asked. It was determined that a computer-based interview would make it difficult for the interviewer to record this information when it is initially shared and asking for the information again when the question is reached on the computer-assisted interview would impede the process and the cooperation of the respondent.

All WRA 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. IH services were also provided to companies and individuals contacting BOHIP for assistance. Staff also explored aggregate data and scientific literature to identify areas to target outreach initiatives.

### *Results/Accomplishments*

BOHIP staff collaborated on NYSDOH's response to formaldehyde exposure associated with hair straightening products and worked with other state health departments, other NYS agencies, and federal partners including OSHA and NIOSH to better characterize formaldehyde exposure levels to salon workers and patrons and to develop mitigation options.

- BOHIP developed and issued two health hazard alerts regarding hair straightening products and formaldehyde; one for workers and one for consumers. In response, BOHIP received calls from stylists and consumers in the United States and around the world, including the United Kingdom, Ireland, South Africa and Canada.
- Through a partnership with the NY Department of State, Division of Licensing Services, the NYSDOH health hazard alerts on hair straightening products and formaldehyde were distributed to cosmetologists when they renewed their cosmetology license. In NYS, cosmetology licenses must be renewed every 2 years. Over 100,000 cosmetologists received the health hazard alert. The alerts were also made available on both the NYSDOH and the NY Department of State web sites.
- IH staff provided consultation to beauty salon owners and workers who experienced respiratory symptoms related to formaldehyde exposures from the application of keratin-based hair smoothing products. Referrals were made to the OHCN.
- IH staff drafted a letter that the NYSDOH Commissioner sent to the US Food and Drug Administration urging action on these products.

- In 2011, BOHIP was contacted by a local hospital to consult on a patient who was having acute respiratory failure. At the time the cause was unknown, but IH staff interviewed family members and determined that the patient's illness may have been a result of workplace exposures as a food inspector in a chicken processing plant. The patient died the next day. NYSDOH notified OSHA and NIOSH, as well as the local health department, and assisted with the conduction and coordination of foreign language interviews with potentially undocumented workers from the plant. An OSHA inspection of the facility was conducted. OSHA cited the plant for a variety of safety and health hazards, including failure to provide employees with information and training about the hazards of products that contain peracetic acid and bleach, as required by OSHA's hazard communication standard. The company contested its citations but an administrative law judge upheld the citation in 2014.

IH 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. An IH 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. Sites included:

- an international snack food processing facility (There were concerns over bronchiolitis obliterans and flavorings use at the plant. NIOSH was contacted to assist and a Health Hazard Evaluation was conducted.);
- aluminum welding processes at a swimming pool parts manufacturer;
- surface mine and aggregate processing facility;
- beauty salons;
- schools (walkthroughs that identified potential exposures to asthmagens);
- auto and scrap metal recycling;
- electronic recyclers;
- restaurants.

Surveillance data has linked cleaning products with WRA, and staff in the lodging industry were identified as an at-risk cohort. Staff assessed the needs of lodging establishments and created outreach materials to address safety issues encountered by workers who work with cleaning chemicals.

- To learn about cleaning product use and to determine interest in educational materials on WRA and cleaning products the following activities were conducted:
  - A survey on cleaning products and asthma was distributed to bed and breakfasts located throughout NYS.
  - A presentation to the NYS Hospitality and Tourism Board was made to gain an understanding of the needs of the hospitality industry.
  - Phone interviews were conducted with a number of hotels to learn what materials, formats and styles would be best suited to provide education to their cleaners.
  - Input was received from a major supplier of cleaning products to the hospitality industry. Information obtained included prevalent forms of cleaning products,

dilution methods, and affirmation that materials for a non-English speaking audience were needed.

- Safety tip cards were developed to be used by staff who work with cleaning chemicals. The four messages were: 1) Do not mix chemicals; 2) Avoid breathing sprays; 3) Follow directions; 4) Wear gloves, goggles and masks. The messages were conveyed in both English and Spanish, as well as through a graphic image as literacy in any language could not be assumed for this worker population.
  - These safety tip cards were distributed to over 2,500 permitted lodging establishments in NYS along with a list of resources on green cleaning and information on safe work practices. It was encouraged that the messaging be integrated with other instructional materials and the safety tips be displayed in areas where workers handle cleaning materials. The cards were designed to be easily hung on cleaning carts and rings to clip them onto the carts were provided.
  - The safety cards were made available on the NYSDOH website as well as through the NYS distribution center. The images from the cards are available for use in other outreach materials.

Surveillance data showed that a trigger for WRA was poor air quality. BOHIP began collaborative work on new green tracer gas technologies to assess building ventilation effectiveness and its impact on indoor air quality.

BOHIP staff participated in task forces that assessed the exposures of workers that could impact respiratory health including:

- Health effects of toll plaza air quality;
- Nail salons.

BOHIP collaborated with the New York Center for Agricultural Medicine and Health (NYCAMH) to provide respiratory protection training, medical clearance, and fit testing to farmworkers and farm owners, in both English and Spanish. There were 93 farmworkers and farm owners trained on proper respirator protection, and 59 were professionally fit-tested either at their farm or the local farm worker community center. Appropriate PPE is a component of the EPA Worker Protection Standard. Respirator masks and other PPE, including gloves, goggles, boots, etc., can protect against hazards and significantly reduce the risk of illness or injury.

BOHIP identified three potential WRA/respiratory fatalities. Staff consulted on these fatalities, and made referrals to various local, state, and federal agencies for further investigation and follow-up. These included:

- A food inspector in a chicken processing plant;
- A cement mason applying a sealer to a stone monument (determined not to be WRA);
- An equipment operator within a commercial bakery (determined not to be work-related).

Information from the New Jersey Department of Health's Health Alert Bulletin "*Fogging Ambulances with Toxic Disinfectants May Cause Illness*" was provided to the NYSDOH Bureau of Emergency Medical Services for distribution. A survey of 150 ambulatory service providers was unable to identify any ambulance fogging practices in NYS.

#### *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, 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 3.** Improve recognition and diagnosis of WRA among physicians.

#### *Methodology*

Because a successful physician-based surveillance system is contingent upon physicians being able to recognize a work-related condition, BOHIP conducted physician outreach and education regarding WRA.

The secondary data sources (Aim 1) were used to identify physicians who may have been in attendance of a case of WRA. 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, including WRA, was also provided to all hospitals in NYS.

BOHIP identified managed care organizations and medical societies that were potential outlets for newsletter articles. Three articles, *Could Your Patient Have Work-related Asthma?*, *Diagnosis of Occupational Diseases*, and *Could Your Asthma Be Work-related?* were written and provided to the organizations for inclusion within their newsletters.

Prior work had recommended the use of a continuing medical education course to raise awareness about WRA. Partnering with the Center for Public Health Continuing Education, the WRA Program developed a Public Health Live webcast on the recognition and diagnosis of WRA. Public Health Live is a monthly webcast series designed to provide continuing education opportunities on public health issues. BOHIP worked with key partners to develop a comprehensive program. The webcast featured a pulmonologist from the OHCN, who discussed how to recognize and diagnosis WRA in a patient; the Director of the NYSDOH Center for Environmental Health who discussed the partnership between the

physician and the health department on managing WRA in a patient; and an industrial hygienist with the NYSDOH Industrial Hygiene Consultation Services who offered information about services to help identify, evaluate and control hazards in the workplace. Continuing education credits were made available for not only physicians, but also for nurses, and health educators. As part of the continuing education program, information was collected on their perception of the CME and whether it contributed to their knowledge.

BOHIP utilized the OHCN to raise awareness of WRA. The expertise of a network physician was utilized in the Public Health Live. BOHIP meets quarterly with the OHCN, and also communicates via list serves and the SharePoint site. Whenever applicable, WRA activities and products were shared with the OHCN, with requests that these items also be shared with their advisory boards.

Prior outreach efforts had yielded information that Community Health Centers were unwilling to diagnose work-related diseases because they did not know how to treat and/or manage such patients. We attempted to address these barriers by raising awareness of the OHCN and WRA among community health centers. The OHCN can offer consultation to primary care physicians about diagnostic and treatment issues and are accustomed to dealing with the Workers' Compensation system. Moreover, because the clinics offer a sliding fee-scale, they can accept referrals from community physicians. The NYS OHCN can improve the quality of care, provide better treatment and disease management if a condition is work-related, offer advice about how to prevent future exposures, and use their IH services to potentially prevent similar exposures in the same work environment.

By working with our State Asthma Plan, we successfully added guidance to "*The Clinical Guideline for the Diagnosis, Evaluation and Management of Adults and Children with Asthma*"<sup>41</sup> about assessment of the patient's work environment for potential exposures that may aggravate asthma. The Guideline also stated that physicians should report cases of WRA and other occupational lung diseases to the OLDR. Efforts to incorporate additional guidance in accordance with the American College of Chest Physicians Consensus Statement on the Diagnosis and Management of Work-Related Asthma were not successful.

We had proposed to make presentations regarding WRA, the OLDR, and prevention activities associated with WRA 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, a physician from the OHCN has 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 WRA were sent information about the OLDR and reporting requirements.
- Information about reporting occupational lung disease cases, including WRA, was provided to all hospitals in NYS. The outreach included 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.
- Partnering with the Center for Public Health Continuing Education, the WRA Program developed a Public Health Live webcast on the recognition and diagnosis of WRA. Continuing Education credits are available for physician, nurses, and health educators.
  - The announcement of the webcast was provided to a number of partners who were asked to further disseminate the announcement, reaching thousands of potential participants.
  - The Public Health Live on WRA was evaluated and received an overall rating of 4.5 (scale of 1 - strongly disagree to 5 - strongly agree) with viewers agreeing that they are now able to describe the symptom patterns suggestive of WRA, perform the appropriate diagnostic evaluation, and list common triggers associated with WRA. Viewers also agreed that they are committed to applying newly acquired knowledge, skills or strategies to change or enhance their practice. The webcast was far reaching, with two-thirds of the viewers outside of NYS. Health educators (23%) and nurses (25%) were the most frequent viewers, emphasizing the need to target future outreach to these groups. Only eight percent of the viewers were physicians. Many of the participants identified themselves as working for a government agency or categorized themselves as “Other”.
  - The Public Health Live webcast continues to be available on the Center for Public Health Continuing Education website. This Center is part of the University at Albany, State University of New York.
  - The American Academy of Allergy, Asthma & Immunology, a professional organization with more than 6,800 members, reviewed our Public Health Live webcast “*Work-related Asthma: Recognition and Diagnosis*”, and approved it for placement within the AAAAI online CME program.
- More than 800 health care groups in NYS received information on WRA and the OHCN. They also received copies of the *Is Your Asthma Work-related* brochure for distribution at their facilities.
- Three articles, *Could your patient have work-related asthma?*, *Diagnosis of occupational diseases* and *Could your asthma be work-related?* were sent to 42 medical societies and 20 health care organizations for inclusion in their newsletters.
- Information on WRA and reporting to the OLDR were incorporated into the Clinical Guideline for the Diagnosis, Evaluation and Management of Adults and Children with Asthma.

### *Discussion/Conclusions*

While outreach to physicians did not result in an increase in physician-initiated reports to the OLDR, the endeavor was still important in raising awareness of WRA among physicians. 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.

Through our efforts we have learned that health care providers other than physicians, may be more receptive to outreach on the recognition and diagnosis of WRA. Both asthma educators and nurses viewed the Public Health Live webcast on WRA more frequently than physicians. Efforts are being developed to focus future outreach to these populations.

**Aim 4.** Develop educational material and outreach strategies to increase the recognition and awareness of WRA among adults with asthma.

### *Methodology*

The NYSDOH's "*Is York Asthma Work-related*" brochure was 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 was also translated into Spanish.

The WRA program collaborated with the NYS Asthma Program in the development and distribution of asthma-related material that would assist patients in identifying their triggers as well as talking with their physician about their asthma.

Through utilization of the NIOSH developed State-based Occupational Health Surveillance Clearinghouse web application, we inventoried existing WRA prevention material available from other states, and we also identified information available from other sources such as OSHA.

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*

- The WRA program collaborated with the NYS Asthma Program in the development of "*Asthma Trigger Tracker and Key Questions: Tools for Your Next Asthma Check-up.*"
- The Occupational Lung Disease website was updated to include a page specifically for workers, where they can get answers to common questions and access available resources.
- The "*Is Your Asthma Work-related?*" brochure was translated into Spanish.
- During the project period, over 13,000 English copies and 3,000 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.
- WRA information, including the availability of the "*Is Your Asthma Work-related*" brochure and "*Asthma Trigger Tracker and Key Questions: Tools for Your Next Asthma*

*Check-up.*”, was included in outreach mailings. Targets of this outreach campaign included:

- Regional Asthma Coalitions
- Asthma Partnership of New York Steering Committee Members
- Health plans and hospitals participating in the NYC Eliminating Disparities in Asthma Care initiative
- Partners in the Healthy Neighborhoods Programs
- Community Health Centers.
- Partnering with the Occupational and Environmental Health Center of Eastern New York, over 200 “*Is Your Asthma Work-related?*” brochures were distributed at health fairs and educational events.
- Through a partnership with the NYSDOH Asbestos Safety Training Program, educational materials on WRA, as well as smoking cessation, were provided to over a 1,000 workers who received 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 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.

#### *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.

**Aim 5.** Strengthen and expand partnerships and collaborations with governmental agencies, non-governmental organizations, industry groups, unions and trade associations to improve the effectiveness and impact of the WRA program.

#### *Methodology*

Identification and utilization of partnerships were critical for a successful surveillance program. They were used in all aspects of the WRA program from case ascertainment, product development, and outreach and dissemination.

#### *Results*

- BOHIP has been actively involved in the NYSDOH cross-organizational response to asthma which applied a systematic evidence-based approach in surveillance, environmental and occupational health, health care delivery and quality, and community interventions. This approach is organized around three operational levels: 1) Executive Leadership Team, 2) Guidance Team, and 3) Core Teams. Staff from BOHIP sits on all three of these teams.

- BOHIP has used the Asthma Program list serve to reach hundreds of stakeholders interested in asthma topics.
- Staff worked with the State Asthma Plan to incorporate WRA into its work.
- Staff participated in the annual NIOSH/State WRA Surveillance meetings and collaborated with other state and national partners conducting surveillance of WRA.
- We are an active member of the Asthma Call Back Survey Workgroup.
- We partnered with the Workers' Compensation Board, the NYC and Upstate New York PCCS, and the Bureau of Health Informatics to obtain data for WRA surveillance.
- Collaborations with NIOSH and OSHA occurred during several investigations.
- We partnered with the Center for Public Health Continuing Education in the development of the Public Health Live webcast and continuing education opportunity.
- Partnerships with the NYS Hospitality and Tourism Board, the Empire Bed and Breakfast Association, hotels, and other Bureaus within NYSDOH allowed us to be successful in the creation of the cleaning tip cards for the lodging industry.
- A close working relationship with the OHCN has allowed us to utilize their services to identify cases, distribute materials, and provide expertise regarding WRA.
- Through a partnership with the NY Department of State, Division of Licensing Services, the NYSDOH health hazard alerts on hair straightening products and formaldehyde were distributed to over 100,000 cosmetologists.
- By partnering with NYCAMH, we were able to reach a farm worker population about respiratory protection that we never would have reached.

### *Discussion/Conclusions*

Partnerships are an integral part of a successful surveillance program. They played a role in all aspects of program activities including case ascertainment, providing medical knowledge and services, assisting with the development of outreach materials and providing mechanism for distribution. Their expertise assisted with identifying needs, problems and solutions.

**Aim 6.** Utilize data sources to promote research and to produce and disseminate information that characterizes WRA in NYS.

### *Methodology*

Various data sources were used to characterize WRA in NYS. Information produced from these analyses were reported via publications, surveillance reports, presentations, and the NYSDOH website. We utilized our expertise in obtaining population-based estimates of the proportion of adult asthmatics with WRA to assist others in their use of the data.

### *Results*

- Behavioral Risk Factor Surveillance System Survey (BRFSS) is the world's largest, on-going telephone health survey system, tracking health conditions and risk behaviors in the United States. The Asthma Call-back Survey (ACBS) is an in-depth asthma survey conducted with BRFSS respondents who report an asthma diagnosis. NYS used both these surveys to collect statistics on WRA. Because of our expertise and experience with the data, BOHIP was actively involved on a committee to evaluate and revise the

questions, and helped produce a User Manual to guide analysis and interpretation of the data.

- To help other states determine the prevalence of WRA in their state, staff led the development of a new occupational health indicator. 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. The WRA OHI was added to “*Occupational Health Indicators: A Guide for Tracking Occupational Health Conditions and Their Determinants*” that was updated in March 2014. NYS served as the lead for this OHI and has assisted States with their calculation of the indicator, including a presentation at the 2014 CSTE Annual meeting that provided states results so states could make a comparison when calculating the WRA OHI for the first time.
- Working with the NYSDOH Asthma Program, a Data to Action Report on WRA was developed as a short communication designed to provide relevant WRA facts to mobilize public health action. The report included a take home message, quick facts describing the problem, resources available in diagnosing and treating WRA and preventing exposures, and statements describing opportunities and suggested actions. Data used in the report came from the BRFSS Asthma Call-Back Survey and the Association of Occupational and Environmental Clinics database. The WRA Data to Action Report was one of four reports developed to convey information on asthma; the other three reports available are Asthma Self-Management Education, Asthma Medication Use, and Asthma and the Indoor Environment. The Asthma Data to Action reports were distributed internally to the NYSDOH Asthma Guidance Team and externally to over 200 individuals including the Regional Asthma Coalitions and their site-based project teams, the Asthma Partnership of NY Steering Committee, the Eliminating Disparities in Asthma project workgroup, and CDC and NIOSH partners. Recipients were asked to further disseminate the reports.
- WRA information was provided for the NYS Asthma Surveillance Summary Report, a NYSDOH publication that includes a chapter on WRA. The aim of the report was to help public health programs, policy makers and health care providers recognize the scope of the problem and to engage partners to help reduce the burden of asthma in NYS.
- To provide surveillance information and access to data for public health action, the program provided WRA data to NIOSH for use in an on-line Work-Related Lung Disease Surveillance System (eWoRLD).

*Discussion/Conclusion:*

The development of the WRA OHI indicator has given each state that conducted the Asthma Call Back Survey the foundation to begin to describe WRA in their state and introduced them to the Asthma Call Back Survey that can be further analyzed to help guide priorities for prevention and intervention.

The Data to Action Report on WRA was developed as a short communication designed to provide relevant WRA facts to mobilize public health action in NYS. Stakeholders can use one-page report to quickly and easily describe the problem and the role of person with asthma, the doctor, and the employer in WRA identification, treatment, and prevention. It’s a product that can be easily adapted for use by other states.

The publication and dissemination of surveillance data, and sharing of expertise and knowledge, is important to further external surveillance and research needs.

***Aim 7.*** Assess training/educational needs and develop appropriate materials and systems for disseminating consistent and sector-appropriate information about green cleaning.

Due to a reduction in the award amount and the change in priority of the NYS Asthma Plan, it was no longer feasible to collaborate with the NYS Asthma Plan in developing sector-specific messages and tools for green cleaning. CDC/NIOSH was notified of this change in the Year 1 Progress Report.

### *Results*

- We continued to link to New York's Cleaning Program website, as well as other green cleaning information, through our Occupational Lung Disease website.
- Information on green cleaning resources was incorporated into the outreach to lodging facilities.
- The NYSDOH provided comments on the Ecologo CCD-146 Hard Surface Cleaners Standard, supporting the prohibition of asthmagens in the revised standard and using the AOEC asthmagen list as the exclusion criteria.

### Occupational Injury Prevention Products Developed by NYS WRA Program

#### ***Presentations***

- "*Occupational Lung Disease Registry*", NYS OHCN, Troy NY, September 2010.
- "*Cleaning Products and Asthma: Education and Information for the Hospitality Industry*" Council of State and Territorial Epidemiologist annual conference, Pasadena CA, June 2013.
- "*Cleaning Products and Work-related Asthma*", NYS Hospitality and Tourism Board meeting, Syracuse NY, February 2013.
- "*Reporting Work-related Asthma to the Occupational Lung Disease Registry*" NYS OHCN, Rensselaer NY, December 2013.
- "*Disseminating the Public Health Live on Recognition and Diagnosis of Work-related Asthma*" NYS OHCN, Rensselaer NY, June 2014.
- "*Asthma Caused or Made Worse by Work: A Look at the Newly Proposed Occupational Health Indicator*", Council of State and Territorial Epidemiologist annual conference, Nashville TN, June 2014.
- "*Work-related Asthma Surveillance: New York State Update*", 2014 NIOSH/State Occupational Lung Disease Surveillance meeting, Atlanta GA, March 2014.
- "*Silicosis Surveillance: New York State Update*", 2014 NIOSH/State Occupational Lung Disease Surveillance meeting, Atlanta GA, March 2014.
- "*OHI on Pneumoconiosis*", 2014 NIOSH/State Occupational Lung Disease Surveillance Meeting, Atlanta GA, March 2014.

### **Publications**

- Gelberg KH, Brissette IF, Cummings KR. Evaluation of a Communications Campaign to Increase Physician Reporting to a Surveillance System. *Public Health Reports* 2011;126:19-27.
- “Diagnosis of Occupational Diseases” was published on the New York County Medical Society website.
- “Could Your Patient Have Work-Related Asthma” was published on the New York County Medical Society website.
- “Cleaning Products and Asthma” was published in the Empire Bed and Breakfast Association (ESBBA) member newsletter.

### **Other Output**

- Health Alert for Beauty Salon Owners and Workers: Hair Straightening Products and Formaldehyde.  
<http://www.health.ny.gov/environmental/chemicals/formaldehyde/workers.htm>. [Accessed September 10, 2015]
- Consumer Health Alert: Hair Straightening Products and Formaldehyde  
<http://www.health.ny.gov/environmental/chemicals/formaldehyde/consumer.htm> [Accessed September 10, 2015]
- Work-Related Asthma: Recognition and Diagnosis  
[http://www.albany.edu/sph/cphce/phl\\_0614.shtml](http://www.albany.edu/sph/cphce/phl_0614.shtml) [Accessed September 21, 2015]
- “Asthma Trigger Tracker and Key Questions: Tools for Your Next Asthma Check-up.”  
[http://www.health.ny.gov/publications/4990/asthma\\_triggers\\_tracking.pdf](http://www.health.ny.gov/publications/4990/asthma_triggers_tracking.pdf) [Accessed September 21, 2015]
- “Is Your Asthma Work-related?” <https://www.health.ny.gov/publications/2775.pdf> (English) <https://www.health.ny.gov/publications/2832.pdf> (Spanish) [Accessed September 22, 2015]
- Data to Action Report on WRA  
[https://www.health.ny.gov/statistics/ny\\_asthma/pdf/adta\\_wra.pdf](https://www.health.ny.gov/statistics/ny_asthma/pdf/adta_wra.pdf) [Accessed September 22, 2015]
- NYS Asthma Surveillance Summary Report  
[https://www.health.ny.gov/statistics/ny\\_asthma/pdf/2013\\_asthma\\_surveillance\\_summary\\_report.pdf](https://www.health.ny.gov/statistics/ny_asthma/pdf/2013_asthma_surveillance_summary_report.pdf) [Accessed September 22, 2015]
- Council of State and Territorial Epidemiologists. Occupational Health Indicators. Indicator 21: Asthma Among Adults Caused or Made Work by Work.  
<http://www.cste.org/?OHIndicators> [Accessed September 10, 2015]
- Safety tip cards on working with cleaning chemicals  
<https://www.health.ny.gov/publications/6507.pdf> [Accessed September 21, 2015]

## Cumulative Inclusion Enrollment Report

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

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

**Comments:**

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	3	3	0	0	0	0	0	0	0	6
Asian	8	5	0	0	0	0	2	1	0	16
Native Hawaiian or Other Pacific Islander	0	0	0	0	0	0	0	0	0	0
Black or African American	163	56	0	7	3	0	15	10	0	254
White	224	293	0	12	11	0	39	24	0	603
More Than One Race	3	2	0	3	7	0	4	1	0	20
Unknown or Not Reported	98	68	0	39	28	0	65	31	0	329
<b>Total</b>	<b>499</b>	<b>427</b>	<b>0</b>	<b>61</b>	<b>49</b>	<b>0</b>	<b>125</b>	<b>67</b>	<b>0</b>	<b>1,228</b>

## References

- <sup>1</sup> US Department of Labor. Survey of Injury and Illness. <http://www.bls.gov/iif/oshwc/osh/os/pr136ny.pdf> [Accessed September 30, 2015]
- <sup>2</sup> Leigh JP, Marcin JP, Miller TR. An estimate of the U.S. Government's undercount of nonfatal occupational injuries. *J Occup Environ Med.* 2004; 46:10-18.
- <sup>3</sup> US House of Representatives. *Hidden tragedy: Underreporting of workplace injuries and illnesses.* A Majority Staff Report by the Committee on Education and Labor. June 2008.
- <sup>4</sup> Leigh JP, Markowitz SB, Fahs M, et al. Occupational injury and illness in the United States: estimates of costs, morbidity, and mortality. *Arch Intern Med.* 1997; 157:1557-1568.
- <sup>5</sup> US Department of Health and Human Services, NIOSH Program Portfolio, Surveillance. [www.cdc.gov/niosh/programs/surv/goals.html](http://www.cdc.gov/niosh/programs/surv/goals.html) [Accessed September 30, 2015].
- <sup>6</sup> Azaroff LS, Levenstein C, Wegman DH. Occupational injury and illness surveillance: Conceptual filters explain underreporting. *Am J Public Health.* 2002; 92: 1421-1429.
- <sup>7</sup> Brissette I, Gelberg KH, Grey AJ. The effect of message type on physician compliance with disease reporting requirements. *Public Health Rep.* 2006; 121:703-709.
- <sup>8</sup> Council of State and Territorial Epidemiologists. Occupational Health: Indicators. <http://www.cste.org/group/OHIndicators> [Accessed September 30, 2015].
- <sup>9</sup> US Department of Health and Human Services, NIOSH. *Guidelines for Minimum and Comprehensive State-based Public Health Activities in Occupational Safety and Health.* 2008. DHHS (NIOSH) Publication No. 2008-148.
- <sup>10</sup> Cleere RL, Dougherty WJ, Fiumara NJ, Jenike C, Rose NJ. Physician attitudes toward venereal disease reporting. *J Am Med Assoc.* 1967; 202:117-122.
- <sup>11</sup> Konowitz PM, Petrossian GA, Rose DN. The underreporting of disease and physicians' knowledge of reporting requirements. *Public Health Rep.* 1984; 99:31-35.
- <sup>12</sup> Sexias NS, Rosenman KD. Voluntary reporting system for occupational disease: Pilot project, evaluation. *Public Health Rep.* 1986; 101:278-282.
- <sup>13</sup> Gelberg KH, Brissette I, Cummings R. Evaluation of a communications campaign to increase physician reporting to a surveillance system. *Public Health Rep.* 2011; 126:19-27.
- <sup>14</sup> US Department of Labor. Bureau of Labor Statistics. Current Population Survey. Geographic Profiles of Employment and Unemployment. 2007. [www.bls.gov/gps/](http://www.bls.gov/gps/) [Accessed August 26, 2015]
- <sup>15</sup> US Department of Labor. Occupational Safety and Health Administration. Plan, Provide, Train, Three simple steps to preventing falls. <https://www.osha.gov/stopfalls/> [Accessed August 27, 2015]
- <sup>16</sup> US Department of Labor. Bureau of Labor Statistics. Geographic Profile of Employment and Unemployment, 2012. <http://www.bls.gov/opub/gp/laugp.htm> [Accessed September 30, 2015].
- <sup>17</sup> Haddon W. Advances in the epidemiology of injuries as a basis for public policy. *Public Health Rep.* 1980;95:411-21.
- <sup>18</sup> US Department of Labor. Occupational Safety and Health Administration. Safety and Health Topics Agricultural Operations. <https://www.osha.gov/dsg/topics/agriculturaloperations/> [Accessed August 27, 2015]

- <sup>19</sup> US Department of Labor. Bureau of Labor Statistics. Highest rates for total cases - injuries and illnesses -2007. [www.bls.gov/iif/oshwc/osh/os/ostb1905.txt](http://www.bls.gov/iif/oshwc/osh/os/ostb1905.txt) [Accessed August 26, 2015]
- <sup>20</sup> Echobichon DJ. *Toxic effects of pesticides*. In Amdar M, Doull J, Klaassen C (eds.): Casarett and Doull's Toxicology. The Basic Science of Poisons. New York, McGraw-Hill, 1996, pp. 643-689.
- <sup>21</sup> Costa LG. *Basic toxicology of pesticides*. In Keifer MC (ed.): Human Health Effects of Pesticides. Occupational Medicine: State of the Art Reviews. Philadelphia, Hanley and Belfus, Inc., Vol. 12, No. 2, April-June 1997, pp. 251-268.
- <sup>22</sup> Blanc PD, Toren K. How much adult asthma can be attributed to occupational factors? *Am J Med*. 1999;107:580-587.
- <sup>23</sup> Balmes J, Becklake M, Blanc P, et al. American Thoracic Society Statement: Occupational contribution to the burden of airway disease. *Am J Respir Crit Care Med*. 2003;167:787-797.
- <sup>24</sup> Flattery J, Davis L, Rosenman KD, Harrison R, Lyon-Callo S, Filios M. The Proportion of Self-Reported Asthma Associated with Work in Three States: California, Massachusetts, and Michigan, 2001. *J Asthma*. 2006; 43:213-218.
- <sup>25</sup> Mapp CD. Agents, old and new, causing occupational asthma. *J Occup Environ Med*. 2001;58:354-360.
- <sup>26</sup> Tarlo SM, Balmes J, Balkissoon R, et al. Diagnosis and Management of Work-Related Asthma: American College of Chest Physicians Consensus Statement. *Chest*. 2008;134:1-41.
- <sup>27</sup> Toren K, Blanc PD. Asthma caused by occupational exposures is common - A systematic analysis of estimates of the population- attributable fraction. *BMC Pulmonary Medicine*. 2009;9:7.
- <sup>28</sup> Ezzati-Rice TM, Curtin LR. Population-based surveys and their role in public health. *Amer J Prev Med*. 2001;20(4):15-16.
- <sup>29</sup> Tice CJ, Cummings KR, Gelberg KH. Surveillance of Work-Related Asthma in New York State. *J Asthma*. 2010;47(3):310-316.
- <sup>30</sup> Shofer S, Haus BM, Kuschner WG. Quality of occupational history assessments in working age adults with newly diagnosed asthma. *Chest*. 2006;130:455-462.
- <sup>31</sup> Milton DK, Solomon GM, Rosiello RA, Herrick RF. Risk and incidence of asthma attributable to occupational exposure among HMO members. *Am J Ind Med*. 1998;33:1-10.
- <sup>32</sup> Friedman-Jiménez G, Beckett WS, Szeinuk J, Peterson EL. Clinical evaluation, management, and prevention of work-related asthma. *Am J Ind Med*. 2001;37:121-141.
- <sup>33</sup> Lemiere C, Forget A, Dufour M, et al. Characteristics and medical resource use of asthmatic subjects with and without work-related asthma. *J Allergy Clin Immunol*. 2007;120:1354-9.
- <sup>34</sup> Fishwick D, Bradshaw L, Davies J, et al. Are we failing workers with symptoms suggestive of occupational asthma? *Prim Care Resp J* 2007;16(5):304-310.
- <sup>35</sup> Ross DJ, McDonald JC. Health and employment after a diagnosis of occupational asthma: a descriptive study. *Occup Med*. 1998;48:219-225.
- <sup>36</sup> Cannon J, Cullinan P, Newman T. Consequences of occupational asthma. *BMJ*. 1995;311:602-603.
- <sup>37</sup> Ameille J, Pairon JC, Bayeux MC et al. Consequences of occupational asthma on employment and financial status: a follow-up study. *Eur Resp J*. 1997;10:55-58.

<sup>38</sup> Fletcher AM, London MA, Gelberg KH, Grey AJ. Characteristics of patients with work-related asthma seen in the New York State Occupational Health Clinics. *J Occup Environ Med.* 2006;48:1203-1211.

<sup>39</sup> Brenton CV, Zhang Z, Hunt PR, Pechter E, Davis L. Characteristics of work related asthma: results from a population based survey. *Occup Environ Med.* 2006;63:411-415.

<sup>40</sup> US Department of Health and Human Services. National Institute for Occupational Safety and Health. *Tracking occupational injuries, illness and hazards: the NIOSH Surveillance Strategic Plan.* DHHS (NIOSH) Publication No. 2002-116, 2002.

<sup>41</sup> New York State Department of Health. Clinic Guideline for the Diagnosis, Evaluation and Management of Adults and Children with Asthma.

<http://www.health.ny.gov/publications/4750.pdf> [Accessed September 18, 2015].