OCCUPATIONAL HEALTH INDICATORS REPORT, NEW YORK STATE, 2009-2019

Introduction

Since 2002, New York State (NYS) has been compiling the Occupational Health Indicators (OHIs) in collaboration with the Council of State and Territorial Epidemiologists (CSTE) and the National Institute for Occupational Safety and Health. The OHIs are a set of surveillance measures that allow states and territories to define, collect and report occupational illness, injury, and risk data. The following report describes the data collected from the first year of OHI collection, 2009, through 2019, the most recent year of compiled data.

Background

Every year on average, almost 3 million of the 135 million workers in the United States (US) are injured on the job or become ill resulting from exposure to health hazards at work. These work-related injuries and illnesses are preventable. Understanding the problem begins with having occupational health surveillance data available to determine the magnitude of work-related injuries and illnesses, identify workers at greatest risk, and establish prevention priorities.

Employment Profile:

The civilian labor force is defined as all persons 16 years of age and older, residing in NYS, who are not inmates of institutions or on active duty in the Armed Forces, who are employed or actively seeking employment.[1] In 2009, there were about 8.9 million individuals in New York State's (NYS) labor force. This number increased to 9.1 million in 2019. The rate of unemployment in 2019 was 4.0% which was a decrease from 8.3% in 2009. (Table A).

Industry and Occupation

NYS workers are engaged in diverse jobs and face very different risks, depending on their industries. It is important to understand the industrial makeup of a job market to better understand the health and safety challenges and risks facing the workforce. For example, workers in the battery manufacturing industry are primarily concerned about exposure to lead, while falls cause injuries and fatalities among construction workers. As shown in Table B, in 2009, 26.6% of workers were employed in the education and health industry, 12.5% employed in wholesale and retail trade, 10.3% in the professional and business industry, and 6.8% of workers were employed in the construction industry. In 2019, 27.5% of workers were employed in the education and health industry, followed by 13.3% employed in the professional and business services and 11% were employed in the wholesale and retail trade industry.

Table A. Worker Demographics and Employment Characteristics, Aged 16 and Older, NYS, 2009, 2019

Employment Characteristics	**2009**	**2019**
Number of Workers Employed	8,900,000	9,100,000
Employment Status	Percentage	Percentage
Unemployed	8.3	4.0
Self-employed	6.2	5.4
Part-time	17.4	16.9
Number of hours worked/week		
<40	38.4	32.5
40	41.0	46.0
41+	20.6	21.5
Sex		
Male	52.2	52.4
Female	47.8	47.7
Age		
16-17	0.9	0.8
18-64	94.6	91.8
65+	4.5	7.5
Race*		
White	76.8	72.4
Black	14.4	15.5
Other	8.8	12.1
Ethnicity**		
Hispanic or Latino	14.9	17.5

*Workers whose race is identified as White/Black/Other may be of any ethnicity. Included in the "Other" group are people classified as American Indian and Alaska Native (AIAN), as Native Hawaiian and other Pacific Islander (NHPI), as some other race (SOR), and within two or more race categories. Because of the relatively small sample size in most areas, data for "other" races are not published.
** This category refers to people who identified themselves as Mexican, Puerto Rican, Cuban, Central or South American, or of other Hispanic or Latino ethnicity or descent. People whose ethnicity is identified as Hispanic or Latino may be of any race.

Table B. Distribution of Workforce by Major Industry and Occupation Groups, NYS, 2009, 2019

Percentage of civilian employment by industry	**2009**	**2019**
Mining and logging	0.1	0.0
Construction	6.8	6.5
Manufacturing: Durable Goods	3.9	3.2
Manufacturing: Nondurable Goods	2.7	2.1
Wholesale and retail trade	12.5	11.0
Transportation and utilities	5.9	6.2
Information	2.7	2.6
Financial activities	8.1	8.4
Professional and business services	10.3	13.3
Education and health services	26.6	27.5
Leisure and hospitality	9.2	9.3
Other services	5.1	4.4
Public administration	5.7	4.8
Agriculture and related industries	0.5	0.8
Percentage of civilian employment by occupation		
Management, business, and financial operations	14.2	17.1
Professional and related occupations	23.4	26.1
Service	19.9	20.2
Sales and related occupations	11.3	9.0
Office and administrative support	13.1	10.6
Farming, fishing, and forestry	0.2	0.4
Construction and extraction	5.4	4.9
Installation, maintenance, and repair	3.0	2.5
Production	3.7	3.4
Transportation and material moving	5.9	6.0

References:

1. United States Bureau of Labor Statistics. Labor Force Statistics from the Current Population Survey. Concepts and Definitions. 2023. https://www.bls.gov/cps/definitions.htm#laborforce

Indicator 1: Work-Related Injuries and Illnesses

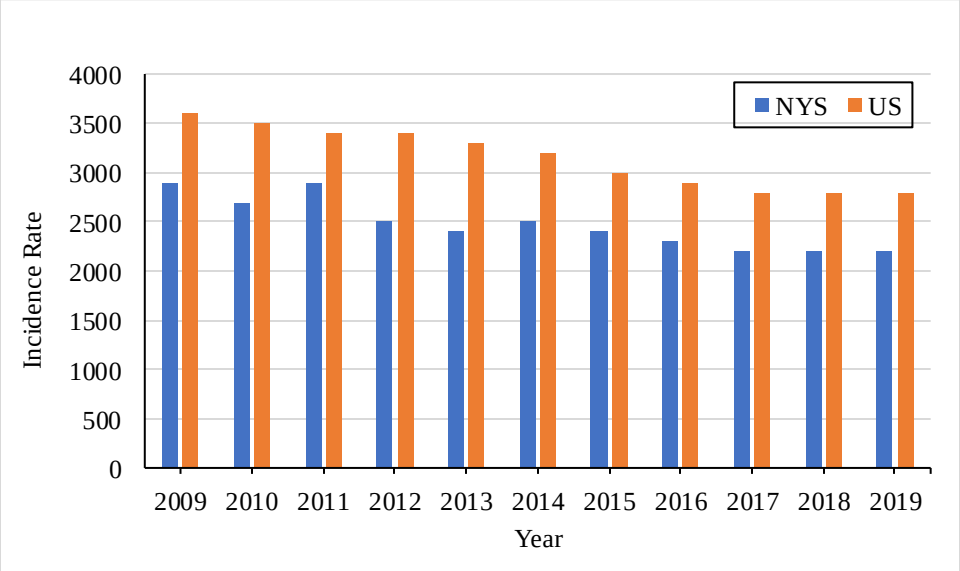
Work-related injuries are generally defined as injuries that result from single events such as falls, being struck, or crushed by objects, electric shocks, or assaults. Work-related illnesses, such as asthma, silicosis, and carpal tunnel syndrome, typically occur as the result of longer-term exposure to hazardous chemicals, physical hazards (e.g., radiation, noise), or repeated stress or strain at work. Infectious diseases also can be caused by workplace exposures. It is more difficult to track work-related illnesses than injuries because many of the conditions also can be caused by non-occupational factors. Many work-related illnesses take a long time to develop and may not appear until many years after the individuals have left employment.

Out of the 2.8 million work-related injuries in the US in 2019, 140,500 occurred among NYS workers aged 16 years and older. There was an overall decrease in the number of injuries for both NYS and US over time (Table 1). As shown in Figure 1, the incidence rate for all work-related injuries and illnesses per 100,000 full-time employed (FTE) NYS workers were highest in 2009 and 2011, and lowest in 2017. The rate decreased over time for NYS and US. The NYS rate remained lower than the US rate throughout the time-period as well.

Table 1. Annual Number of Work-Related Injuries and Illnesses Reported by Private Sector Employers, NYS, US, 2009-2019

Year	NYS	US
2009	160,000	3,277,700
2010	154,200	3,063,400
2011	162,900	3,034,500
2012	146,300	3,027,600
2013	143,400	3,007,300
2014	149,100	2,953,500
2015	148,000	2,905,900
2016	139,500	2,857,400
2017	138,600	2,811,500
2018	140,200	2,834,500
2019	140,500	2,814,000

Figure 1. Annual Non-Fatal Work-Related Injury and Illness Incidence Rate (per 100,000 FTEs) Reported by Private Sector Employers, NYS, US, 2009-2019



Data Sources: Bureau of Labor Statistics' (BLS) Annual Survey of Occupational Injuries and Illnesses (SOII)

References:

1. United States Bureau of Labor Statistics. Injuries, Illnesses, and Fatalities. IIF Latest Numbers. 2022 https://www.bls.gov/iif/latest-numbers.htm

Technical Notes:

- The SOII is based on a probability sample of employer establishments (https://www.bls.gov/iif/). As such, SOII estimates are subject to sampling error. For SOII, employers are required to follow Occupational Safety and Health Administration (OSHA) regulations for recording work-related cases of injuries and illnesses:
  – Include events that result in death, loss of consciousness, days away from work, restricted work, or medical treatment beyond first aid.
  – Record detailed case characteristics (e.g., nature, body part, event) are reported when the injury or illness results in at least one day away from work.
  – Approximately 14% of the workforce are not included (military, self-employed individuals, private household workers, workers on farms with 10 or fewer employees, and Federal agencies) as these worker groups fall outside the scope of the Occupational Safety and Health Act of 1970.
- Rates published by BLS are reported as the number of injury and illness cases per 100 full-time equivalents (FTEs). Rates presented in Figure 1 are reported as cases per 100,000 FTEs and were derived by multiplying BLS published rates by 1,000.

Limitations:

- The SOII estimates are subject to certain limitations-
  – Employers do not always record all relevant events.
  – Employers are often unaware of work-related conditions. This may include cases in which medical care from personal health care providers was sought, conditions with long latencies, and conditions that are diagnosed after an employee leaves an employer.
  – SOII data are based on year of incident and are collected shortly after the end of the calendar year. Thus, lost work-time cases that carry over to a new calendar year may not be captured.

Indicator 2: Work-Related Hospitalizations

Individuals hospitalized for work-related injuries and illnesses have some of the most serious and costly adverse work-related health conditions. It has been estimated that, nationwide, approximately 3% of workplace injuries and illnesses result in hospitalizations, and that hospital charges for work-related conditions exceed $3 billion annually.[1] Most identified work-related hospitalizations are for treatment of musculoskeletal disorders and acute injuries.[1] State hospital discharge data are useful for surveillance of serious health conditions. While these state data sets do not include explicit information about "work-relatedness" of the health conditions for which a patient is hospitalized, they do include information about the payer for the hospital stay. The designation of workers' compensation as primary payer is a good proxy for the work-relatedness of hospitalized injuries.[2] It is not a sensitive measure of work-related illness.

Hospitalizations were identified using the ICD-9-CM codes through 09/30/2015, followed by ICD-10-CM codes from 10/01/2015 and thereafter. 2015 hospitalization data used both ICD-9-CM and ICD-10-CM codes and this transition in classification of hospitalizations between ICD-9-CM and ICD-10-CM may not be a one-to-one match. Thus, we consider the transition from the ICD-9-CM to the ICD-10-CM a break-in series. Any comparisons prior to or for years after 2015 is not advised. There were 12,465 work-related hospitalizations reported among workers 16 years and older in NYS in 2019 (Table 2). US hospitalizations and rates were not collected. The crude rate for hospitalizations coded using ICD-9-CM was 166.4 in 2009 (Figure 2.1) and 149.5 in 2014. The crude rate for hospitalizations coded using ICD-10-CM, was 154.4 in 2016 and 137.0 in 2019 (Figure 2.2).

Table 2. Annual Number of Work-Related Hospitalizations of Persons Aged 16 years or Older, NYS, 2009-2019

YEAR	NYS
2009	14,831
2010	15,722
2011	14,696
2012	14,169
2013	13,676
2014	13,371
2015	*
2016	14,053
2017	14,720
2018	15,325
2019	12,465

*2015 is a break-in series due to transition in ICD coding and should not be compared to years prior to or after. US data was not collected.

Figure 2.1 Annual Crude Work-Related Hospitalization Rate (per 100,000 employed persons), NYS, 2009-2014

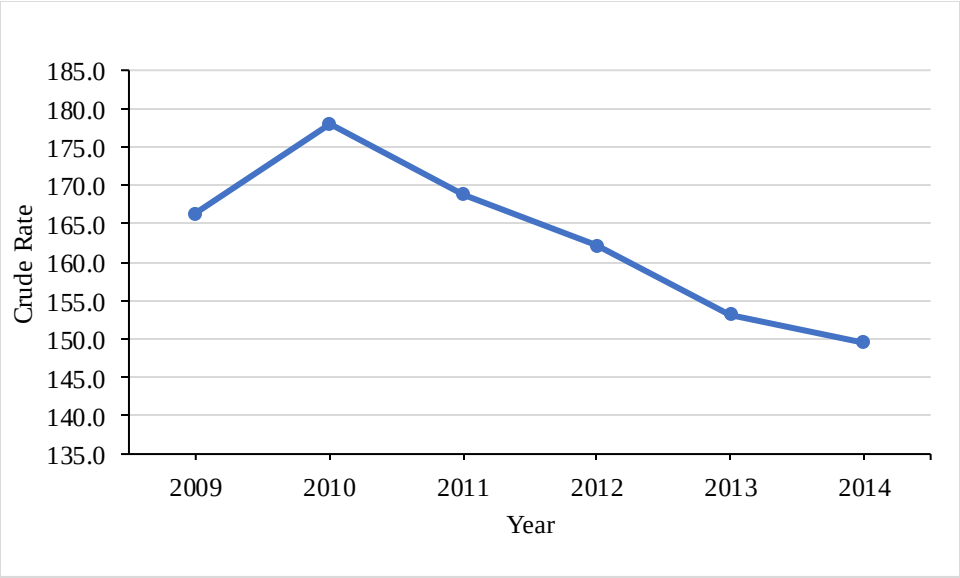
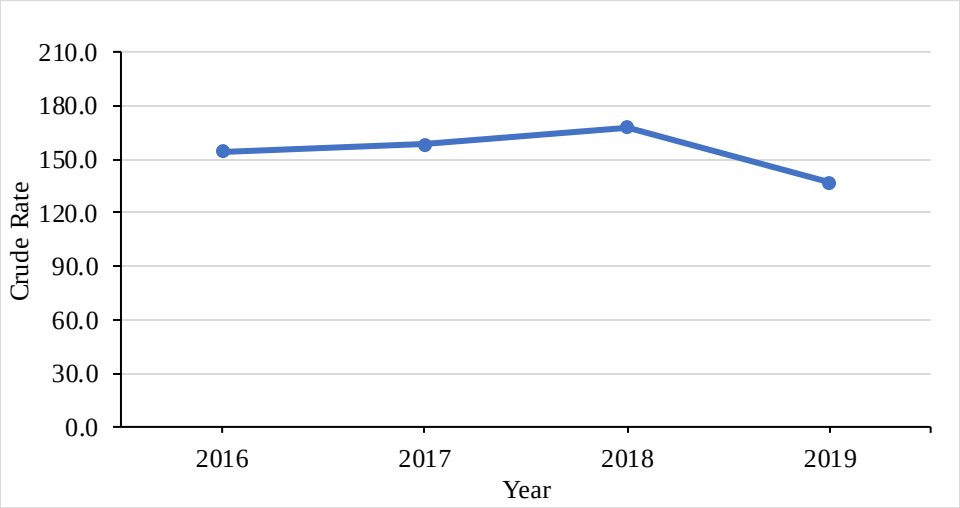


Figure 2.2 Annual Crude Work-Related Hospitalizations Rate (per 100,000 employed persons), NYS, 2016-2019



Data Source: State Inpatient Hospital Discharge Data

References:

1. Dembe AE, Mastroberti MA, Fox SE, Bigelow C, Banks SM. Inpatient hospital care for work-related injuries and illnesses. Am J Ind Med 2003; 44:331-342.
2. Sorock GS, Smith E, Hall N. An evaluation of New Jersey's hospital discharge database for surveillance of severe occupational injuries. Am J Ind Med 1993; 23:427-437.

Technical Notes:

- Includes non-federal, acute care hospitals only.
- Primary payer must be workers' compensation.
  –Self-employed individuals such as farmers and independent contractors, railroad or longshore and maritime workers may not be covered by state workers' compensation systems.
- Estimates include employed persons aged 16 years and older.
- Hospitalizations were identified using the ICD-9-CM till the 3rd quarter of 2015, followed by ICD-10-CM codes 4th quarter of 2015 onwards.
- Excludes patients with unknown age, out-of-state residents and unknown residence, and out-of-state inpatient hospitalizations.
- Annual rates of hospitalizations are calculated by using the number of inpatient hospitalizations and the Bureau of Labor Statistics' *Geographic Profile of Employment and Unemployment*, which is based on Current Population Survey (CPS) estimates.

Limitations:

- State hospital discharge data are subject to certain limitations:
  – Many individuals with work-related illnesses or injuries do not file for workers' compensation or fail to recognize work as the cause of their illness or injury.
  – Attribution of primary payer in hospital discharge data may not be accurate.
  – All hospital admissions are counted, including multiple admissions for a single individual.

Indicator 3: Fatal Work-Related Injuries

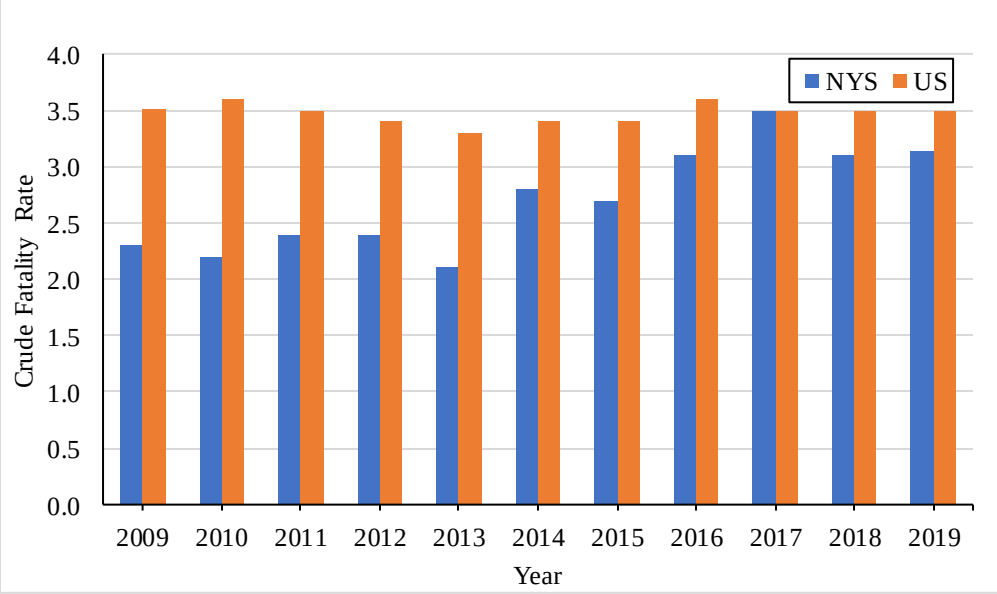
A fatal work-related injury is an injury occurring at work that results in death. Since 1992, the Bureau of Labor Statistics (BLS) has conducted the Census of Fatal Occupational Injuries (CFOI) using multiple data sources to provide complete counts of all fatal work-related injuries in the nation and in every state.[1] CFOI includes fatalities resulting from non-intentional injuries such as falls, electrocutions, and acute poisonings as well as from motor vehicle crashes that occurred during travel for work. Also included are intentional injuries (i.e., homicides and suicides) that occurred at work. Fatalities that occur during a person's commute to or from work are not counted.

In 2019, there were 273 work-related fatalities reported in NYS workers (Table 3). The crude fatality increased from 2.3 in 2009 to 3.1 in 2019 (Figure 3). The highest crude rate was reported in 2017, and the lowest rate was reported in 2013 (Figure 3). The NYS crude fatality rate was lower than the US rate for all years except 2017 (3.5).

Table 3. Annual Number of Work-Related Fatal Injuries, NYS, US, 2009-2019

YEAR	NYS	US
2009	185	4,551
2010	182	4,690
2011	206	4,693
2012	202	4,628
2013	178	4,585
2014	241	4,821
2015	236	4,836
2016	272	5,190
2017	313	5,147
2018	271	5,250
2019	273	5,333

Figure 3. Annual Crude Work-Related Fatal Injury Rate (per 100,000 FTEs), NYS, US, 2009-2019



Data Source: Bureau of Labor Statistics' (BLS) Census of Fatal Occupational Injuries (CFOI)

References:

1. United States Bureau of Labor Statistics. Injuries, Illnesses, and Fatalities (IIF). IIF Latest Numbers. 2022 https://www.bls.gov/iif/latest-numbers.htm

Technical Notes:

- Fatalities are reported by state in which the incident occurred (https://www.bls.gov/iif/).
- Fatalities of workers younger than 16, active-duty military, and volunteers are included in the numerator but are excluded from the denominator used for calculating the rates presented in Figure 3.
- The denominator that the Bureau of Labor Statistics (BLS) uses to calculate fatality rates has changed over time from the number of workers employed to the quantity of hours worked. The new hours-based rates use the average number of employees at work and the average hours each employee works. To be consistent with the BLS, the denominator for fatal work-related injury rates for this indicator has changed from the number employed, as indicated in the Geographic Profiles, to the number of hours worked which is designated as Full-Time-Equivalent workers or FTEs.

Limitations:

- Denominator data from CPS used for calculating rates are based on state of residence. Rates may overestimate risk if fatal incidents involved victims who were out-of-state residents. Likewise, rates may be underestimated if fatal incidents occurred in other states.
- BLS uses a different methodology to calculate fatal work-related injury rates; as a result, rates presented here may differ from the BLS published rates.

Indicator 4: Work-Related Amputations with Days Away from Work

An amputation is defined as full or partial loss of a protruding body part – an arm, hand, finger, leg, foot, toe, ear, or nose. An amputation may greatly reduce a worker's job skills and earning potential as well as significantly affect their general quality of life. The Bureau of Labor Statistics' (BLS) Annual Survey of Occupational Injuries and Illnesses provides yearly state and national estimates of the numbers and incidence rates of work-related amputations that involve at least one day away from work.

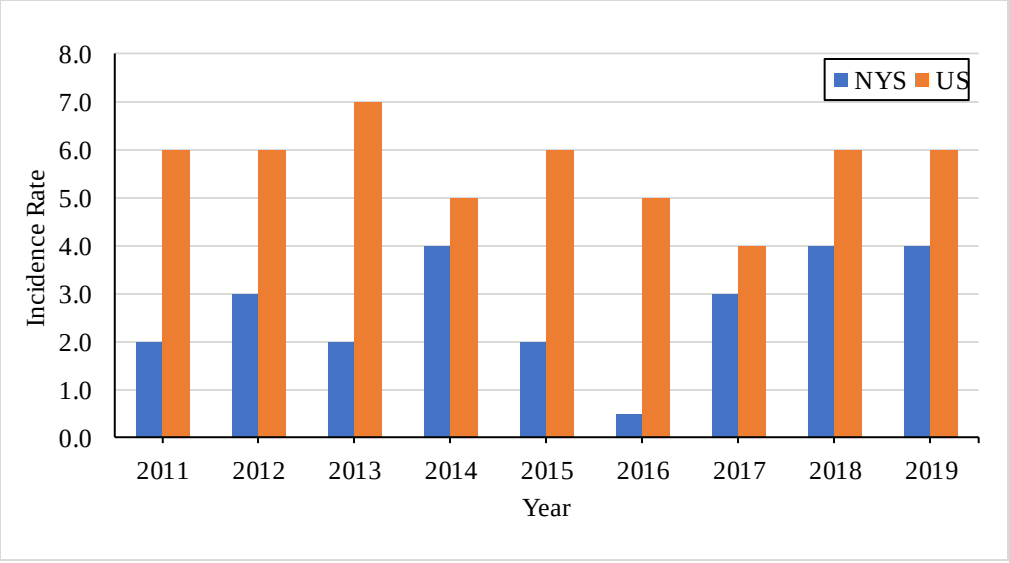
In 2011, the BLS began using a revised version of the Occupational Injuries and Illnesses Classification System (OIICS) manual to code case characteristics associated with work-related injuries, illnesses, and fatalities. Due to the extensive revisions in the new version of OIICS, BLS cautions users against directly comparing Event, Source, Secondary Source, Part, and Nature case characteristic codes from 1992-2010 to data from 2011 onward, so 2009-2010 rates have been excluded for this indicator in the report. There were 240 cases in NYS in 2019, which was a 1.6-fold increase from 100 cases in 2011. The highest incident rate for NYS was 4.0 amputations per 100,000 FTEs reported in 2014,2018 and 2019, whereas it was the lowest in 2016. (Figure 4).

Table 4. Annual Number of Work-Related Amputations Involving Days Away from Work, NYS, US, 2011-2019

YEAR	NYS	US
2011	100	5,000
2012	160	5,120
2013	140	6,160
2014	210	4,250
2015	120	5,360
2016	300	5,060
2017	180	4,440
2018	280	5,920
2019	240	N/A

Note: N/A: Data for US was unavailable for 2019

Figure 4. Annual Incidence Rate (per 100,000 FTEs) of Work-Related Amputations Involving Days Away from Work NYS, US, 2011-2019



Data Source: Bureau of Labor Statistics' (BLS) Annual Survey of Occupational Injuries and Illnesses (SOII)

Technical Notes:

- Employers are required to follow Occupational Safety and Health Administration (OSHA) regulations for recording work-related cases of injuries and illnesses.

– Includes events that result in death, loss of consciousness, days away from work, restricted work, or medical treatment beyond first aid.
– Detailed case characteristics (e.g., nature, body part, event) are reported when the injury or illness results in at least one day away from work.
– Approximately 14% of the workforce are not included (military, self-employed individuals, private household workers, workers on farms with 10 or fewer employees, and Federal agencies) as these worker groups fall outside the scope of the Occupational Safety and Health Act of 1970.
Rates published by BLS are reported as the number of injury and illness cases per 100 full-time equivalents (FTEs). Rates presented in Figure 4 are reported as cases per 100,000 FTEs and were derived by multiplying BLS published rates by 1,000.

- Annual incidence rates of amputations involving days away from work are reported as amputations per 100,000 full-time equivalents (FTEs) in Figure 4. Rates reported by BLS are per 10,000 FTEs.

Limitations:

- The SOII estimates are subject to several limitations:
– Employers do not always record all relevant events. Employers are only required to report the detailed case characteristics (e.g., nature of the disabling condition, body part affected, and event and source producing the condition) when the injury or illness results in at least one day away from work beyond the day of injury or onset of illness.
– Employers are often unaware of work-related conditions. This may include cases in which medical care from personal health care providers was sought, conditions with long latencies, and conditions that are diagnosed after an employee leaves an employer.
– Employers may place affected workers on restricted work activity, thereby avoiding the requirement to report lost workday cases.
– SOII data are based on year of incident and are collected shortly after the end of the calendar year. Thus, lost work-time cases that carry over to a new calendar year may not be captured.

Indicator 5: Work-Related Amputation filed with Workers Compensation System

Claims data from state workers' compensation systems were used as the data source for this OHI. Cases were limited to amputations identified through "lost time" claims. These are claims for which workers missed sufficient time from work to qualify for benefits to compensate for lost wages and/or functional impairments for time loss.

In 2011, BLS began using a revised version of the Occupational Injuries and Illnesses Classification System (OIICS) manual to code case characteristics associated with work-related injuries, illnesses, and fatalities. Due to the extensive revisions in the new version of OIICS, BLS cautions users against directly comparing Event, Source, Secondary Source, Part, and Nature case characteristic codes from 1992–2010 to data from 2011 onward. Thus, data for 2009-2010 has been excluded from this indicator in the report.

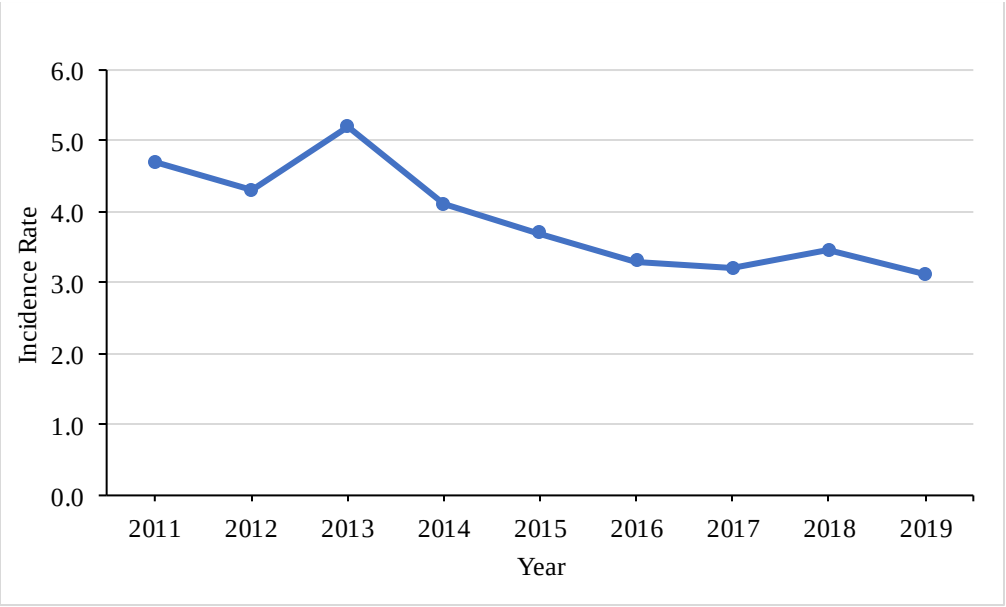
There were 290 work-related amputation cases filed with the NYS Workers Compensation System in 2019 (Table 5). The incidence rate was 4.7 in 2011, which decreased overall to its lowest (3.1) in 2019 (Figure 5). The highest incidence rate (5.2) was reported in 2013.

Table 5. Annual Number of Work-related Amputations filed with State Workers' Compensation System, NYS, 2011-2019

YEAR	NYS
2011	387
2012	359
2013	445
2014	354
2015	331
2016	296
2017	289
2018	321
2019	290

Note: Due to extensive revision in coding for amputations in the OIICS new version, data from 2009-2010 should not be compared to data 2011 onwards, and has been excluded for this indicator. Data for US was not collected.

Figure 5. Annual Incidence Rate (per 100,000 covered workers), of Work-related Amputations filed with State Workers' Compensation System, NYS, 2011-2019



Data Source: New York State Workers' Compensation Data

Technical Notes:

- "Covered" workers are those who are eligible for compensation should they sustain work-related injuries or illnesses.
- Federal employees, railroad workers, long shore and maritime workers may not be covered by state workers' compensation systems.
- State compensation systems used various coding systems to identify amputations including:
  – American National Standards Institute Z16.2 (ANSI Z16.2) – Nature of Injury Code = 100 'Amputation/Enucleation'.
  – Occupational Injury and Illness Classification System (OIICS) – Nature of Injury Code = 031 'Amputation,' or OIICS 2.01 – Nature of Injury Code = 1311 – 'Amputations'.
  – National Council on Compensation Insurance, Inc. (NCCI)/Workers' Compensation Insurers Organization – Nature of Injury Code = 02 'Amputations'.
- Annual incidence rates of amputation cases are calculated by using the number of claims for amputations from state workers' compensation systems and the number of workers covered as reported by the National Academy of Social Insurance.

Limitations:

- Workers' compensation data are subject to a few limitations:
  – Workers' compensation data are not complete for a variety of reasons. Many individuals with work-related illnesses and many with work-related injuries do not file for workers' compensation. Workers' compensation claims may be denied. Self-employed individuals (e.g. farmers, independent contractors, and small business owners), corporate executives, domestic and agricultural workers may be exempt from coverage.
  – Variability in the coding systems used by state workers' compensation systems precludes a universal method for identifying amputation cases.
  – Variables within state workers' compensation systems may be incomplete and are often not subject to quality control.

Indicator 6: Work-Related Burn Hospitalizations

Burns encompass injuries to tissues caused by contact with dry heat (fire), moist heat (steam), chemicals, electricity, friction, or radiation. Burns are among the most expensive work-related injuries to treat and can result in significant disability. Thermal and chemical burns are the most frequent types of work-related burn injury. A substantial proportion of burns occur in the service industry, especially in food service, often disproportionately affecting working adolescents.[1,2] Nationally, it has been estimated that 150,000 people with work-related burns are treated in emergency rooms annually.[3] Approximately 30% to 40% of hospitalizations for burns among adults have been found to be work-related.[2] In 2019, there were 136 work-related burn hospitalizations reported among NYS workers (Table 6.1).

Work-related burn hospitalizations were identified using the ICD-9-CM codes through 09/30/2015, followed by ICD-10-CM codes from 10/01/2015 and thereafter. 2015 hospitalization data used both ICD-9-CM and ICD-10-CM codes and this transition in classification of burns between ICD-9-CM and ICD-10-CM may not be a one-to-one match. Thus, we consider the transition from the ICD-9-CM to the ICD-10-CM a break-in series. Any comparisons prior to or to years after 2015 is not advised. The annual rate for burn hospitalizations coded using ICD-9-CM was 2.8 in 2009 and 2.5 in 2014 (Figure 6.1). The annual rate for burn hospitalizations coded using ICD-10-CM was 1.9 in 2016 and 1.5 in 2019 (Figure 6.2).

Table 6.1 Annual Number of Work-Related Burn Hospitalizations, NYS, 2009-2019

YEAR	NYS
2009	245
2010	285
2011	234
2012	252
2013	161
2014	226
2015	*
2016	175
2017	161
2018	157
2019	136

*2015 is a break-in series due to transition in ICD coding and is listed separately in Table 6.2 by respective ICD coding. Data for US was not collected.

Table 6.2 Number of Worker-Related Burn Hospitalizations, NYS, 2015, by ICD coding

YEAR	NYS
2015 (Q1, Q2, Q3) ICD-9-CM	153
2015 (Q4) ICD-10 CM	43

Note: Q1 – 1st Quarter, Q2 – 2nd Quarter, Q3 – 3rd Quarter, Q4 – 4th Quarter

Figure 6.1 Annual Work-Related Burn Hospitalization Rate (per 100,000 employed), NYS, 2009-2014

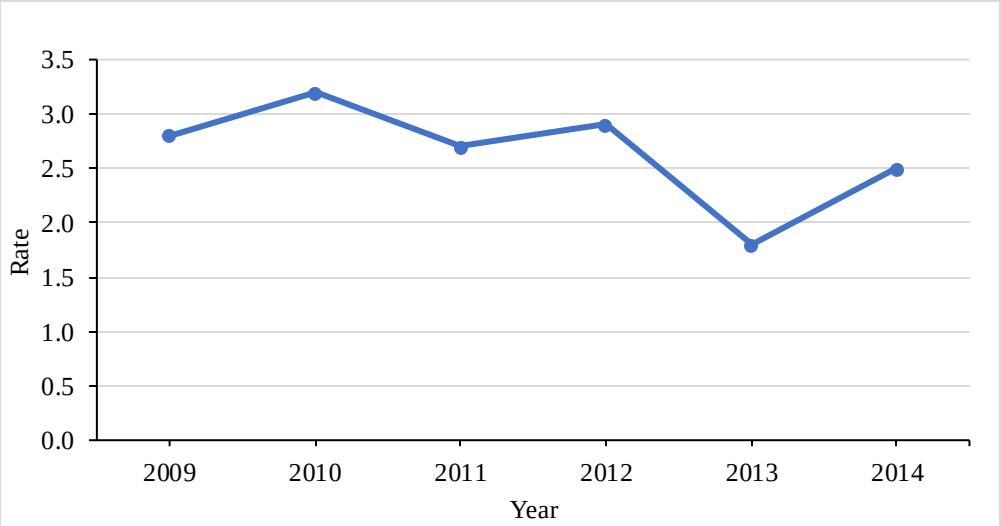
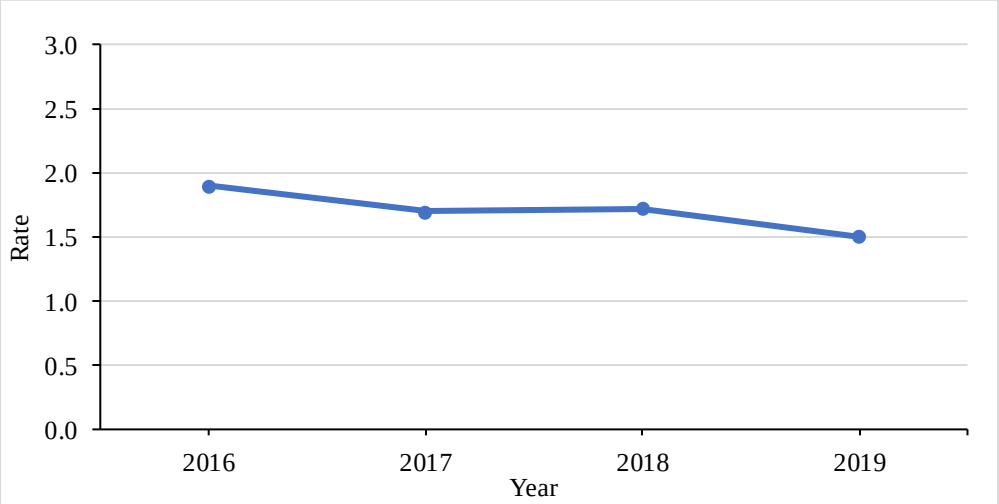


Figure 6.2 Annual Rate (per 100,000 employed) of Work-Related Burn Hospitalizations, NYS, 2016-2019



Data Source: State Inpatient Hospital Discharge Data (Statewide Planning and Research Cooperative System-SPARCS)

References:

1. Centers for Disease Control and Prevention (CDC). Occupational burns among restaurant workers--Colorado and Minnesota. MMWR Morb Mortal Wkly Rep. 1993; 42(37):713-6.
2. Baggs J, Curwick C, Silverstein B. Work-related burns in Washington State, 1994-1998. J Occup Environ Med. 2002; 44:692-9.
3. Rossignol AM, Locke JA, Burke JF. Employment status and the frequency and causes of burn injuries in New England. J Occup Med. 1989; 31:751-757.

Technical Notes:

- Includes non-federal, acute care hospitals only.
- Primary expected payer must be workers' compensation.
  – Self-employed individuals such as farmers and independent contractors, federal employees, railroad, or longshore and maritime workers may not be covered by state workers' compensation systems.
- Estimates include employed persons aged 16 years and older.
- Excludes patients with unknown age, out-of-state residents and unknown residence, and out-of-state inpatient hospitalizations.

- Annual rates of hospitalizations are calculated by using the number of inpatient hospitalizations and the Bureau of Labor Statistics' *Geographic Profile of Employment and Unemployment*, which is based on Current Population Survey (CPS) estimates for state-specific number of employed persons.
- 2015 hospitalization data used both ICD-9-CM and ICD-10-CM. Burn hospitalizations for the 1st through 3rd quarters of 2015 were identified by a principal diagnosis of ICD-9-CM codes 940-949. Burn hospitalizations for the 4th quarter of 2015 and thereafter were identified by a principal diagnosis of ICD-10-CM codes T20-T25, T26-T28, and T30-T32.

Limitations:

- State hospital discharge data are subject to several limitations:
  –Practice patterns and payment mechanisms may impact decisions by health care providers to hospitalize patients, correctly diagnose work-related conditions, and/or list conditions as a discharge diagnosis.
  –Many individuals with work-related illnesses or injuries do not file for workers' compensation or fail to recognize work as the cause of their illness or injury.
  –Attribution of primary payer in hospital discharge data may not be accurate.
  –All hospital admissions are counted, including multiple admissions for a single individual.
- 2015 hospitalization data used both ICD-9-CM and ICD-10-CM codes and this transition in classification of burns between ICD-9-CM and ICD-10-CM may not be a one-to-one match. Any comparisons prior to or for years after 2015 is not advised.
- Burn hospitalizations were identified using the ICD-9-CM codes from 2009 through 09/30/2015, followed by ICD-10-CM codes from 10/01/ 2015 onwards. Thus, it should be noted that changes in 2015 data could likely be due to change in the ICD coding and comparison is not suggested. The change in coding is a major limitation if comparing years with ICD-9 against years with ICD-10 coding.

Indicator 7: Work-Related Musculoskeletal Disorders

Work-related musculoskeletal disorders (MSDs) are injuries or disorders of muscles, tendons, nerves, ligaments, joints, or spinal discs that are caused or aggravated by work activities. Workplace risk factors for MSDs include repetitive forceful motions, awkward postures, use of vibrating tools or equipment, and manual handling of heavy, awkward loads. These disorders also can be caused by single, traumatic events such as falls. MSDs are some of the most common and costly work-related health problems. These injuries can significantly impact the ability of workers to perform their jobs and affect quality of life both on and off the job. According to annual SOII data, MSDs have consistently accounted for over one-third of all work-related injuries and illnesses involving days away from work reported by employers over the last decade.[1] Direct workers' compensation costs of work-related MSDs have been estimated at $20 billion annually in the US, and total costs of these injuries when including indirect costs, such as lost productivity, range as high as $54 billion.[2]

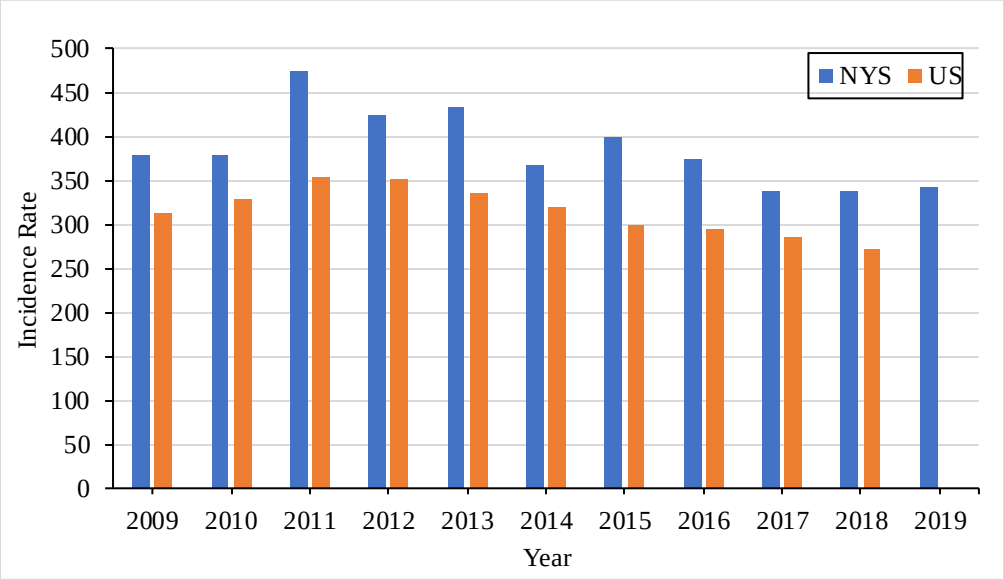
There were 272,780 MSDs reported in the US in 2018 and 21,940 MSDs in NYS in 2019 (Table 7). The NYS incidence rate per 100,000 employed workers was the highest in 2011 (474), and lowest in 2017 and 2018 (343 per 100,000 employed workers) (Figure 7). However, the NYS rates exceeded the US incidence rates for every year from 2009 to 2019.

Table 7. Estimated Annual Number of All Work-related MSDs Involving Days Away from Work, NYS, US, 2009-2019

YEAR	NYS	US
2009	21,880	283,800
2010	21,450	284,340
2011	26,940	311,840
2012	24,650	316,740
2013	25,600	307,640
2014	22,140	298,460
2015	24,390	286,350
2016	23,170	285950
2017	21,150	282,750
2018	21,600	272,780
2019	21,940	N/A

Note: N/A: Data for US was unavailable for 2019.

Figure 7. Estimated Annual Incidence Rate (per 100,000 FTEs) of All Work-related MSDs Involving Days Away from Work NYS, US, 2009-2019



Data Source: Bureau of Labor Statistics' (BLS) Annual Survey of Occupational Injuries and Illnesses (SOII)

References:

1. National Institute for Occupational Safety and Health. Worker Health Chartbook, 2004. Cincinnati OH: U.S. Department of Health and Human Services, Center for Disease Control and Prevention, DHHS (NIOSH) Publication No. 2004-146. 2004. Available: http://www.cdc.gov/niosh/docs/chartbook/pdfs/2004-146.pdf
2. Institute of Medicine and National Research Council, Musculoskeletal Disorders and the Workplace; Low back and Upper Extremities. National Academy Press, Washington, D.C. 2001; page 58.

Technical Notes:

- Employers are required to follow Occupational Safety and Health Administration (OSHA) regulations for recording work-related cases of injuries and illnesses.
  – Includes events that result in death, loss of consciousness, days away from work, restricted work, or medical treatment beyond first aid.
  – Detailed case characteristics (e.g., nature, body part, event) are reported when the injury or illness results in at least one day away from work.
  – Approximately 14% of the workforce are not included (military, self-employed individuals, private household workers, workers on farms with 10 or fewer employees, and Federal agencies) as these worker groups fall outside the scope of the Occupational Safety and Health Act of 1970.
- Rates of MSDs involving days away from work are reported per 100,000 full-time equivalents (FTEs) were derived by multiplying BLS published rates by 1,000.

Limitations:

- The SOII estimates are subject to several limitations:
  – Employers do not always record all relevant events. Employers are only required to report the detailed case characteristics (e.g., nature of the disabling condition, body part affected, and event and source producing the condition) when the injury or illness results in at least one day away from work beyond the day of injury or onset of illness.
  – Employers are often unaware of work-related conditions. This may include cases in which medical care from personal health care providers was sought, conditions with long latencies, and conditions that are diagnosed after an employee leaves an employer.
  – Employers may place affected workers on restricted work activity, thereby avoiding the requirement to report lost workday cases.
  – SOII data are based on year of incident and are collected shortly after the end of the calendar year. Thus, lost work-time cases that carry over to a new calendar year may not be captured.

Indicator 8: Carpal Tunnel Syndrome Cases filed with Workers' Compensation System

Carpal tunnel syndrome (CTS) occurs when the median nerve is compressed at the wrist. Symptoms range from a burning, tingling, or numbness in the fingers to difficulty gripping or holding objects. Workplace factors that may cause or aggravate CTS include direct trauma, repetitive forceful motions or awkward postures of the hands, and use of vibrating tools or equipment.[1] CTS has the longest average disability duration among the top ten workers' compensation conditions in the US.[2]

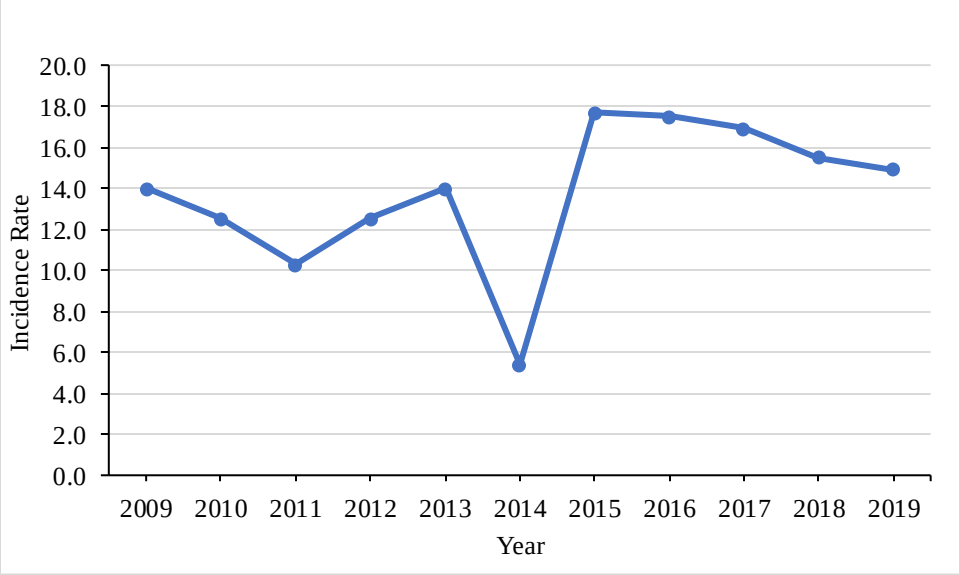
There were 13,283 CTS cases filed by the NYS workers' compensation system from 2009 to 2019 (Table 8). The incidence rate per 100,000 employed workers increased from 14.0 in 2009 to 14.9 in 2019. The rate was the lowest at 5.4 per 100,000 employed workers in 2014 but peaked to 17.7 in 2015. However, from 2016 onwards the rate decreased (Figure 8).

Table 8. Annual Number of Lost Worktime Claims for Carpal Tunnel Syndrome Identified in the State Workers' Compensation System, NYS, 2009-2019

YEAR	NYS
2009	1,148
2010	1,025
2011	856
2012	1,057
2013	1,197
2014	468
2015	1,580
2016	1,578
2017	1,546
2018	1,441
2019	1,387

Note: Data for US was not collected.

Figure 8. Annual Incidence Rate (per 100,000 covered workers) of Claims for Carpal Tunnel Syndrome Cases Filed with State Workers' Compensation System, NYS, 2009-2019



Data Source: New York State Workers' Compensation Data

References:

1. Sevy JO, Sina RE, Varacallo M. Carpal Tunnel Syndrome. 2023 Oct 29. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024

Technical Notes:

- "Covered" workers are those who are eligible for compensation should they sustain work-related injuries or illnesses.
- Federal employees, railroad workers, long shore and maritime workers may not be covered by state workers' compensation systems.
- NYS compensation systems included claims with indemnity benefits and used the OIICS coding systems to identify amputations: – Occupational Injury and Illness Classification System (OIICS) – Nature of Injury Code = 1241 'Carpal Tunnel Syndrome
- Annual incidence rates of carpal tunnel syndrome cases are calculated by using the number of claims for carpal tunnel syndrome from state workers' compensation systems and the number of workers covered as reported by the National Academy of Social Insurance.

Limitations:

– Workers' compensation data are not complete for a variety of reasons. Many individuals with work-related illnesses and many with work-related injuries do not file for workers' compensation. Workers' compensation claims may be denied. Self-employed individuals (e.g. farmers, independent contractors, and small business owners), corporate executives, domestic and agricultural workers may be exempt from coverage.

– Variability in the coding systems used by state workers' compensation systems precludes a universal method for identifying amputation cases.

– Variables within state workers' compensation systems may be incomplete and are often not subject to quality control.

Indicator 9: Hospitalizations from or with Pneumoconiosis

Pneumoconiosis is a term for a class of non-malignant lung diseases caused by the inhalation of mineral dust, nearly always in occupational settings. Most cases of pneumoconiosis develop only after many years of cumulative exposure; thus, they are usually diagnosed in older individuals, often long after the onset of exposure. These diseases are incurable and may ultimately result in death.[1] Pneumoconiosis includes silicosis, asbestosis, coal workers' pneumoconiosis, and, less commonly, pneumoconiosis due to a variety of other mineral dusts, including talc, aluminum, bauxite, and graphite. Byssinosis and several other dust-related lung diseases are sometimes grouped with "pneumoconiosis," even though they are caused by occupational exposure to organic (e.g., cotton) dust. Individuals with certain kinds of pneumoconiosis are at increased risk of other diseases, including cancer, tuberculosis, autoimmune conditions, and chronic renal failure.

In 2009, there were 1,022 hospitalizations from pneumoconiosis (ICD-9-CM), and 2,309 hospitalizations in 2014 (Table 9.1). Pneumoconiosis hospitalizations were identified using the ICD-9-CM codes through 09/30/2015, followed by ICD-10-CM codes from 10/01/2015 and thereafter. 2015 hospitalization data used both ICD-9-CM and ICD-10-CM codes (Table 9.2) and this transition in classification of burns between ICD-9-CM and ICD-10-CM may not be a one-to-one match. Thus, we consider the transition from the ICD-9-CM to the ICD-10-CM a break-in series. Any comparisons prior to or for years after 2015 is not advised. The age-standardized rate for hospitalizations coded using ICD-9-CM decreased consistently from 138.5 in 2009 to 78.5 in 2014. The age-standardized rate for hospitalizations coded using ICD-10-CM coding was 51.9 in 2016 and 51.9 in 2019 (Figure 9.2).

Table 9.1 Annual Number of All Pneumoconiosis Hospitalizations, NYS, 2009-2019

YEAR	NYS
2009	2,309
2010	2,170
2011	1,812
2012	1,604
2013	1,458
2014	1,312
2015	*
2016	1,079
2017	1,089
2018	1,106
2019	1,022

Note: *2015 is a break-in series due to transition in ICD coding and is listed separately in Table 6.2 by respective ICD coding. Data for US was not collected.

Table 9.2 Number of Pneumoconiosis Hospitalizations, NYS, 2015 by ICD-CM Coding for Hospitalizations

YEAR	NYS
2015 (Q1, Q2, Q3) ICD-9-CM codes 500-505	1058
2015 (Q4) ICD-10-CM codes J60–J66	278

Note: Q1 – 1st Quarter, Q2 – 2nd Quarter, Q3 – 3rd Quarter, Q4 – 4th Quarter

Figure 9.1 Annual Age-standardized, Rate (per 1,000,000 residents) of Total Pneumoconiosis Hospitalizations, NYS, 2009-2014

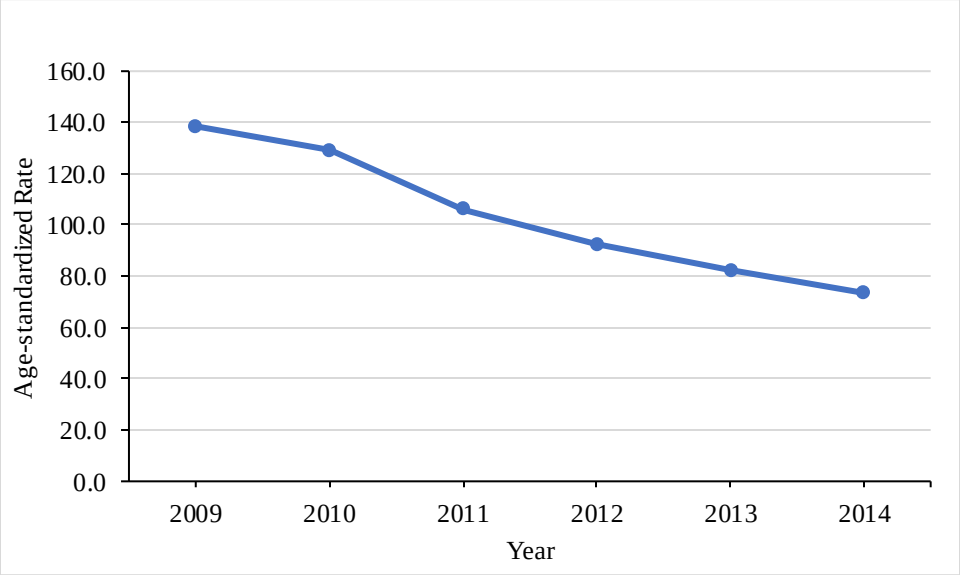
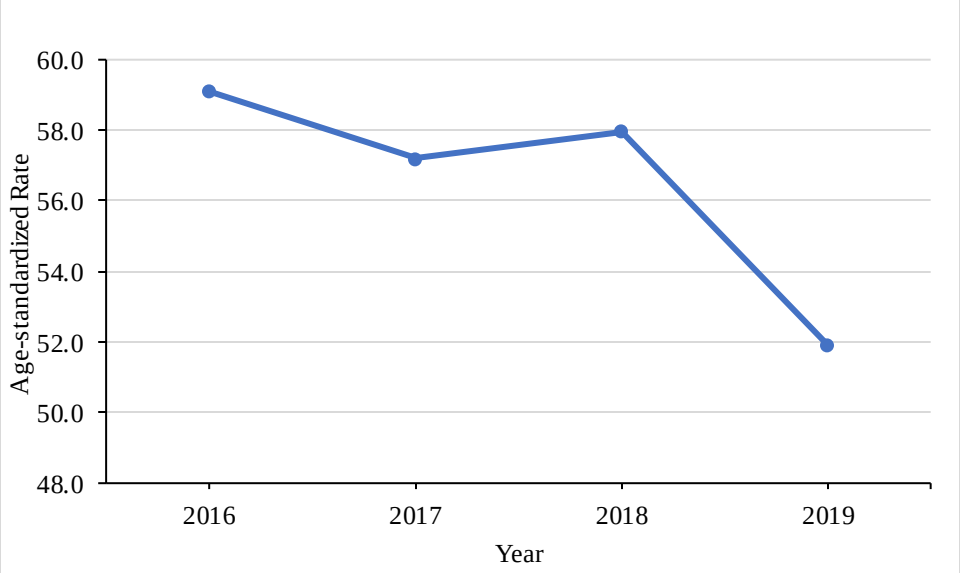


Figure 9.2 Annual Age-standardized, Rate (per 1,000,000 residents) of Total Pneumoconiosis Hospitalizations, NYS, 2016-2019



Data Source: New York State Inpatient Hospital Discharge Data and Census Bureau's State Population Estimates

References:

1. Christiani DC, Wegman DH. Respiratory disorders, In: Occupational Health: Recognizing and Preventing Work-Related Disease (3rd ed.) Levy BS, Wegman DH (eds.) Little, Brown, 1995; 427-454.

Technical Notes:

- Includes non-federal, acute care hospitals only.
- Hospitalizations for pneumoconiosis were identified using the ICD-9-CM codes 500-505 through 9/30/2015, followed by ICD-10-CM codes J60-J66 4th quarter of 2015 onwards.
- Excludes patients with unknown age, out-of-state residents and unknown residence, and out-of-state inpatient hospitalizations.
- Cells with less than 5 hospitalizations may be too small to produce reliable estimates or may violate confidentiality requirements.
- Annual rates of hospitalizations presented in Figure 9 are calculated by using the number of inpatient hospitalizations and the American Community Survey Demographic and Housing Estimates (https://data.census.gov/)

Limitations:

- State hospital discharge data are subject to several limitations:
  – Workers hospitalized for injuries in each state, but who reside in a different state, will not be included in the case count for this indicator.
  – Practice patterns and payment mechanisms may impact decisions by health care providers to hospitalize patients, correctly diagnose work-related conditions, and/or list conditions as a discharge diagnosis.
  – All hospital admissions are counted, including multiple admissions for a single individual.
- Pneumoconioses are typically chronic diseases of long latency (pre-clinical period). Furthermore, current incidence is not necessarily indicative of current exposure. Therefore, it may be many years before reductions in occupational exposures affect hospitalizations.

Indicator 10: Mortality from or with Pneumoconiosis

All states collect cause-of-death information on death certificates, including both the underlying and contributing causes of death. From 1990 through 1999, pneumoconiosis was an underlying or contributing cause of more than 30,000 deaths in the US, for an overall age-adjusted annual mortality rate of 15.8 per million population among those aged 15 and older. Pneumoconiosis was the underlying cause of death in approximately one-third of these deaths.[2] Mortality from most kinds of pneumoconiosis has gradually declined over the past three decades except for asbestosis, which has increased more than tenfold.

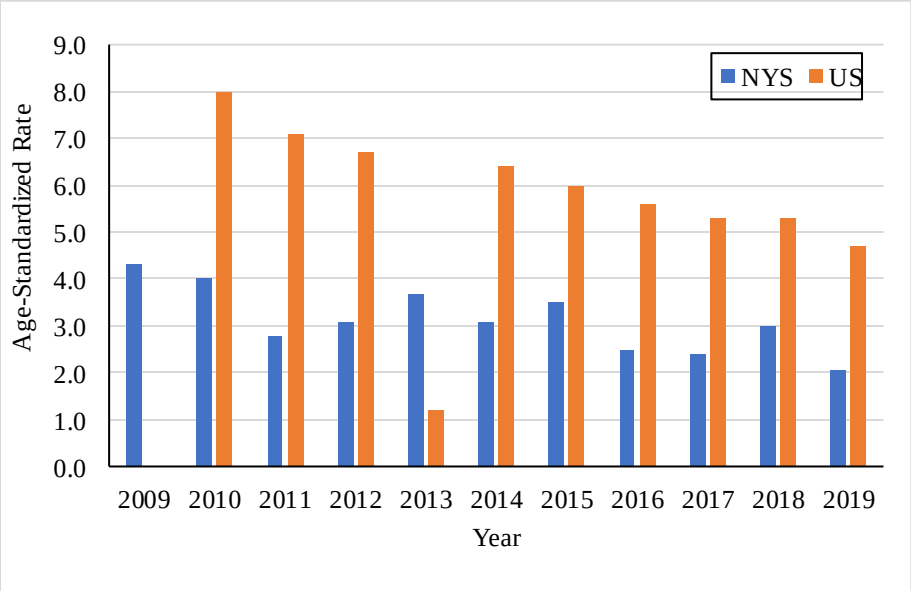
In 2019, there were 57 mortalities (Table 10) from or with pneumoconiosis amongst NYS (excluding NYC) residents aged 15 and older. The age-standardized mortality rate in NYS was highest in 2009 and lowest in 2019 (Figure 10). The NYS rate remained consistently lower than the national rate except in 2013 where the NYS rate was three times higher than the national rate.

Table 10. Annual Number of Total Pneumoconiosis Deaths Among NYS (excluding NYC) Residents Aged 15 years and Older, US, 2009-2019

YEAR	NYS	US
2009	73	N/A
2010	67	2,037
2011	47	1,890
2012	49	1,850
2013	64	1,859
2014	55	1790
2015	59	1,735
2016	43	1,662
2017	48	1,636
2018	58	1,632
2019	57	1,525

Note: N/A: Data was not available for US for 2009

Figure 10. Annual Age-Standardized Total Pneumoconiosis Death Rate (per 1,000,000 residents), among NYS (excluding NYC) Residents Aged 15 Years and Older, US, 2009-2019



Data Sources: New York State Vital Records (NYC excluded); U.S. Bureau of the Census American Community Survey

References:

1. National Institute for Occupational Safety and Health. Work-related lung disease surveillance report 2002. Cincinnati, OH: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. DHHS (NIOSH) Number 2003-111. 2003. (https://www.cdc.gov/niosh/docs/2003-111/pdfs/2003-111.pdf?id=10.26616/NIOSHPUB2003111)

Technical Notes:

- NYC Data is not included for this indicator.
- Includes persons aged 15 years or older.
- includes ICD-10 codes J60-J66 (All pneumoconiosis); ICD-10 code J60 (Coal workers' pneumoconiosis); ICD-10 code J61 (Asbestosis); ICD-10 code J62 (Silicosis); ICD-10 codes J63-J66 (Other or unspecified pneumoconiosis)
- Excludes patients with unknown age, out-of-state residents and unknown residence, and out-of-state deaths.
- Age-standardized rates are based on the 2000 U.S. Standard Population and the Census Bureau's Population Estimates. Rates are expressed as deaths per one million residents.
  – Rates are not calculated for cells with <5 deaths.

Limitations:

- State vital are subject to certain limitations:
  –Data only includes NYS excluding NYC
  –Causes of death listed on the death certificate may be inaccurate
  –Th number of contributing causes of death listed on the death certificate may vary by person completing the death certificate and geographic region.
  –Death certificates identify only a small percentage of individuals who develop pneumoconiosis.
  –Decedent's state of residence may not have been the same as the state of exposure.
- Pneumoconioses are typically chronic diseases of long latency (pre-clinical period). Furthermore, current incidence is not necessarily indicative of current exposure. Therefore, it may be many years before reductions in occupational exposure affect deaths from Pneumoconioses.

Indicator 11: Acute Work-Related Pesticide-Associated Illness and Injury Reported to Poison Control Centers

A pesticide is a substance or mixture of substances used to prevent or control undesired insects, plants, animals, or fungi. In the US, approximately one billion pounds of pesticides are used annually, contained in more than 16,000 pesticide products.[1] Although the value of pesticides in protecting the food supply and controlling disease vectors is well recognized, it is also recognized that pesticides can cause harm to people and the environment. Adverse health effects from exposure vary depending on the amount and route of exposure and the type of chemical used. Agricultural workers and pesticide applicators are at greatest risk for the more severe pesticide poisonings.

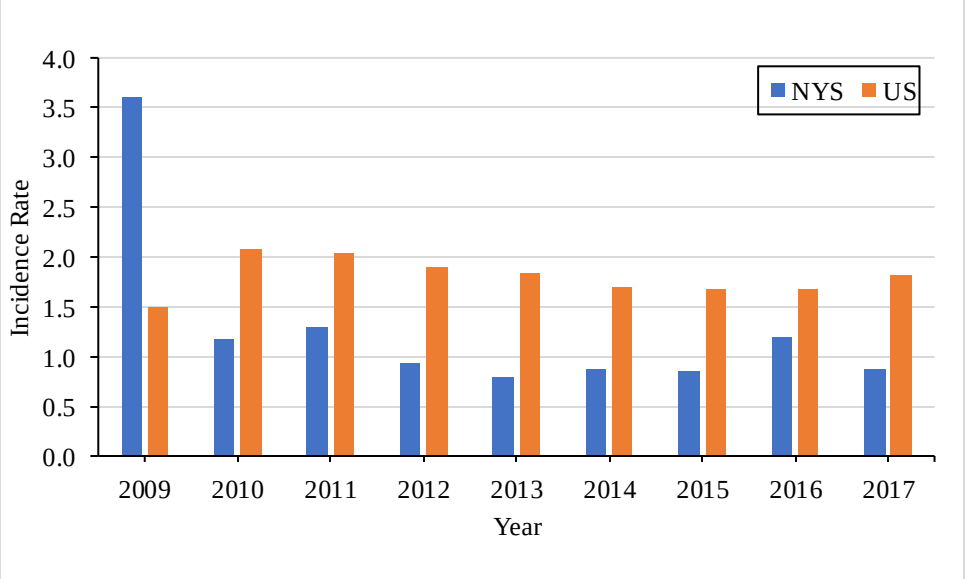
There were 813 total pesticide poisoning cases in NYS from 2009 to 2019 reported to the NY Poison Control Centers (PCC). The highest incidence rate of acute pesticide-related injuries was reported in 2009 (Figure 11). The NYS rate remained lower than the US rate for all years except 2009, where the state rate was more than two times the national rate.

Table 11. Annual Number of Reported Work-Related Pesticide Poisoning Cases, NYS, US, 2009-2017

YEAR	NYS	US
2009	10	2,040
2010	103	2,871
2011	114	2,857
2012	82	2,696
2013	74	2,631
2014	78	2,494
2015	79	2,490
2016	109	2,490
2017	82	2,776
2018	N/A	N/A
2019	N/A	N/A

Note: N/A: Data was not collected for 2018-2019.

Figure 11. Annual Incidence Rate of Reported Work-Related Pesticide Poisoning Cases (per 100,000 employed), NYS, US 2009-2017



Data Source: America's Poison Centers (APC)

References:

1. Calvert GM, Plate DK, Das R, Rosales R, Shafey O, Thomsen C, Males D, Beckman J, Arvizu, E, Lackovic M. Acute occupational pesticide-related illness in the US, 1998-1999: Surveillance findings from the SENSOR-pesticides program. Am J Ind Med. 2004; 45:114-23.

Technical Notes:

- Work-related pesticide poisoning cases were identified based on the following criteria:
  – Reason for call was occupational OR the exposure site was the workplace; AND
  – Medical outcome is one of the following: minor effect; moderate effect; major effect; death; not followed, minimal clinical effects possible; or unable to follow, judged as potentially toxic exposure; AND
  – Exposure to an agent included in one of the generic pesticide categories: disinfectants, fungicides (non-medicinal), fumigants, herbicides (includes algicides, defoliants, desiccants, plant growth regulators), insecticides (includes insect growth regulators, molluscicides, nematicides), repellents, or rodenticides. For detail listing of the pesticide generic categories see the 2018 Occupational Health Indicators: A Guide for Tracking Occupational Health Conditions and Their Determinants (pages 71 –74).
- Includes employed persons aged 16 years or older.
- Excludes cases that are out-of-state residents OR where the exposure site occurred at the workplace AND reason for call was suspected suicide, intentional abuse, intentional action but specific intention unknown, malicious, or unknown reason.
- Criteria for inclusion has changed over time, therefore comparisons by year are not advised.
- Annual incidence rates of reported cases of work-related pesticide poisoning are presented per 100,000 employed persons aged 16 years or older in Figure 11. Rates are calculated by using the number of cases from PCCs and the estimated number of employed persons from the *Geographic Profile of Employment and Unemployment*, which is based on the Current Population Survey.

Limitations:

- Data based on information from poison control centers (PCCs) are subject to certain limitations:
  – Only a small portion of acute occupational pesticide-related illness cases (approximately 10%) are captured by PCCs.
  – PCCs do not systematically collect information on industry and occupation.

Indicator 12: Incidence of Malignant Mesothelioma, Ages 15 and Older

Malignant mesothelioma is a rare but highly fatal cancer of the thin membranes surrounding the chest cavity (pleura) or abdominal cavity (peritoneum). Much less frequently, this tumor affects other anatomical sites (e.g., pericardium). The only well-established risk factor for mesothelioma is exposure to asbestos fibers. Prior asbestos exposure, primarily from exposure in the workplace, has been reported in 62 to 85 percent of all mesothelioma cases.[1] Mesothelioma is a disease of long latency, typically with 20-40 years between exposure and onset of disease.

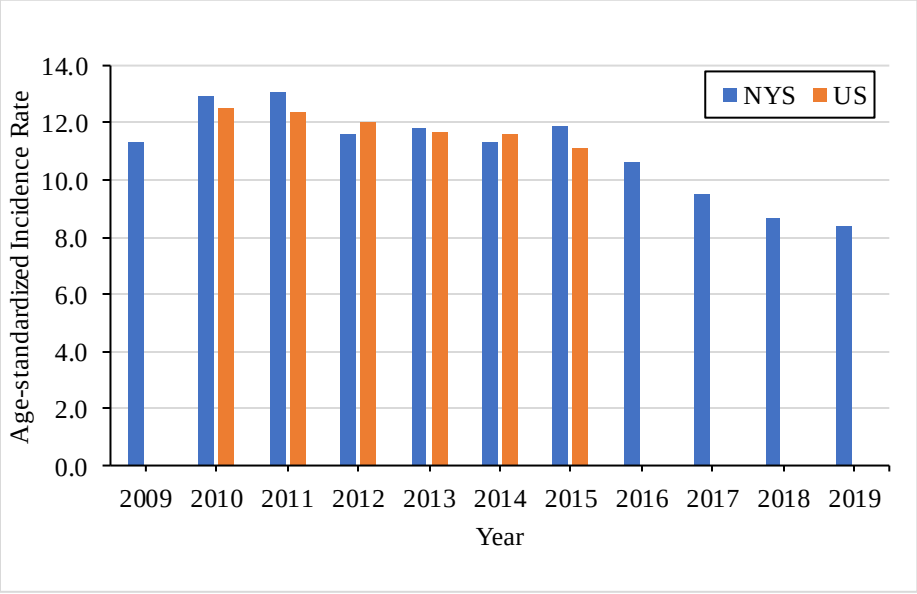
There were 2,146 incident mesothelioma cases reported in NYS from 2009 to 2019. The incidence rate was highest in 2011 (13.1 per 1,000,000 residents), which exceeded the highest US rate (12.4).

Table 12. Annual Number of Incident Mesothelioma Cases, NYS, US, 2009-2019

YEAR	NYS	US
2009	206	N/A
2010	207	2,850
2011	222	3,108
2012	198	3,109
2013	209	3,114
2014	199	3,127
2015	198	3,098
2016	195	N/A
2017	185	N/A
2018	168	N/A
2019	159	N/A

Note: N/A: Data for US was unavailable for 2016-2019.

Figure 12. Annual, Age-Standardized Mesothelioma Incidence Rate (per 1,000,000 residents) aged 15 years and older, NYS, US, 2009-2019



Data Sources: State Cancer Registries and North American Association of Central Cancer Registries (NAACCR) Incidence - Cancer in North America (CiNA) Production File.

References:

1. Albin, M, Magnani, C, Krstev, S, Rapiti, E, and Shefer, I. Asbestos and cancer: An overview of current trends in Europe. Environ Health Perspect. 1999; 107(2): 289-298.

Technical Notes:

- Includes persons aged 15 years or older.
- Malignant mesothelioma cases are assessed by a histology code of ICD-O from 9050 - 9053.
- This indicator excludes cases with unknown age, out-of-state residents, and unknown residence.
- Age-standardized incidence rates are expressed as cases per one million residents and are based on the 2000 US Standard Population and the Census Bureau's Population Estimates.

Limitations:

- State cancer registries are subject to several limitations:
  – Causes of death listed on the death certificate may be inaccurate.
  – The number of contributing cases of death listed on the death certificate may vary by person completing the death certificate and geographic region.
  – Not all cases of malignant mesothelioma are caused by occupational exposures.
  – Decedent's state of residence may not have been the same as the state of exposure.
- Malignant mesothelioma is a disease of long latency. Furthermore, current incidence is not indicative of current exposures. Therefore, it may be many years before reductions in occupational exposures affect incidence.
- Because the guidance offered for the OHIs differs from the methodology used by State Cancer Registries, incidence rates calculated using the OHI How-To Guide may differ from those published by State Cancer Registries.

Indicator 13: Elevated Blood Lead Levels (BLL) Among Adults

Lead poisoning among adults is primarily due to occupational exposure. Lead adversely affects multiple organ systems and can cause permanent damage. Exposure to lead in adults can cause anemia, nervous system dysfunction, kidney damage, hypertension, decreased fertility, and miscarriage. Workers bringing lead dust home on their clothing can expose their children to lead.

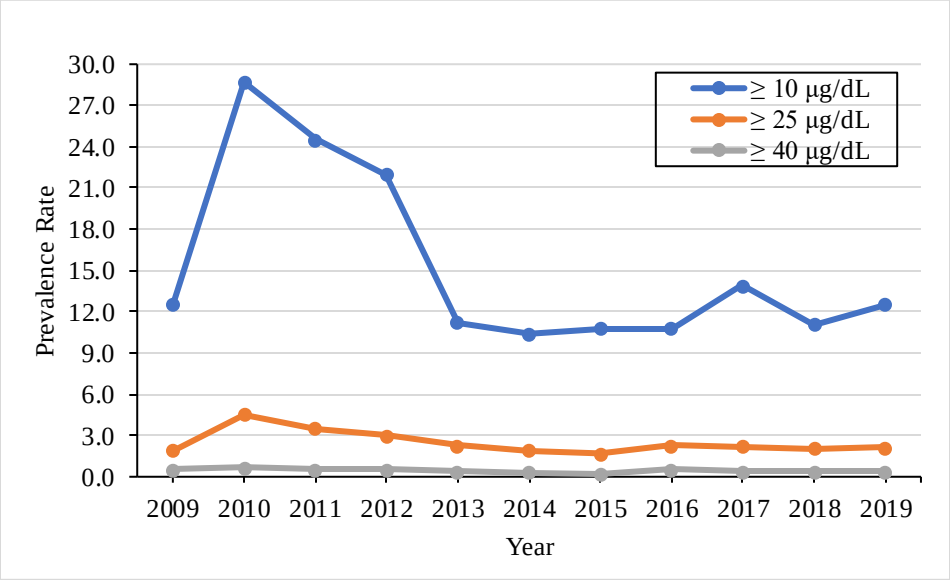
The blood lead level (BLL) is the best biological indicator of recent lead exposure. A BLL of 25 micrograms per deciliter (µg/dL) or greater for adults is considered "elevated," and the Healthy People 2010 goal is to eliminate BLLs above this level.[1] The federal Occupational Safety and Health Administration (OSHA) requires that employers regularly monitor the BLLs of workers where airborne lead in the workplace exceeds certain levels. When a worker's BLL is 40 µg/dL or greater, the employer is required to offer an annual medical exam and other medical interventions depending on the BLL. However, adverse health effects have been found with cumulative exposure at BLLs lower than 40 µg/dL[2] and 25 µg/dL.[3]

There were 16,517 cases aged 16 years or older with BLL ≥ 10 µg/dL, 2,799 cases with BLL≥ 25 µg/dL, and 859 cases with BLL≥ 40 µg/d during 2009-2019. (Table 13). The highest incidence rates for BLL above 10 µg/dL, 25ud/dL and 40ug/dL were reported in 2010 (Figure 13). The increase in incident cases in 2010 may likely be from increased awareness and subsequent testing for heavy metals.

Table 13. Annual Number of Incident Cases with Elevated Blood Lead Levels among NYS residents ages 16 years and older, 2009-2019

YEAR	BLL ≥ 10 µg/dL	BLL≥ 25 µg/dL	BLL≥ 40 µg/dL
2009	2,554	403	64
2010	2,708	526	103
2011	2,136	308	49
2012	1,918	260	46
2013	1,005	202	39
2014	929	172	25
2015	989	159	20
2016	986	205	43
2017	1,295	204	34
2018	857	166	36
2019	1,140	194	40

Figure 13. Annual Incidence Rate (per 100,000 employed), of Blood Lead Levels among those ages 16 years and older, NYS, 2009-2019



Data Sources: New York State Adult Blood Lead Epidemiology and Surveillance (ABLES) Program, Bureau of Labor Statistics' *Geographic Profile of Employment and Unemployment*, Current Population Survey (CPS) and Local Area Unemployment Statistics (LAUS) Program

References:

1. U.S. Department of Health and Human Services. Healthy People 2010. 2nd edition. Washington DC. US Government Printing Office. November 2000. Objective 20-7. (https://www.cdc.gov/nchs/data/hpdata2010/hp2010_final_review.pdf)
2. Rosenman KD, Sims A, Luo Z, Gardiner J. Occurrence of lead-related symptoms below the current Occupational Safety and Health Act allowable blood lead levels. J Occup Environ Med. 2003; 45:546-555
3. Schwartz J. Lead, blood pressure and cardiovascular disease in men. Arch Environ Health. 1995; 50:31-37.

Technical Notes:

- An elevated blood lead level (BLL) is defined as a blood lead concentration of ≥5 five micrograms per deciliter (µg/dL) of whole blood, in a venous blood sample.
- A prevalent case (new plus old case) is a person with an elevated blood lead level greater than or equal to the listed level who was reported at least once in the calendar year. An incident case (new case) is a person with an elevated blood lead level greater than or equal to the listed level who was reported in the calendar year, but not in the immediately preceding calendar year.
- Cells with fewer than 5 cases are not published.
- The numerator includes persons aged 16 or older regardless of employment; the denominator includes only employed persons.
- Annual prevalence rates of BLLs are presented per 100,000 employed persons aged 16 years or older in Figure 13. Rates are calculated by using the number of cases identified from the ABLES Program and the estimated number of employed persons from the *Geographic Profile of Employment and Unemployment*, which is based on the Current Population Survey.
  – Rates are not calculated for number of cases <5.

Limitations:

- Data from the Adult Blood Lead Epidemiology and Surveillance (ABLEs) program are subject to certain limitations:
  – Blood lead levels (BLLs) reflect the contributions of acute external exposure to lead as well as the release of internal bone lead stores into the blood. For persons with significant body burden, a single BLL may not be an accurate indicator of recent external exposure, as lead is also being released into the blood from bone stores.
  – Even with a reporting requirement for NYS, data from laboratories are frequently incomplete.
  – Many workers with significant occupational lead exposure are not appropriately tested. Some workers may not be tested using appropriate methods.
  – An individual's lead exposure and BLL testing may be done in the same or in different states. These states may not reflect individual's state of residence.
  – Approximately 10–15% of elevated BLLs among adults can be caused by non-occupational exposures.

Indicator 14: Workers Employed in Industries at High Risk for Occupational Morbidity

Workers aged 16 years and older in certain industries sustain non-fatal injuries and illnesses at much higher rates than the overall workforce.

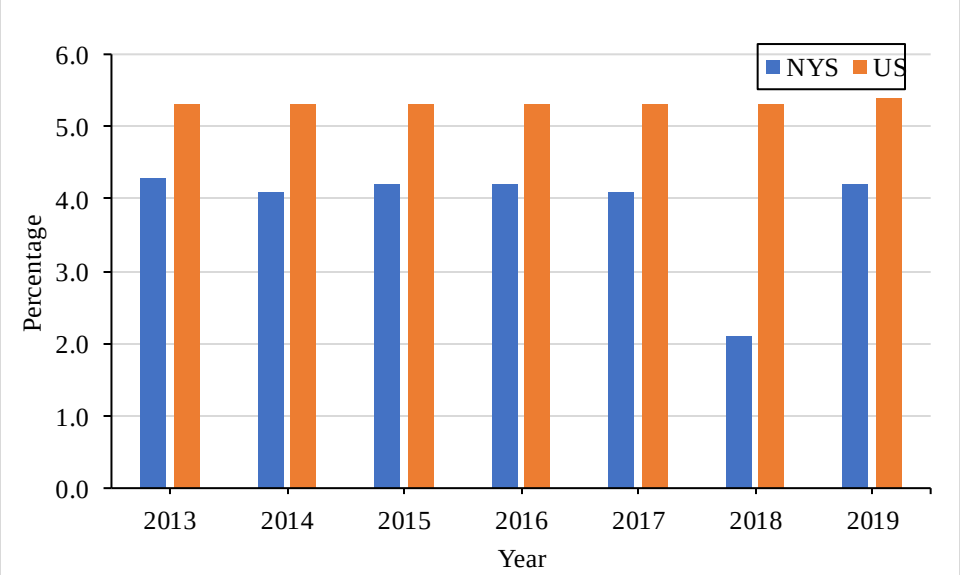
The highest number of workers aged 16 years and older employed in high-risk occupational morbidity industries was reported in 2019 (Table 14). The percentage of employed persons in high-risk industries in NYS was highest (4.3) in 2013 (Figure 14). The percentage of those employed in high-risk industries in NYS remained consistently lower than the national rate from 2013 to 2019.

Table 14. Number of Employed Persons in High Morbidity Risk North American Industry Classification System (NAICS) Industries, NYS, US, 2013-2019

YEAR	NYS	US
2013	335,095	6,308,407
2014	322,404	6,409,798
2015	338,989	6,584,237
2016	343,255	6,682,275
2017	340,235	6,849,952
2018	347,055	6,919,798
2019	361,822	7,207,687

Note: The classification for high-risk morbidity industries changed 2013 onwards and should not be compared to data prior to 2013. Thus, data from 2009 through 2012 been excluded for this indicator.

Figure 14. Percentage of Employed Persons in High Morbidity Risk NAICS Industries, NYS, US, 2013-2019



Data Source: Census Bureau's County Business Patterns

Technical Notes:

- The Census Bureau's County Business Patterns (CBP) is based on mid-March payrolls of all employers. Excludes farms, public administration, or self-employed. CBP data are extracted from the Business Register, the Census Bureau's file of all known single and multi-establishment companies. Data comes from a variety of sources, including the Economic Census, the Annual Survey of Manufactures, and Current Business Surveys, as well as from administrative records of the Internal Revenue Service (IRS), the Social Security Administration (SSA), and the Bureau of Labor Statistics (BLS)."
- Includes employed persons aged 16 years or older.
- The high-risk morbidity industries are based on BLS “total reportable cases incidence rates” for private sector workers for the year 2014 from the Bureau of Labor Statistics Annual Survey of Occupational Injuries and Illnesses.

– 54 industries are classified as "high risk" because they had occupational injury and illness rates more than double the national rate of 6.4 cases per 100 full-time-equivalent workers.
– The list of "high risk" industries is found in the 2018 Occupational Health Indicators: A Guide for Tracking Occupational Health Conditions and Their Determinants (instructions for indicator 14), available at:
https://cdn.ymaws.com/www.cste.org/resource/resmgr/occupationalhealth/OHI_GuidanceManual_2018_FINA.pdf

Limitations:

- Differences in regional industrial practices may cause the ranking of "high risk" industries within NYS to differ from those identified from national data.
- Exact employment counts for a particular North American Industrial Classification System (NAICS) may not be provided within a state because of confidentiality issues.

Indicator 15: Workers Employed in Occupations at High Risk for Occupational Morbidity

Occupations that have at least twice the national rate of total reportable injuries and illnesses as classified as high risk. Workers aged 16 years and older in certain occupations sustain non-fatal injuries and illnesses at much higher rates than the overall workforce. Since the overall injury and illness rates have declined over time, the criteria rate for defining a 'high risk' occupation (at least twice the overall rate) has also declined. The composition of the Bureau of the Census occupations that comprise "high risk" have changed from the group of occupations that were used to generate data prior to 2013. From 2013 through 2019, there were 49 "high risk" occupations, found in the 2018 Occupational Health Indicators: A Guide for Tracking Occupational Health Conditions and Their Determinants. Since data from 2009 through 2012 should not be compared to data from 2013 forward, it has been excluded from this indicator.

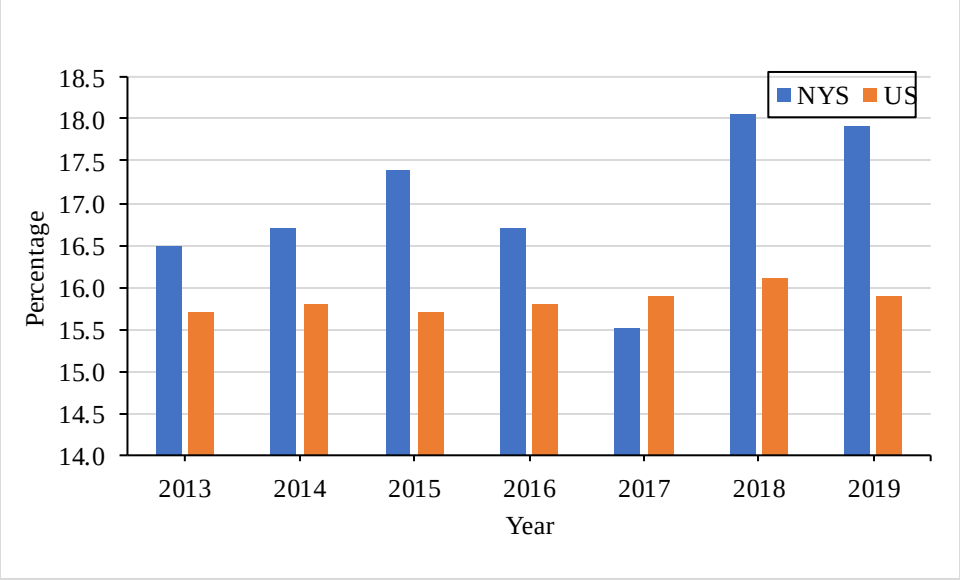
The percentage of NYS employed persons aged 16 years and older in high morbidity risk occupations was the highest in 2018. (Figure 15) The NYS rate exceeded the US rate consistently for all years except 2017.

Table 15. Number of Employed Persons in High Morbidity Risk Bureau of the Census (BOC) Occupations, NYS, US, 2013-2019

YEAR	NYS	US
2013	1,108,715	17,053,040
2014	1,132,551	17,605,210
2015	1,199,295	17,778,497
2016	1,140,032	18,256,349
2017	1,083,782	18,595,396
2018	1,267,579	19,223,091
2019	1,250,971	19,226,635

Note: The classification for high-risk morbidity occupations changed 2013 onwards and should not be compared to data prior to 2013. Thus, data from 2009 through 2012 been excluded for this indicator.

Figure 15. Percentage of Employed Persons in High Morbidity Risk BOC Occupations, NYS, US, 2013-2019



Data Source: Bureau of Labor Statistics' (BLS) Current Population Survey (CPS)

Technical Notes:

- The National Institute for Occupational Safety and Health's (NIOSH) Employed Labor Force (ELF) query system (https://wwn.cdc.gov/wisards/cps) was used to calculate the number of workers employed in high-risk occupations. The NIOSH ELF is based on the Bureau of Labor Statistic's Current Population Survey.
- The CPS is a monthly probability sample of households in the United States (https://www.bls.gov/opub/geographic-profile/2015/home.htm).

- Estimates exclude workers less than 16 years of age, active-duty members of the military, and people living in most group institutions (i.e., prisoners, living institutions for the elderly).
- The high-risk morbidity occupations are based on BLS “days away from work” cases and employment estimates for private sector workers for the year 2014 from the Bureau of Labor Statistics Annual Survey of Occupational Injuries and Illnesses.
  – 49 occupations are classified as "high risk" for morbidity because they had an injury/illness rate that was more than double the national rate for all workers. In other words, the occupations had 'Days Away from Work' incidence rates of 195.6 per 10,000 full-time equivalent workers or higher.
  – The latest list of "high risk" occupations is found in the 2018 Occupational Health Indicators: A Guide for Tracking Occupational Health Conditions and Their Determinants (instructions for indicator 15), available at: https://cdn.ymaws.com/www.cste.org/resource/resmgr/occupationalhealth/OHI_GuidanceManual_2018_FINA.pdf

Limitations:

- Differences in regional industrial practices may cause the ranking of "high risk" occupations within NYS to differ from those identified from national data.
- Estimates from CPS published by the BLS may differ slightly compared to the CPS results obtained from ELF due to differences in methods used to apply population controls.

Indicator 16: Workers Employed in Industries and Occupations at High Risk for Occupational Mortality

Workers in certain industries and occupations sustain fatal injuries at much higher rates than the overall workforce. The proportion of the workforce that is employed in these high-risk industries and occupations varies by state.
The composition of the industries and occupations that comprise "high risk" have changed from the group of industries and occupations that were used to generate data prior to 2008. The list of "high risk" industries and occupations are found in the Occupational Health Indicators: A Guide for Tracking Occupational Health Conditions. Data from 2013 onwards is based on 38 high risk mortality industries and 63 high risk mortality occupations because they had a fatality rate more than twice the overall US rate of 3.6 per 100,000 FTE.

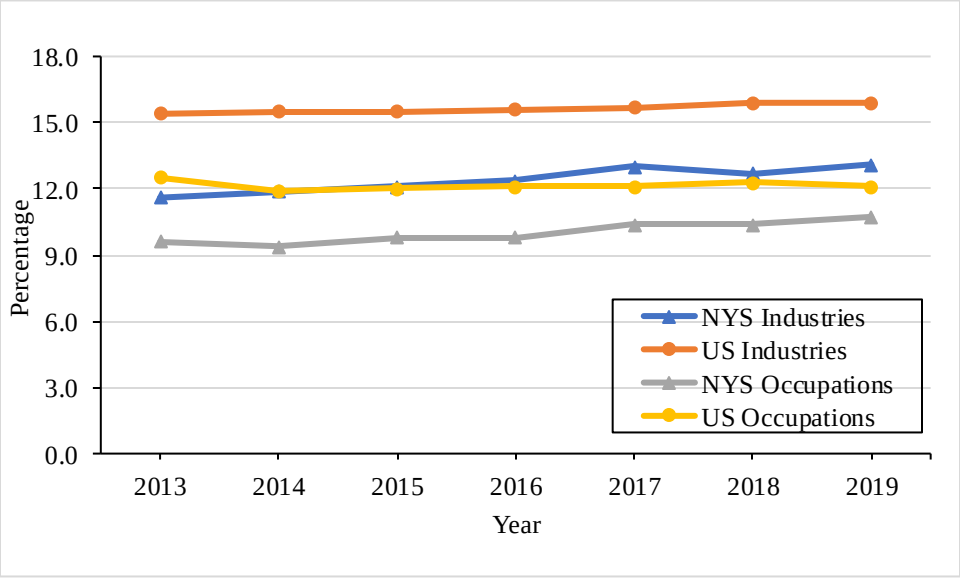
The number of employed persons aged 16 years and older in high mortality risk industries and occupations in NYS increased somewhat consistently from 2009-2019. The percentage of employed persons in high mortality industries (13.1) and occupations (10.7) was highest in 2019 (Figure 16). The percentage for both industries and occupations remained consistently lower in NYS than the US from 2009 to 2019.

Table 16. Number of Employed Persons in High Mortality Risk Bureau of Census (BOC) Industries and Occupations, NYS, US, 2013-2019

YEAR	NYS Industries	US Industries	NYS Occupations	US Occupations
2013	856,551	19,070,007	724,112	15,442,987
2014	909,197	19,579,754	909,197	15,023,126
2015	944,888	19,880,868	760,124	15,398,847
2016	960,602	20,367,099	760,113	15,769,868
2017	1,016,913	20,734,540	815,243	16,074,574
2018	1,005,387	21,428,666	819,355	16,538,157
2019	1,023,440	21,700,771	837,429	16,573,425

Note: The classification for high-risk mortality industries and occupations changed 2013 onwards and should not be compared to data prior to 2013. Thus, data from 2009 through 2012 been excluded for this indicator.

Figure 16. Percentage of Employed Persons in High Mortality Risk BOC Industries and Occupations, NYS, US, 2013-2019



Data Source: Bureau of Labor Statistics' Current Population Survey

Technical Notes:

- The National Institute for Occupational Safety and Health's (NIOSH) Employed Labor Force (ELF) query system (https://wwwn.cdc.gov/wisards/cps/) was used to calculate the number of workers employed in high-risk occupations. The NIOSH ELF is based on the Bureau of Labor Statistic's Current Population Survey.
- The CPS is a monthly probability sample of households in the United States (https://www.bls.gov/opub/geographic-profile/2015/home.htm).
- Estimates exclude workers less than 16 years of age, active-duty members of the military, and people living in most group institutions (i.e., prisoners, living institutions for the elderly).
- The high-risk mortality industries are based on the Bureau of Labor Statistics' Census of Fatal Occupational Injuries (CFOI) for private sector workers 16 years of age or older for the year 2014.
  – 38 industries are classified as "high risk" for mortality because they had a fatality rate more than twice as high as the overall U.S. rate of 3.6 per 100,000 FTE in 2014.
- The high-risk mortality occupations are based on the Bureau of Labor Statistics' Census of Fatal Occupational Injuries (CFOI) for private sector workers 16 years of age or older for the year 2014.
  – 63 occupations are classified as "high risk" for mortality because they had a fatality rate more than twice as high as the overall U.S. rate of 3.6 per 100,000 FTE in 2014.
- The list of "high risk" industries and occupations is found in the 2019 document, "Occupational Health Indicators: A Guide for Tracking Occupational Health Conditions and Their Determinants (instructions for indicator 16), available at: https://cdn.ymaws.com/www.cste.org/resource/resmgr/occupationalhealth/OHI_GuidanceManual_2019_FINA.pdf

Limitations:

- Differences in regional industrial practices may cause the ranking of "high risk" occupations within NYS to differ from those identified from national data.
- Estimates from CPS published by the BLS may differ slightly compared to the CPS results obtained from ELF due to differences in methods used to apply population controls.

Indicator 17: Occupational Safety and Health Professionals

Occupational safety and health (OSH) professionals share the common goal of identifying hazardous conditions or practices in the workplace and helping employers and workers reduce the risks imposed by such conditions. It is important to assess the availability of such personnel to implement occupational health preventive services in the states. In a 2000 report, the Institute of Medicine estimated that approximately 75,000 to 125,000 Americans are active or eligible members of professional societies representing core OSH disciplines of occupational safety, industrial hygiene, occupational medicine, and occupational health nursing.[1]

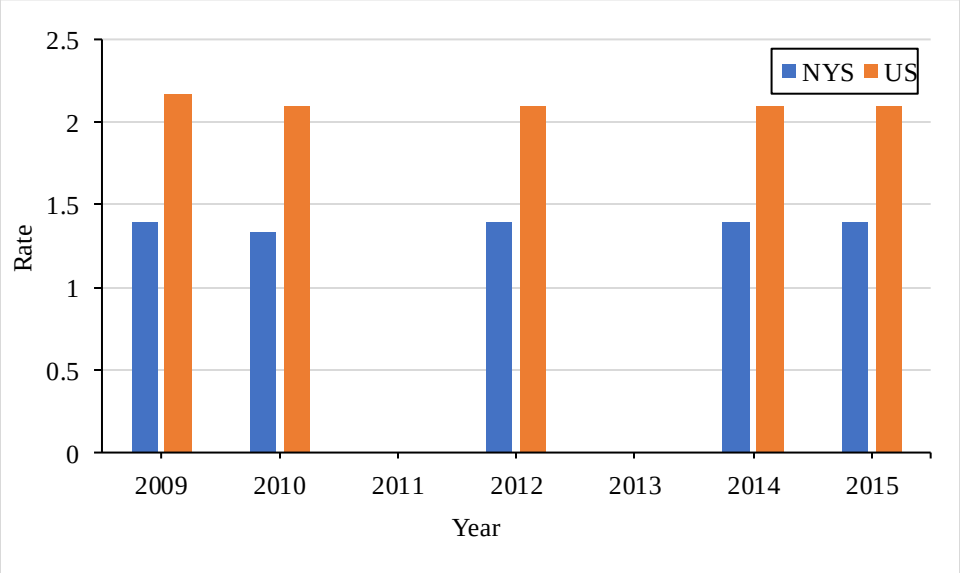
There were 126 board-certified occupational physicians in NYS in 2009 and 2015. The rate of board-certified occupational physicians remained somewhat consistent at 1.4 per 100,000 physicians from 2009 to 2015 (Figure 17) and was lower than the US rate for all the five years the data was collected.

Table 17. Number of Board-Certified Occupational Physicians by Year, NYS, US, 2009-2015

YEAR	NYS	US
2009	126	2,159
2010	119	2,922
2011	N/A	N/A
2012	120	2,974
2013	N/A	N/A
2014	124	3,064
2015	126	3,082

Note: N/A: Data was not collected for NYS and US in 2011, 2013 and for 2016-2019.

Figure 17. Rate (per 100,000 FTEs), of Board-Certified Occupational Medicine Physicians NYS, US, 2009-2015



Data Sources: Number of health professionals: Current membership rosters of cited health and safety professional organizations. Employment statistics used to calculate rates: Bureau of Labor Statistics' Current Population Survey.

References:

1. Institute of Medicine. Safe Work in the 21st Century: Education and Training Needs for the Next Decade's Occupational Safety and Health Personnel. 2000

Technical Notes:

- Counts of safety and health professionals may include retired individuals and individuals who devote the majority of their ti me to research and have limited or no time for provision of actual preventive services.
- An individual may practice part-time or even full-time in the field of occupational health and not be board-certified or a member of an organization representing occupational health professionals.

- The completeness and frequency of updating addresses varies by each organization. Members are often listed in a database by a preferred address, which may not be the address where they practice.

Indicator 18: OSHA Enforcement Activities

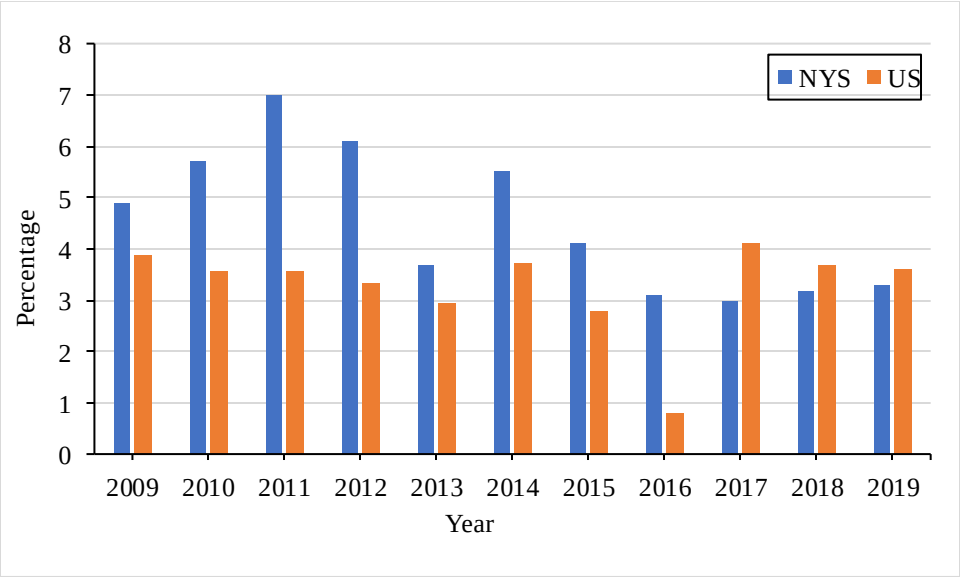
The Occupational Safety and Health Act of 1970 was passed by Congress to assure safe and healthy working conditions for every working man and woman in the nation. Under the Act, OSHA is authorized to conduct worksite inspections to determine whether employers are complying with health and safety standards issued by the agency. OSHA may issue citations and impose fines on employers if violations are found. OSHA inspects worksites in response to reports of fatal injuries or incidents resulting in multiple hospitalizations, worker complaints, and referrals from other agencies. OSHA also conducts programmed inspections aimed at specific high-risk industries, occupations, or worksites with high injury rates. Federal OSHA jurisdiction includes federal employment but does not extend to state and municipal government workplaces.[1]

The percentage of OSHA covered establishments inspected in NYS during 2009-2019 was between 0.6-1.0% annually. The percentage of employees eligible for inspection whose work areas were inspected by OSHA was highest in 2011 (Figure 18). From 2009 to 2016, the NYS percentage exceeded the US percentage, followed by a decrease, making it lower than the US from 2017 to 2019.

Table 18. Percentage of OSHA-Covered Establishments Eligible for Inspection that were Inspected by OSHA, NYS, US, 2009-2019

YEAR	NYS Percentage	US Percentage
2009	1.0	1.2
2010	1.0	1.1
2011	0.9	1.1
2012	1.0	1.0
2013	1.0	1.0
2014	0.7	0.9
2015	0.7	0.9
2016	0.6	0.8
2017	0.7	0.8
2018	0.7	0.8
2019	0.7	0.8

Figure 18. Percentage of OSHA-Covered Employees Eligible for Inspection Whose Work Areas were Inspected by OSHA, NYS, US, 2009-2019



Data Sources: Occupational Safety and Health Administration (OSHA) Annual Inspection Reports and Bureau of Labor Statistics' Covered Employers and Wages (ES-202/QCEW)

References:

1. United States Department of Labor. Occupational Safety and Health Administration. All About OSHA. OSHA Coverage. Federal Government Workers. 2023. https://www.osha.gov/sites/default/files/publications/all_about_OSHA.pdf

Technical Notes:

- US numbers are for private sector only.
- Mines and private households are not covered (and thus not inspected) by OSHA.

Limitations:

- This indicator measures enforcement activity only. It does not measure other OSHA activities such as education and compliance assistance.
- OSHA may conduct multiple inspections of the same establishment during the calendar year. Thus, the percentage of establishments inspected, and the number of workers covered may be slightly overestimated.
- In federal OSHA states and some OSHA state plan states, OSHA does not inspect farms with 10 or fewer employees. Agricultural establishments are excluded from the denominator in this indicator except for a few states; therefore, the percentages of establishments and employees covered may be overestimated where smaller farms are inspected.
- Employers participating in an OSHA Voluntary Protection Program (VPP), or the Safety and Health Achievement and Recognition Program (SHARP) are exempt from routine inspections. Excluding workers from these programs will reduce the numerator, resulting in an underestimate of the protective function.

Indicator 19: Workers' Compensation Awards

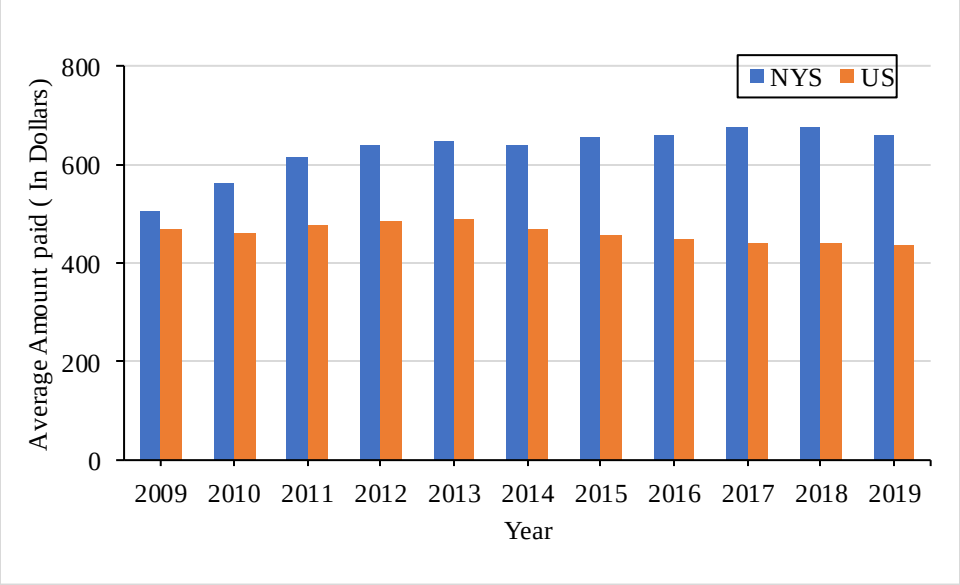
Workers' compensation was first implemented in the US in 1911 in nine states and in 1914 in NYS. This state-based social insurance program was developed to provide guaranteed compensation for workers with work-related injuries or illnesses while limiting the liability exposure of employers. Workers' compensation provides benefits to partially replace lost wages and pay for medical expenses associated with a work-related injury or illness. In case of a death, the worker's dependents are eligible for survivor benefits.

The total amount of workers' compensation benefits paid in NYS increased annually from $4.1 million in 2009 to $6.1 million in 2019. In 2017, the workers compensation system paid $678, the highest average amount per covered worker for the time-period (Figure 19). This amount was higher than the average amount paid for the US worker from 2009 to 2019.

Table 19. Total Amount (in dollars) of Workers' Compensation Benefits Paid, NYS, US, 2009-2019

YEAR	NYS (in Dollars)	US (in Dollars)
2009	4,146,728	58,326,816
2010	4,606,295	57,541,639
2011	5,097,055	60,210,113
2012	5,394,509	61,856,754
2013	5,543,750	63,574,440
2014	5,581,295	62,306,736
2015	5,803,753	61,856,542
2016	5,964,217	61,918,340
2017	6,191,035	61,865,768
2018	6,285,571	62,859,707
2019	6,192,450	63,045,970

Figure 19. Average Amount of Workers' Compensation Benefits Paid per Covered Worker, NYS, US, 2009-2019



Data Source: National Academy of Social Insurance

Technical Notes:

- "Covered" workers are those who are eligible for compensation should they sustain work-related injuries or illnesses.
- Federal employees, railroad workers, long shore and maritime workers may not be covered by state workers' compensation systems.

Limitations:

- Workers' compensation data are subject to several limitations:
  – Workers' compensation data are not complete for a variety of reasons. Many individuals with work-related illnesses and many with work-related injuries do not file for workers' compensation. Workers' compensation claims may be denied. Self-employed individuals (e.g. farmers, independent contractors, and small business owners), corporate executives, domestic and agricultural workers may be exempt from coverage.
  – Compensation award payments are frequently made over time; thus, annual awards may not reflect the full cost of injuries and illnesses for a given year.

Indicator 20: Work-Related Low Back Disorder Hospitalizations

Workers aged 16 years or older hospitalized for work-related back disorders have serious and costly effects including high direct medical costs, significant functional impairment and disability, high absenteeism, reduced work performance, and lost productivity. Well-recognized prevention efforts can be implemented for high-risk job activities and reduce the burden of work-related low back disorders.

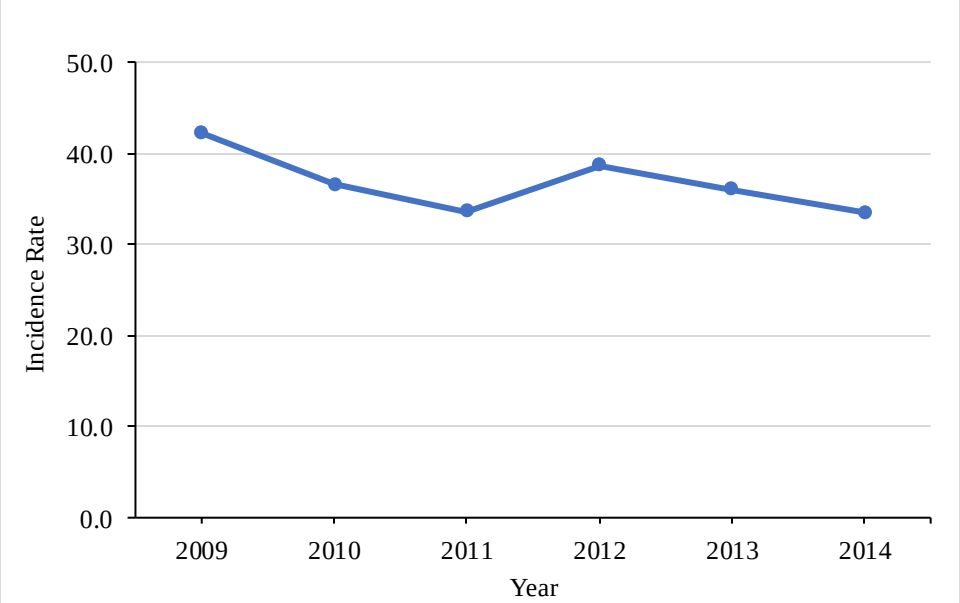
The annual number of low back disorder hospitalizations has generally decreased from 2009-2015, with a high of 3,757 in 2009. (Table 20). The incidence rate of work-related low back disorder hospitalizations was highest in 2009. US data was only available for 2009 and 2010, and the calculated incidence rate was lower than the NYS rate. (Figure 20).

Table 20. Annual Number of Total Work-Related Low Back Disorder (Primary Diagnosis) Hospitalizations for Persons 16 or Older, NYS, 2009-2015

YEAR	NYS
2009	3,757
2010	3,229
2011	2,924
2012	3,384
2013	3,213
2014	2,993

Note: Data was not collected for the 4th quarter of 2015 due to the transition in ICD coding, thus rate for 2015 has been excluded from this indicator

Figure 20. Annual Incidence Rates (per 100,000 workers),of All Work-Related Low Back Disorder (Primary Diagnosis) Hospitalizations NYS, 2009-2014



Data Sources**:** Number of hospitalizations per state: State hospital discharge data. Estimated number of hospitalizations in the U.S.: National Center for Health Statistics' National Hospital Discharge Survey. Employment statistics used to calculate rates: Bureau of Labor Statistics' Current Population Survey.

Technical Notes:

- Includes non-federal, acute care hospitals only.
- Primary payer must be workers' compensation.
  – Self-employed individuals such as farmers and independent contractors, federal employees, railroad, or longshore and maritime workers may not be covered by state workers' compensation systems.
- Estimates include employed persons aged 16 years and older.
- Excludes patients with unknown age, out-of-state residents and unknown residence, and out-of-state inpatient hospitalizations.

- Hospitalizations for work-related surgical low back disorders are identified with a relevant diagnostic code using ICD-9-CM in any of the first seven diagnosis fields in combination with a relevant surgical procedure code in any of the first four procedure fields. The list of diagnostic and surgical procedural codes is found in the 2018 Occupational Health Indicators: A Guide for Tracking Occupational Health Conditions and Their Determinants (pages 123-124)
  – Excludes cases that have an exclusion criterion listed on page 125 of the 2018 Occupational Health Indicators: A Guide for Tracking Occupational Health Conditions and Their Determinants.

Limitations:

- State hospital discharge data are subject to certain limitations:
  – Many individuals with work-related illnesses or injuries do not file for workers' compensation or fail to recognize work as the cause of their illness or injury.
  – Attribution of primary payer in hospital discharge data may not be accurate.
  – All hospital admissions are counted, including multiple admissions for a single individual.

Indicator 21: Asthma Among Adults Caused or Made Worse by Work

Asthma is a chronic inflammatory disease of the airways that affects more than 18 million adults in the US.[1] Work-related asthma is a term used to describe asthma that has a temporal association between asthma symptoms and the work environment. [2,3] It has been estimated that approximately 36-58% of adult asthma is caused or made worse by workplace exposures, which translates to approximately 9.7 million adults in the US.[4-7] However, work-related asthma continues to be underdiagnosed.[3,5,6] If diagnosed early, work-related asthma may be partially or completely reversible if exposures can be identified and properly stopped or controlled.[3]

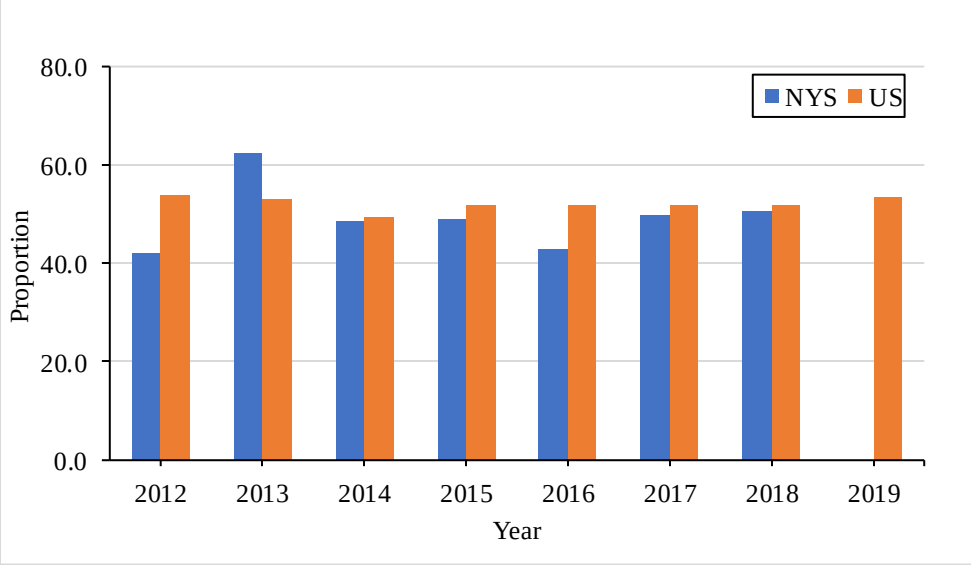
The highest number and proportion were reported in 2013 (Table 21 and Figure 21), which was also the only year the NYS rate exceeded the national rate. This indicator included data for landlines and cellphone estimates combined from 2012 to 2018.

Table 21. Annual Number of Ever-Employed Adults with Current Asthma Who Report that their Asthma was Caused or Made Worse by Exposures at Work (landline & cellphone estimates), NYS, US, 2012-2019

YEAR	NYS	US
2012	559,017	6,636,275
2013	1,065,741	7,884,871
2014	830,599	6,703,447
2015	796,834	6,460,686
2016	656,855	8,054,104
2017	676,037	8,054,104
2018	835,332	8,114,831
2019	N/A	7,186,806

Note: Data based on landline and cellphone sampling methodology started getting collected 2012 onwards, so data from 2009-2011 has been excluded for this indicator.
N/A: Data was not collected for NYS in 2019

Figure 21. Proportion of Ever-Employed Adults with Current Asthma who Report that their Asthma was Caused or Made Worse by Exposures at Work (landline & cellphone estimates), NYS, US, 2012-2019



Data Sources: Centers for Disease Control and Prevention (CDC), Behavioral Risk Factor Surveillance System (BRFSS), Asthma Call-back Survey (ACBS)

References:

1. Centers for Disease Control and Prevention. National Health Interview Survey (NHIS), National Center for Health Statistics. Current asthma prevalence; 2010.
2. Vandenplas O, Malo J-L. Definitions and types of work-related asthma: a nosological approach. Eur Respir J 2003; 21: 706–712.

3. Tarlo SM, Balmes J, Balkissoon R, et al. Diagnosis and Management of Work-Related Asthma: ACCP Consensus Statement. Chest 2008; 134: 1S-41S.
4. Knoeller GE, Mazurek JM, Moorman JE. Work-Related Asthma Among Adults with Current Asthma in 33 States and DC: Evidence from the Asthma Call-Back Survey, 2006–2007. Public Health Rep 2011; 126; 603-611.
5. American Thoracic Society Statement: Occupational Contribution to the Burden of Airway Disease. Am J Resp Crit Care Med 2003; 167: 787-797.
6. Henneberger PK, Redlich CA, Callahan DB, Harber P, Lemière C, Martin J, Tarlo SM, Vandenplas O. An Official American Thoracic Society Statement: Work-Exacerbated Asthma. Am J Resp Crit Care Med 2011; 184:368-378.
7. Lutzker LA, Rafferty AP, Brunner WM, Walters JK, Wasilevich EA, PhD, Green MK, Rosenman KD. Prevalence of Work-Related Asthma in Michigan, Minnesota and Oregon. J Asthma 2010; 47:156-161.

Technical Notes:

- The ACBS is a telephone health survey of the non-institutionalized U.S. population. Individuals must have a telephone to participate. It is also only conducted in select languages which can vary by state; therefore, it does not include individuals who speak all languages.
- Weighted estimate of the number of ever-employed adults with current asthma who report that their asthma was caused or made worse by exposures at work is based on landline and cellphone sampling methodology.
- Includes ever-employed adults (18 years or older) with current asthma.

Limitations:

- This indicator does not distinguish between new-onset asthma and work-aggravated asthma.
- The US estimate represents a combined estimate and may not be representative of all 50 states, the District of Columbia, and U.S. territories.

Indicator 22: Work-Related Severe Traumatic Injury Hospitalizations

Acute work-related trauma is a leading cause of death and disability for US workers. In 2010, more than 4,500 US workers died from occupational injuries.[1] Severe traumatic injury can lead to long-term pain and disability and is very costly for workers' compensation systems and society. The total national medical and productivity cost for occupational injuries was recently estimated at $192 billion annually. [2]

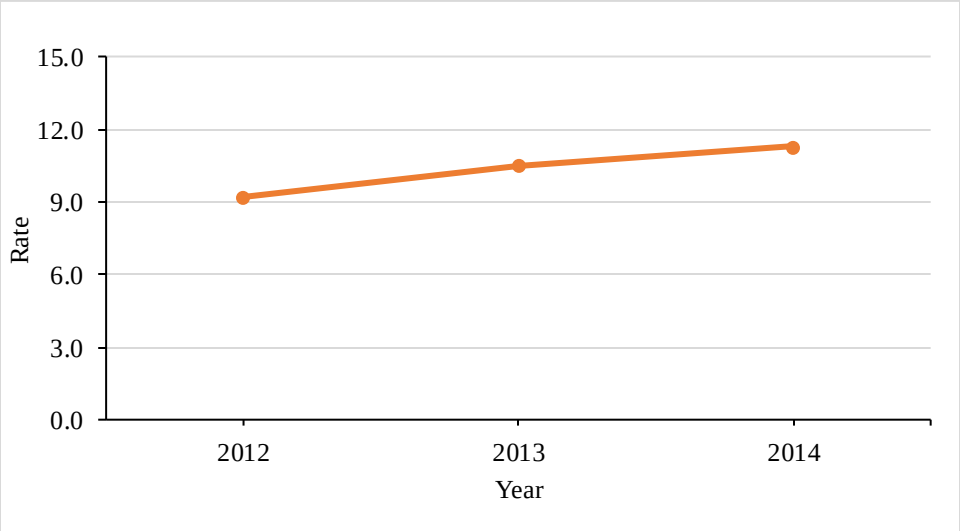
Data was collected only for 2012 to 2014. In 2012, the rate of work-related severe injury hospitalizations among workers aged 16 years and older was 9.2, followed by 10.5 in 2013 and 11.3 in 2014, indicating an increase in the number and rate of hospitalizations.

Table 22. Annual Number of Work-Related Severe Traumatic Injury Hospitalizations, NYS, 2012-2015

YEAR	NYS
2012	805
2013	936
2014	1,014

Note: Data was collected from 2012 to 2014

Figure 22. Annual Rate (per 100,000 workers) of Work-Related Severe Traumatic Injury Hospitalizations



Data Sources: State Inpatient Hospital Discharge Data, Bureau of Labor Statistics' *Geographic Profile of Employment and Unemployment,* Current Population Survey (CPS)

References:

1. National Institute for Occupational Safety and Health (NIOSH). Workplace Safety and Health Topics: Traumatic Occupational Injuries. 2012. https://archive.cdc.gov/#/details?url=https://www.cdc.gov/niosh/injury/default.html
2. Leigh, J. P. Economic burden of occupational injury and illness in the United States. The Milbank Quarterly. 2011; 89(4), 728-772.

Technical Notes:

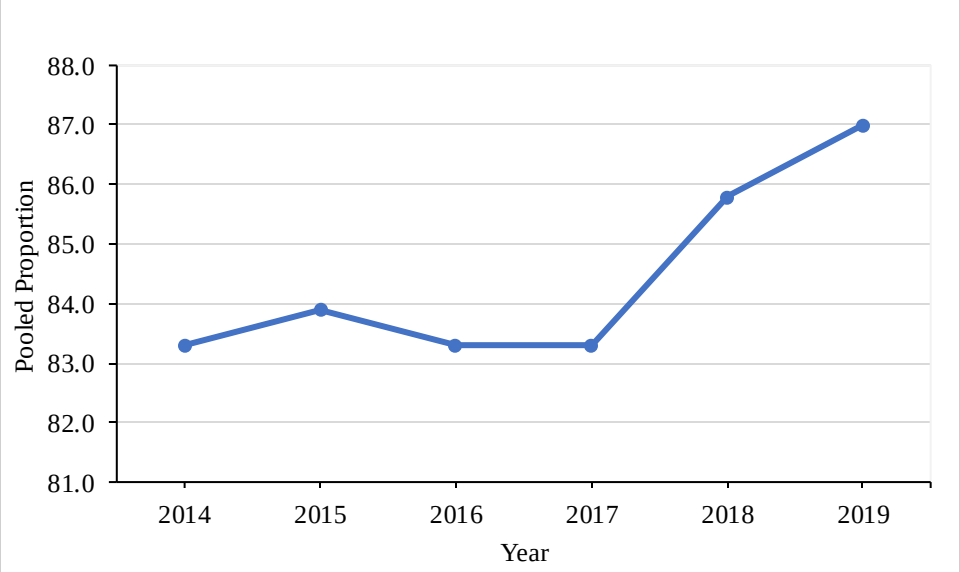
- Includes non-federal, acute care hospitals only.
- Primary payer must be workers' compensation.
  – Self-employed individuals such as farmers and independent contractors, federal employees, railroad, or longshore and maritime workers may not be covered by state workers' compensation systems.
- Estimates include employed persons aged 16 years and older.
- Excludes patients with unknown age, out-of-state residents and unknown residence, and out-of-state inpatient hospitalizations.
- Annual rates of hospitalizations are calculated by using the number of inpatient hospitalizations and the Bureau of Labor Statistics' *Geographic Profile of Employment and Unemployment*, which is based on Current Population Survey (CPS) estimates.

Indicator 23: Influenza Vaccine Coverage Among Hospital Care Personnel

Influenza has long been recognized as a significant cause of morbidity and mortality, especially among vulnerable populations[1]. Healthcare personnel can serve as vectors for influenza because they are at risk for acquiring influenza from patients and for transmitting it to patients, and because they often come to work when ill.[2-5]Nosocomial influenza outbreaks in healthcare facilities result in longer stays and greater mortality for patients[6-8] and missed work for HCP[5].The CDC recommends that all HCP receive the seasonal influenza vaccine annually to protect themselves and their patients[1].

This indicator includes the pooled proportion vaccinated among employees, licensed independent practitioners, adult students/trainees, and volunteers combined in NYS. The proportion was 83.3 in 2014 and peaked to 87.0 in 2019 (Figure 23).

Figure 23. Pooled Proportion of Hospital Care Personnel Influenza Vaccination Coverage in Acute Care Hospitals, NYS, 2014-2019



Note: Data was collected for this indicator from 2014 onwards.

Data Source: Centers for Disease Control and Prevention, Healthcare Safety Network

References:

1. Fiore AE, Shay DK, Broder K, Iskander JK, Uyeki TM, Mootrey G, Bresee JS, Cox, NJ. Prevention and control of seasonal influenza with vaccines: recommendations of the Advisory Committee on Immunization Practices (ACIP), 2009. MMWR Recomm Rep 2010; 58 (RR08): 1-52.
2. Talbot TR, Bradley SF, Cosgrove SE, Ruef C, Siegel JD, Weber DJ. Influenza vaccination of healthcare workers and vaccine allocation for healthcare workers during vaccine shortages. Infect Control Hosp Epidemiol 2005; 26: 882-90.
3. Talbot TR, Dellit TH, Hebden J, Sama D, Cuny J. Factors associated with increased healthcare worker influenza vaccination rates: results from a national survey of university hospitals and medical centers. Infect Control Hosp Epidemiol 2010; 31: 456-62.
4. Pavia AT. Mandate to protect patients from health care-associated influenza. CID 2010; 50: 465-67.
5. Wilde JA, McMillan JA, Serwint J, et al. Effectiveness of influenza vaccine in healthcare professionals: a randomized trial. JAMA 1999; 281: 908–913.
6. Cunney RJ, Bialachowski A, Thornley D, Smaill FM, Pennie RA. An outbreak of influenza A in a neonatal intensive care unit. Infect Control Hosp Epidemiol. 2000; 21:449-454.
7. Bridges CB, Kuehnert MJ, Hall CB. Transmission of influenza: implications for control in health care settings. Clin Infect Dis 2003; 37: 1094–1101.
8. Weinstock DM, Eagan J, Malak SA, et al. Control of influenza A on a bone marrow transplant unit. Infect Control Hosp Epidemiol. 2000; 21:730-732.

Technical Notes:

- Includes all who received an influenza vaccination administered at the healthcare facility, or reported in writing (paper or electronic), or provided documentation that an influenza vaccination was received elsewhere.

Indicator 24: Occupational Heat-Related Emergency Department (ED) Visits

Exposure to environmental heat is a recognized hazard for many occupations, including firefighting, farm work, mining, warehouse labor, utilities maintenance, manufacturing, and disaster response, where individuals are not able to maintain thermal equilibrium due to environmental conditions, required clothing type, physical exertion, and use of protective equipment.[1-5] In 2010, approximately 3,470 private sector workers experienced a nonfatal work-related illness (e.g. heat stroke) due to environmental heat exposure which required days away from work. Workers suffering from heat-related illness are at higher risk of other occupational injuries due to neurological impairment.

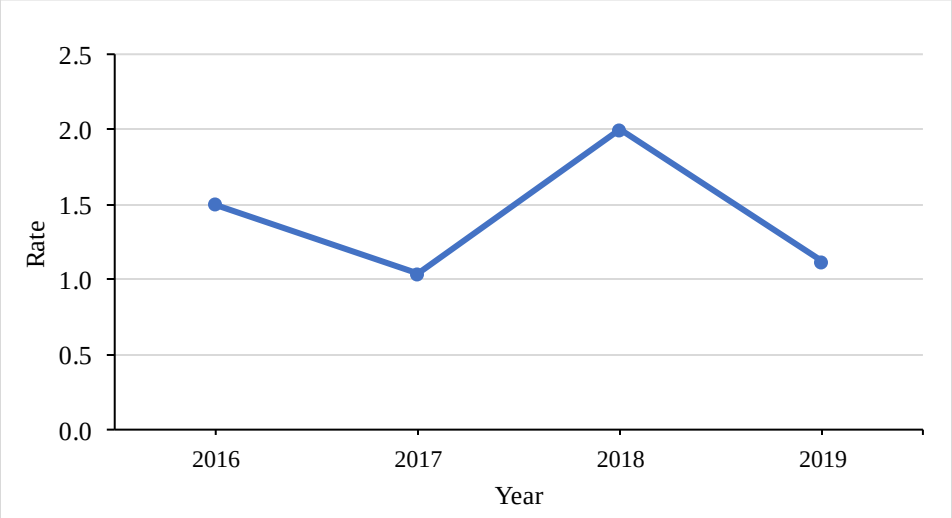
Heat-related ED hospitalizations were identified using the ICD-9-CM codes through 09/30/2015, followed by ICD-10-CM codes from 10/01/2015 and thereafter. 2015 hospitalization data used both ICD-9-CM and ICD-10-CM codes and this transition in classification of hospitalizations between ICD-9-CM and ICD-10-CM may not be a one-to-one match. Thus, we consider the transition from the ICD-9-CM to the ICD-10-CM a break-in series. Any comparisons prior to or to years after 2015 is not advised. The NYS occupational ED visit rate (per 100,000 FTEs) among employed persons aged 16 years and older was 1.5 in 2016 and 1.1 in 2019 (Figure 24).

Table 24. Annual Number of Emergency Department Visits for Occupational Heat-Related Illness, NYS, 2016-2019

YEAR	NYS
2016	137
2017	95
2018	151
2019	102

Note: Data was not collected for the 4th quarter of 2015 due to the transition in ICD coding, thus rate for 2015 has been excluded for this indicator. Data was not available for US.

Figure 24. Annual Rate (per 100,000 employed) of Emergency Department Visits for Occupational Heat-Related Illness among Employed Persons Aged 16 years, NYS, 2016-2019



Data Sources: State Emergency Department Data. Bureau of Labor Statistics' *Geographic Profile of Employment and Unemployment,* Current Population Survey (CPS)

References:
1. Brearley M and Walker A. Water immersion for post incident cooling of firefighters; a review of practical ground cooling modalities. Extreme Physiology and Medicine 2015; 4(15): 1-13.
2. Arcury T, Summers P, Talton J et al. Heat illness among North Carolina Latino farmworkers. Journal of Occupational and Environmental Medicine 2015; 57(12): 1299-1304
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4. Lutz E, Reed R, Turner D, and Littau S. Occupational heat strain in a hot underground metal mine. Journal of Occupational and Environmental Medicine 2014; 56(4): 388-396

5. Meade R, D'Souza A, Krishen L, and Kenny G. The physiological strain incurred during electrical utilities work over consecutive work shifts in hot environments: A case report. Journal of Occupational and Environmental Hygiene 2017; 14(12): 986-994.

Technical Notes:

- The case definition for this indicator was modified for 2016 and subsequent years. Prior to 2016, the indicator excluded hospitalized cases, but in 2016 and later it includes hospitalized cases. Additionally, in 2016 external cause of injury codes were discontinued and replaced with a series of 14 place of injury or external cause of morbidity codes (Y and Z codes in ICD-10-CM)
- Self-employed individuals such as farmers and independent contractors, railroad or longshore and maritime workers may not be covered by state workers' compensation systems.
- Includes employed persons aged 16 years or older.
- Excludes patients with unknown age, out-of-state residents, and unknown residence.
- New York State data includes all ED visits regardless of disposition.
- Annual rates of ED visits presented in Figure 24 are calculated by using the number of ED visits and the Bureau of Labor Statistics' *Geographic Profile of Employment and Unemployment*, which contains Current Population Survey estimates for state-specific numbers of employed persons.

Limitations:

- ED data are subject to several limitations:
  – Many individuals with work-related illnesses or injuries do not file for workers' compensation or fail to recognize work as the cause of their illness or injury.
  – Attribution of primary payer in ED records may not be accurate.
  – All visits are counted, including multiple admissions for a single individual.
  – Practice patterns and payment mechanisms may affect decisions by health care providers to correctly diagnose occupational heat-related illness and/or to list the condition as a discharge diagnosis.
  – The number of diagnoses listed on discharge summaries may vary by regional practice patterns and by the person completing discharge summaries.

Indicator 25: Hospitalizations for or with Occupational Eye Injuries

Occupational eye injuries are common yet preventable. In severe cases, ocular trauma can lead to lifetime disability. Although protective eyewear can reduce the risk of eye injury, identifying additional risk factors for eye injuries is integral to preventing them.[1] Estimating the burden of occupational eye injuries and associated risk factors can help target prevention activities.

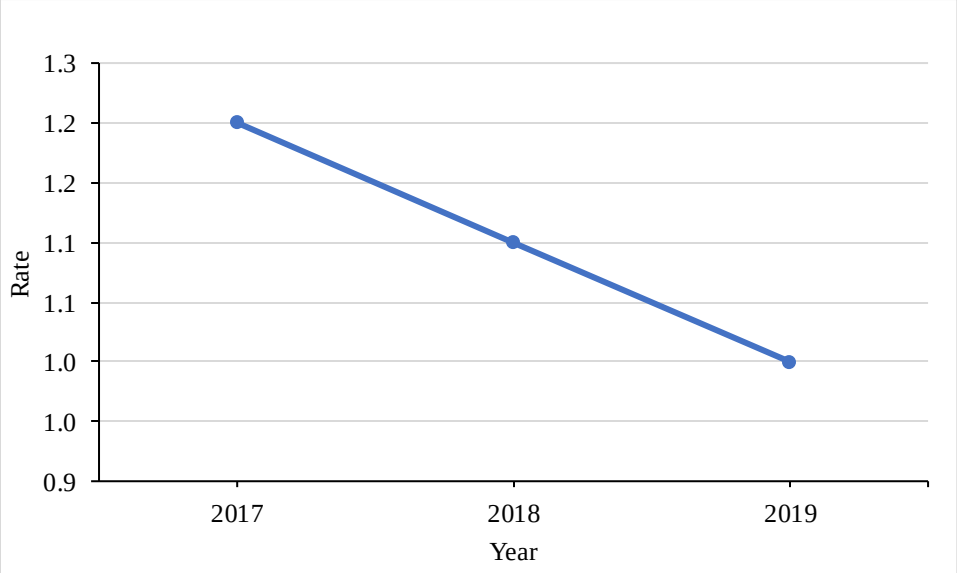
The rate of hospitalizations from occupational eye injuries declined overall starting at 1.2 per 100,000 FTEs in 2017 (Figure 25) to 1.1 in 2018 and was lowest (1.0) in 2019.

Table 25. Annual Number of Inpatient Hospitalizations for Occupational Eye Injuries, NYS, 2017-2019

YEAR	NYS
2017	108
2018	101
2019	88

Note: Data was only collected from 2017 to 2019

Figure 25. Annual Rate (per 100,000 employed) of Inpatient Hospitalizations for Occupational Eye Injuries, Ages 16 Years and Older, NYS, 2017-2019



Data Source: State Inpatient Hospital Discharge Data

References:

1. Blackburn JL, Levitan EB, MacLennan PA, Owsley, McGwin, G. Changes in Eye Protection Behavior Following an Occupational Eye Injury. Workplace Health Saf 2012; 60(9):393-400.

Technical Notes:

- Includes non-federal, acute care hospitals only.
- Primary payer must be workers' compensation.
  – Self-employed individuals such as farmers and independent contractors, railroad or longshore and maritime workers may not be covered by state workers' compensation systems.
- Estimates include employed persons aged 16 years and older.
- Excludes patients with unknown age, out-of-state residents and unknown residence, and out-of-state inpatient hospitalizations.
- Annual rates of hospitalizations presented are calculated by using the number of inpatient hospitalizations and the Bureau of Labor Statistics' *Geographic Profile of Employment and Unemployment*, which is based on Current Population Survey (CPS) estimates for state-specific number of employed persons.
- Hospitalized cases of occupational eye injuries were identified by a series of diagnoses codes. A detailed list of these codes can be found in, "Occupational Health Indicators: A Guide for Tracking Occupational Health Conditions and Their Determinants"

(instructions for indicator 25), available at:
https://cdn.ymaws.com/www.cste.org/resource/resmgr/occupationalhealth/OHI_GuidanceManual_2019_FINA.pdf

Limitations:

- State hospital discharge data are subject to several limitations:
  – Many individuals with work-related illnesses or injuries do not file for workers' compensation or fail to recognize work as the cause of their illness or injury.
  – Attribution of primary payer in hospital discharge data may not be accurate.
  – All hospital admissions are counted, including multiple admissions for a single individual.

Conclusion

Occupational health indicator data can help guide priorities for prevention and intervention efforts. The indicators are intended to be used in conjunction with other guidelines for state-based surveillance of occupational injuries and illnesses[1] and to be used as a complement to overall state and national goals to improve the health of the population. The NYS rates have been lower than the US rates for majority of the indicators with a few exceptions and outliers, indicating that occupational injuries and illnesses in NYS are not abnormally elevated, but the efforts to improve occupational health and prevent work-related injuries and fatalities is a consistent ongoing effort.

References:

1. Council of State and Territorial Epidemiologists. Occupational Health. Indicators. 2017
https://www.cste.org/group/OHIndicators#:~:text=The%20indicators%20are%20intended%20to,the%20population%20(DHHS%202000)