

Background - Occupational Health Indicators in New York State: 2000-2010

Every year, millions of the 135 million workers in the United States (US) are injured on the job or become ill as a result of exposure to health hazards at work. 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.

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 Health¹. 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, 2000 through 2010, the most recent year of compiled data.

Chapter 1 - The Changing New York State Worker Profile: 2000 – 2010

More than nine million individuals work in New York State (NYS). Every year, thousands of these workers are injured on the job or become ill as a result of their working environments. Because of diversity in the workforce, analyzing the demographics and economics of the population is important in understanding the occupational health status of a state. These data are important because workforce characteristics impact rates of work-related injury and illness.

For the most part, NYS saw an increase in the number of employed residents from 2000-2010. In 2008, NYS hit a record high of 9.1 million employed, a 7.2% increase from 2000.² The upward trend in employment ended in 2009-2010 when more than 300,000 individuals left the workforce and employment dropped to an almost five-year low. According to the U.S. Census Bureau, there was a 2.1% increase in the NYS population during the period 2000-2010 (Figure 1.1). The number of older workers (65+ years of age) making up the workforce also increased (3.4% in 2000 to 4.7% in 2010) (Table 1.1). This created a larger civilian labor force competing for jobs in a job market that had not seen similar growth, resulting in an unemployment rate in 2010 (8.5%) that was almost twice the unemployment rate of 2000 (4.6%) (Table 1.1). 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.³

Table 1.1. Employment Status and Change and Worker Characteristics: 2000-2010 in New York State (NYS), New York City (NYC) and Upstate New York (Upstate)

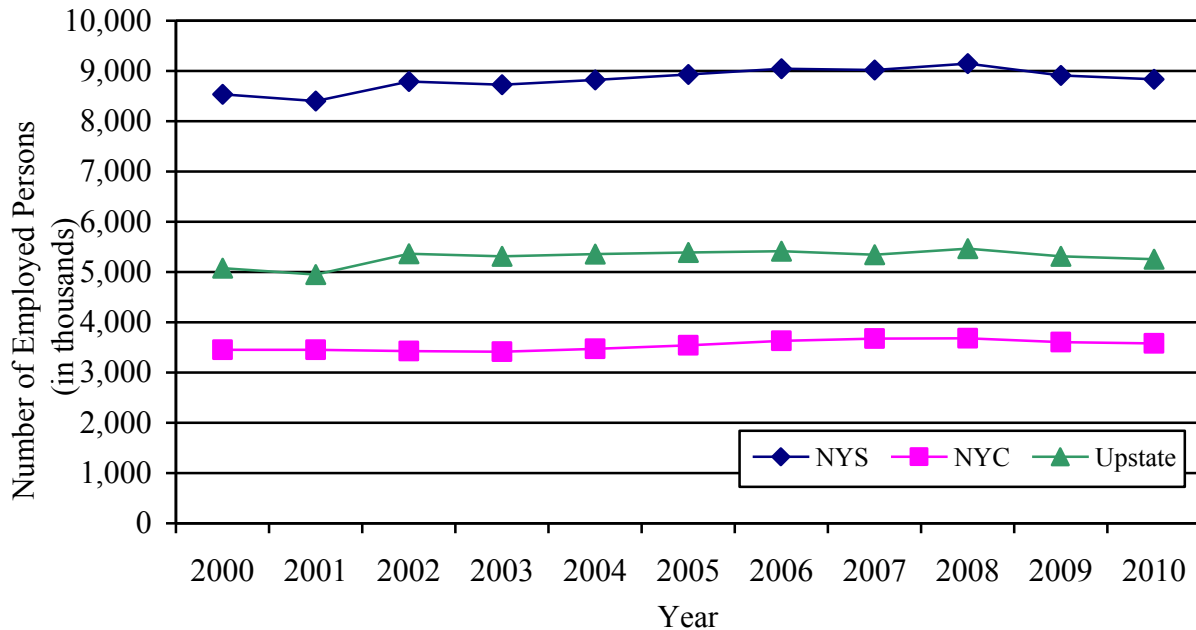
	2000			2010			Difference between all of NYS (p-value)
	NYS	NYC	Upstate	NYS	NYC	Upstate	
Unemployed	4.6%	5.8%	4.1%	8.5%	9.7%	8.5%	0.07
Self-employed	6.2%	6.0%	6.4%	5.9%	6.0%	5.8%	0.39
Part-time	16.8%	13.0%	20.5%	17.9%	12.9%	22.9%	0.29
Hours/week							
<40	35.3%	27.9%	33.6%	35.9%	34.4%	37.3%	0.91
40	37.7%	44.3%	33.5%	43.2%	47.5%	39.2%	0.006*
41+	26.9%	24.4%	28.5%	20.8%	19.9%	21.7%	0.0006*
Gender							
Male	52.8%	52.7%	52.9%	52.0%	52.3%	48.2%	0.46
Female	47.2%	47.3%	47.1%	48.0%	51.9%	47.8%	0.51
Age							
16-17	1.6%	0.7%	2.4%	0.9%	0.5%	1.2%	0.08
18-64	94.9%	96.7%	94.0%	94.5%	95.6%	93.5%	0.63
65+	3.4%	2.5%	3.4%	4.7%	4.4%	5.0%	0.0001*
Race							
White	78.7%	59.9%	90.6%	76.8%	58.2%	82.1%	0.003*
Black	15.0%	28.0%	6.7%	14.7%	25.1%	8.9%	0.39
Other	6.4%	12.1%	32.7%	8.5%	14.9%	4.2%	0.0003*
Hispanic	12.5%	22.9%	5.8%	14.7%	24.7%	7.9%	0.0007*

*Statistically significant difference between years 2000 and 2010

Data source: U.S. Bureau of Labor Statistics. Current Population Survey. Geographic Profiles of Employment and Unemployment.

NYS is comprised of more than 54,000 square miles and is home to more than 19 million people. Because NYS is so large and diverse, not only is there a broad range of industries and occupations such as dairy farming, nanotechnology and manufacturing, there is also a wide spectrum of occupational fatalities, injuries and diseases that occur across the state. This leads to great diversity in the workforce demographics, which is important since worker characteristics can influence the types of injuries and illnesses seen in the working population. It is often useful, for purposes of analysis, to divide the state into two regions: upstate (all regions of the state excluding the five boroughs of New York City) and New York City (NYC). The average annual number of persons employed in NYC over the period 2000-2010 was 3.5 million, while there was an average of 5.3 million workers employed annually in upstate New York (Figure 1.2).

Figure 1.2. Number Employed, New York State, 2000-2010

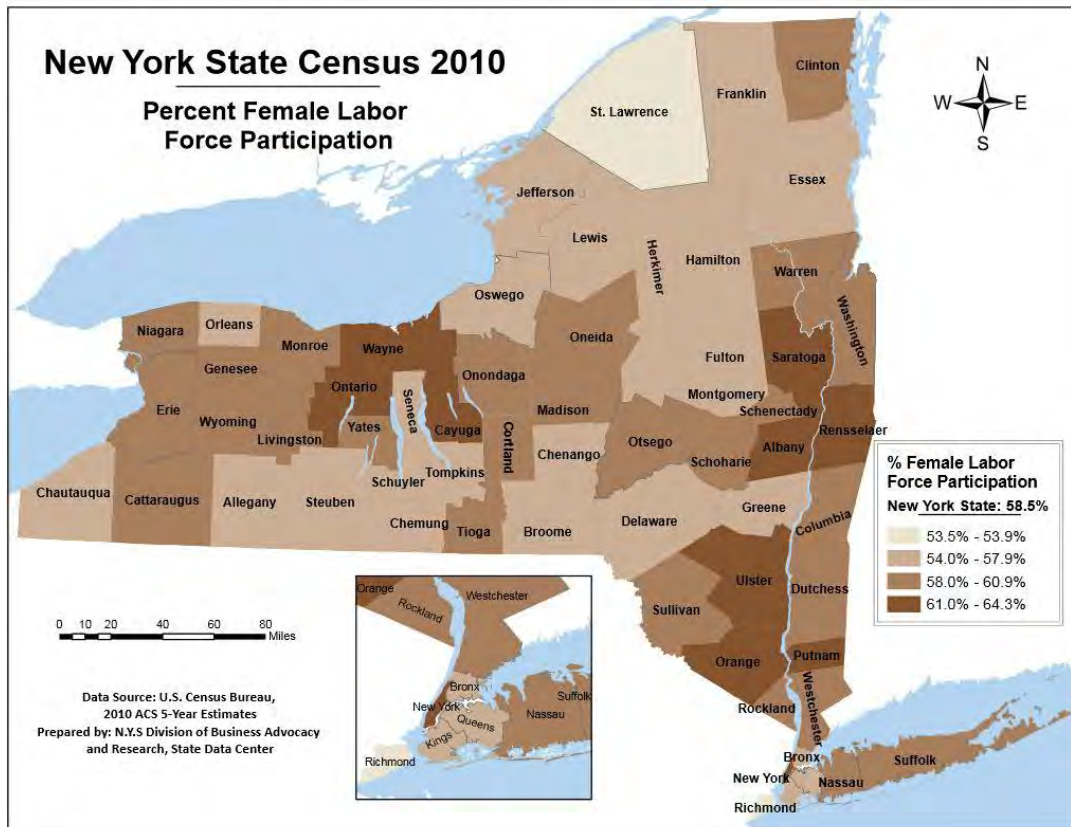


Data source: U.S. Bureau of Labor Statistics. Current Population Survey. Geographic Profiles of Employment and Unemployment.

The number of part-time workers (those persons at work less than 34 hours per week) in NYS has increased over the decade (not statistically significant). Similarly, during 2000-2010, involuntary part-time work has been on the rise throughout most of the U.S.⁴ (data not shown). Fewer workers overall worked part-time in the NYC area; the percentage of part-time workers remained around 13% over the 11-year time period, while in the rest of NYS, the percentage of part-time workers increased from 21% in 2000 to 23% in 2010 (not statistically significant).

Better understanding the gender and age of the working population, is essential to developing effective occupational health and safety prevention programs. Both gender and age can influence the risk of occupational injury and illness. For example, data has shown that men are more likely to be employed in high injury/illness occupations than females.⁵ As seen in Table 1.1, the gender of workers in NYS has remained relatively constant over time and did not vary greatly by geographic location. Figure 1.3 shows the percent female labor force participation by county during 2010. Conversely, the age of NYS workers has shifted over time. There has been a statistically significant increase in older workers, while there has been a decrease in younger workers. This increase in older workers reflects the nationwide trends in the workforce.⁶ The percentage of workers between the ages of 18-64 has remained relatively stable during the 11-year time period. The age trends were the same for the NYC area and rest of NYS (excluding NYC); although a smaller percentage of NYC workers were 16-17 years old and older than 65 years old, as compared to the rest of NYS. The labor force participation rate for older workers has been rising since the late 1990s. Since 2000, the number of employed teens has been on a downward trend.

Figure 1.3. New York State, Percent Female Labor Force Participation, 2010



Race and ethnicity also influence the risk of occupational injury and illness in workers. Some studies have attributed higher rates of injury and illness among minority workers with the greater likelihood of these workers being employed in more hazardous occupations.⁷ It is important to identify at-risk worker populations to reduce the risk of injury and illness. The general trend among NYS workers during 2000 through 2010 has been a statistically significant decrease in the percentage of white workers and a slight decrease in black workers, while there has been a statistically significant increase in those workers included as ‘other’ race (American Indian or Alaska Native, and Native Hawaiian or Pacific Islander) (Table 1.1). The percentage of workers with Hispanic ethnicity has increased significantly over the past decade (Table 1.1). There was a higher percentage of minority workers in the NYC area, although the NYC data showed the same overall trend as the NYS data. The trends in the working population reflect the general trend in New York’s population during the same time period. New York’s racial and ethnic minorities continued to increase as a percentage of its total population between 2000-2010.⁸

As explained earlier, New York 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. The services industry employs almost half of NYS workers. Within the services industry, more than a quarter of

workers are employed in education and health services, with another 8.9% employed in leisure and hospitality. Education and health services had the largest job gains from 2000 to 2010 (data not shown). The retail and wholesale trade employs on average another 13.5% of the workforce although the percentage of retail workers has decreased slightly over time. Manufacturing and transportation, communication and utility industries have undergone significant changes during the eleven year time period. More than eleven percent (11.4%) of workers were employed in manufacturing industries in 2000, while only 6.4% were employed in manufacturing in 2010. The transportation, communication and utilities industries employed 10.3% of the workforce in 2000 and only 8.7% in 2010. Similarly, the agriculture industry in New York has also decreased over time; 1.3% of workers were employed in agriculture in 2000 and only 0.6% were employed in agriculture in 2010. Census data shows that although farm businesses are increasingly consolidating into larger farm units in New York, small part-time farms have actually increased over the past decade.⁹ The construction industry employs around 6.5% of NYS workers and that percentage has not varied greatly during the time period. Both public administration and financial industries have remained stable over time, at approximately 4.9%, and 8.3%, respectively, on average.

Chapter 2 - Elevated Blood Lead Levels Among Adults

Exposure to lead adversely affects multiple organ systems and can cause permanent damage even at lower levels. In adults, exposure to lead can cause anemia, nervous system disruption, kidney damage, hypertension, decreased fertility and miscarriage.¹⁰ Although the adverse health effects from exposure to lead have been recognized for centuries, exposure to lead through occupational, environmental and recreational sources still occurs in New York State (NYS). The blood lead level (BLL) is the best biological indicator of recent lead exposure. Regular surveillance of BLLs allows for early identification of individuals at risk for poisoning. The principle source of lead in adults is primarily occupational exposures, although NYS data indicate that more than 20% of exposures in NYS adult residents are due to non-occupational sources, especially among those individuals with severely elevated BLLs (60+ micrograms per deciliter [mcg/dL]).¹¹ It is important to note that the average BLL for the general population is less than 1.5 mcg/dL.¹²

Data on adults age 16 years old or older comes from the National Institute for Occupational Safety and Health (NIOSH) Adult Blood Lead Epidemiology and Surveillance (ABLES) program. The ABLES program is a state-based surveillance program of laboratory-reported adult blood lead levels. In NYS, the laboratory data are reported through the Heavy Metals Registry (HMR) which reports the data to NIOSH via ABLES. Funding for ABLES was discontinued in 2013, at which time, 41 states reported their data to NIOSH¹³; however, NYS has continued with the collection of this important information. There were 25 states participating in the ABLES program in 2000 while 40 states participated in 2010.

Over 4,100 adults reported to the HMR in 2000 had BLLs 10 mcg/dL or higher. As demonstrated in Figure 2.1, the number of reports has steadily decreased with the low occurring in 2009 with only slightly more than 1,900 people reported. Even with a slight rise in testing numbers and elevated BLLs during 2010, which was most likely due to the increase in transportation and infrastructure jobs funded by the American Recovery and Reinvestment Act of 2009,¹⁴ this decrease in reports of elevated BLLs over time is statistically significant (p value <.0001). Likewise, the number of adults reported with BLLs 25 mcg/dL or higher (p-value <.0001) and 40 mcg/dL (p-value <.0001) or higher has decreased over time. (Figure 2.1)

Figure 2.1. Annual Number of New York State Residents with Elevated Blood Lead Levels , 2000-2010

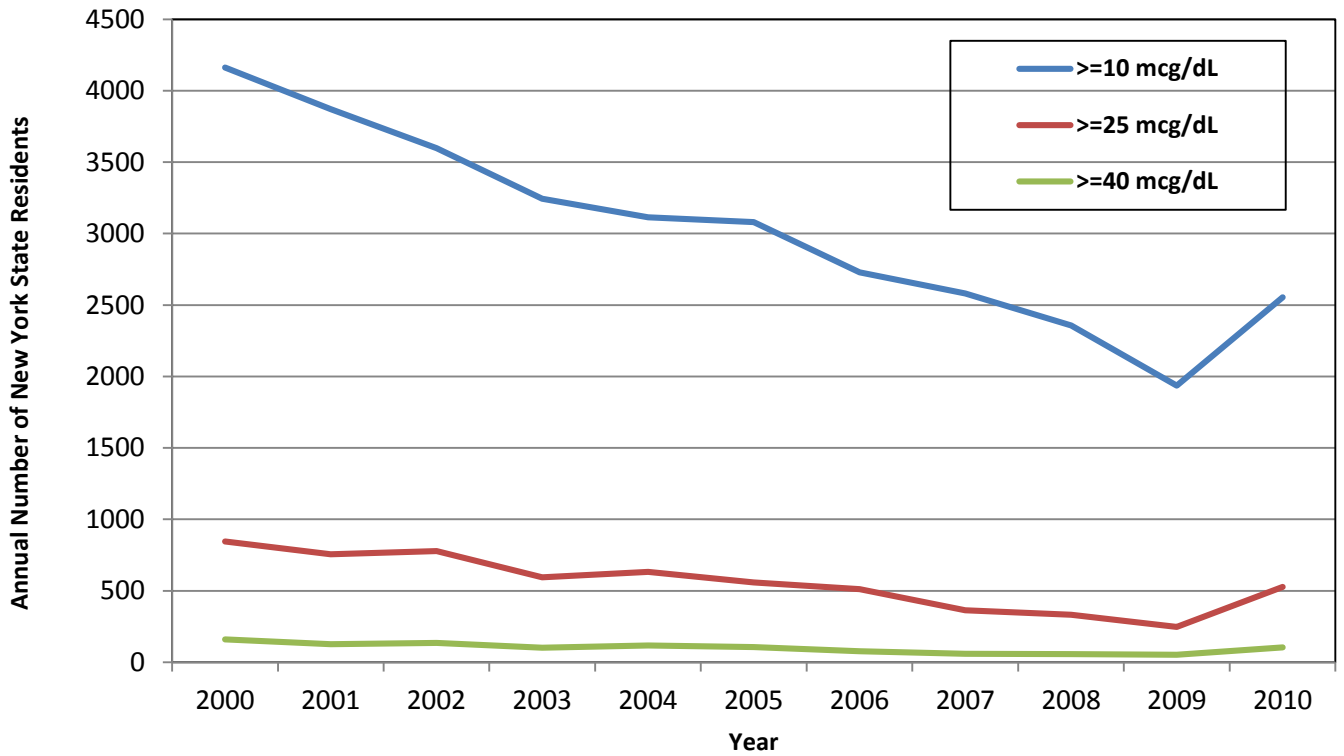
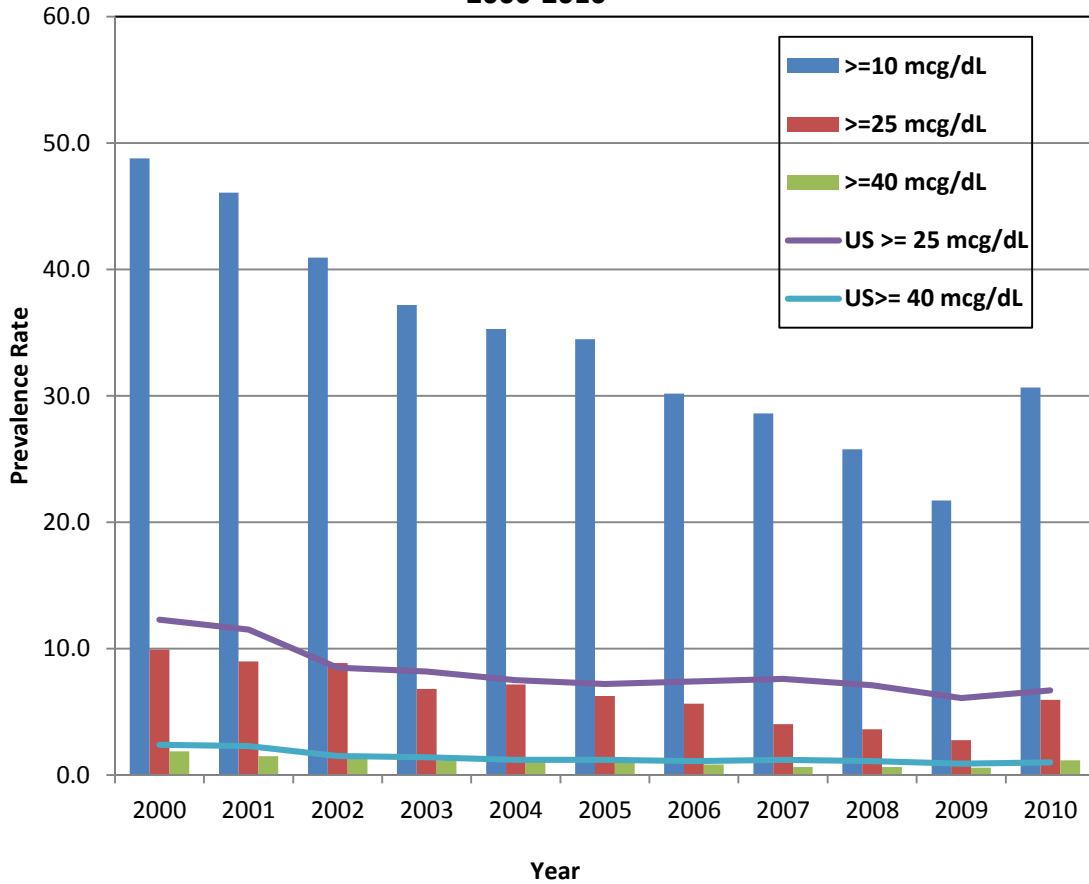


Figure 2.2 shows the annual prevalence rates per 100,000 employed persons of BLLs at or greater than 10 mcg/dL, 25 mcg/dL and 40 mcg/dL among persons 16 years or older residing in NYS. The prevalence rates per 100,000 employed persons of BLLs at or greater than 25 mcg/dL and 40 mcg/dL among all states participating in the ABLES program (represented by the US lines) is also shown in Figure 2.2. The year 2010 was the first year that the CDC/NIOSH included BLLs of 10 mcg/dL or higher in their case definitions of elevated BLLs so only 25 mcg/dL and 40 mcg/dL prevalence rates are shown. The NYS rate of BLLs at or greater than 40 mcg/dL is relatively similar to the rate for the US, however, the NYS rate of BLLs at or greater than 25 mcg/dL is consistently lower than that of the US.

Figure 2.2. Annual Prevalence Rate of Elevated Blood Lead Levels Among New York State Residents, per 100,000 Employed Persons, 2000-2010



Historically, most of the elevated BLLs reported to the HMR were due to occupational exposures. In recent years, however, many more NYS residents have been reported with exposures to lead via non-occupational sources such as target shooting and residential remodeling than in the past. In 2000, there were over 1,900 people with known occupational exposures and only 120 with known non-occupational exposures. (Figures 2.3 and 2.4). Since that time there has been a general decline in the number of reports associated with occupational exposures and a general increase in reports associated with non-occupational exposures. In 2010, only 1,400 people had known occupational exposures but more than 350 had non-occupational exposures. Non-occupational exposures continue to make up a large percentage of the most highly elevated BLLs. While the majority of the reduction in elevated BLLs appears to be due to better mechanisms to control lead exposure in the workplace, other factors may also be involved. The number of NYS companies using lead has decreased as a result of either work process changes to eliminate lead or company closings, following national trends.¹⁵ Another factor in the reduction of elevated BLLs may be the elimination or reduction of biomonitoring by some companies.

Figure 2.3. Number of New York State Residents, with Known Occupational Exposures, by Blood Lead Level Category, 2000-2010

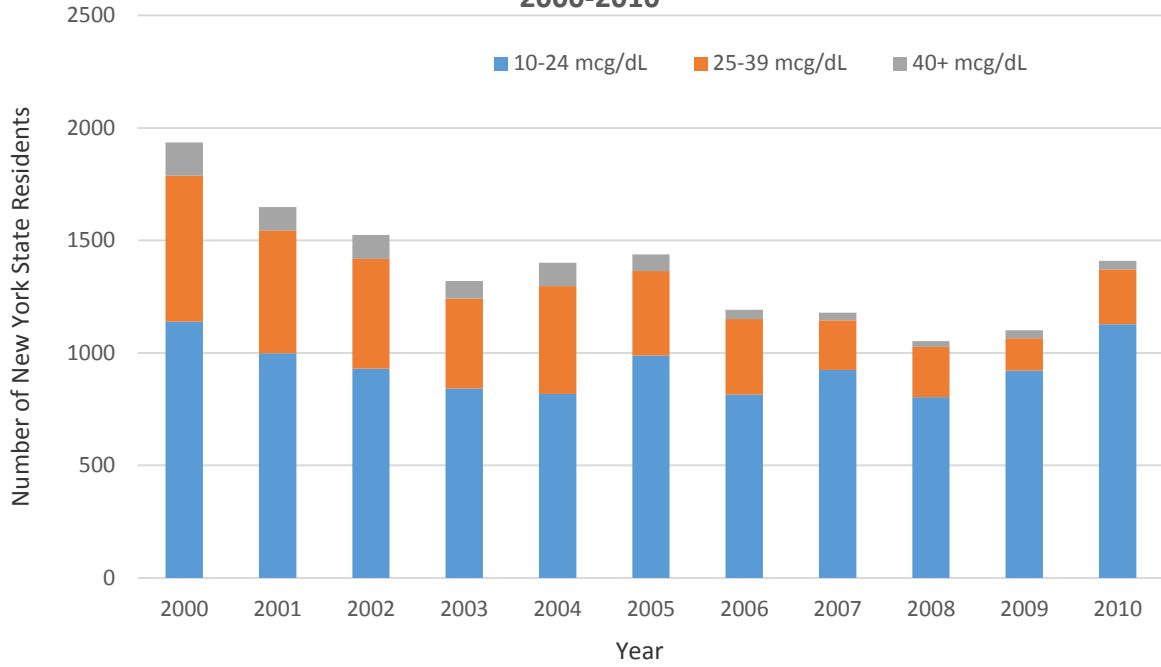
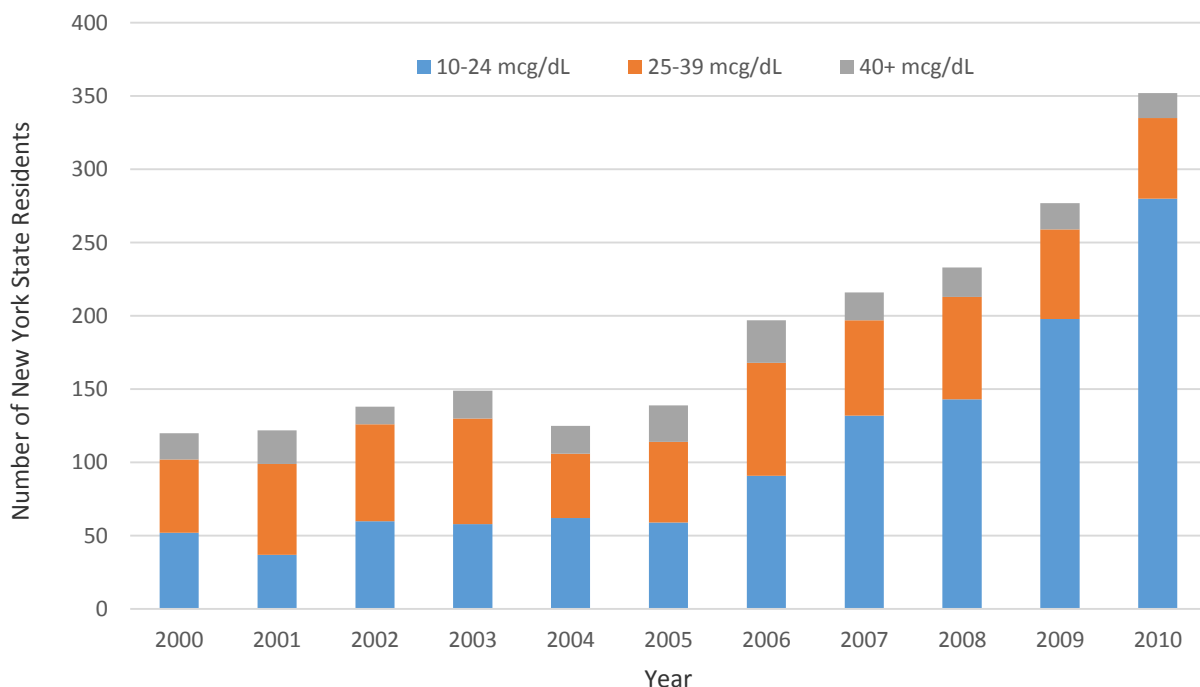


Figure 2.4. Number of New York State Residents, with Known Non-Occupational Exposures, by Blood Lead Level Category, 2000-2010



The types of lead exposures also vary by gender. Women are primarily exposed to lead via non-occupational activities, and the number of known non-occupational exposures among women increased five-fold from 2000 through 2010. There were 36 women in 2000 and 186 women in 2010 exposed to lead from non-occupational sources. (Figure 2.5) The increase in reports among women of childbearing age suggest that women may be receiving prenatal screening for lead. Although NYS does not require blood lead testing for all pregnant women, NYSDOH regulations state that “Prenatal health care providers shall screen or refer for blood lead screening each pregnant woman found to be at risk for current high dose lead exposure.”¹⁶ NYSDOH, in collaboration with the American College of Obstetricians and Gynecologists, has developed “Lead Poisoning Prevention Guidelines for Prenatal Care Providers.”¹⁷ The Guidelines include risk assessment questions for pregnant women. Previous data analysis has shown that the most common sources of non-occupational exposures in NYS include folk remedy usage, target shooting and residential remodeling.¹⁸ An increase in non-occupational exposures over time has also been seen in men; from 83 in 2000 to 166 in 2010, but the primary source of exposure for men remains occupational. (Figure 2.6)

Figure 2.5. Number of New York State Female Residents with a Blood Lead Level ≥ 10 mcg/dL, by Known Exposure Type, 2000-2010

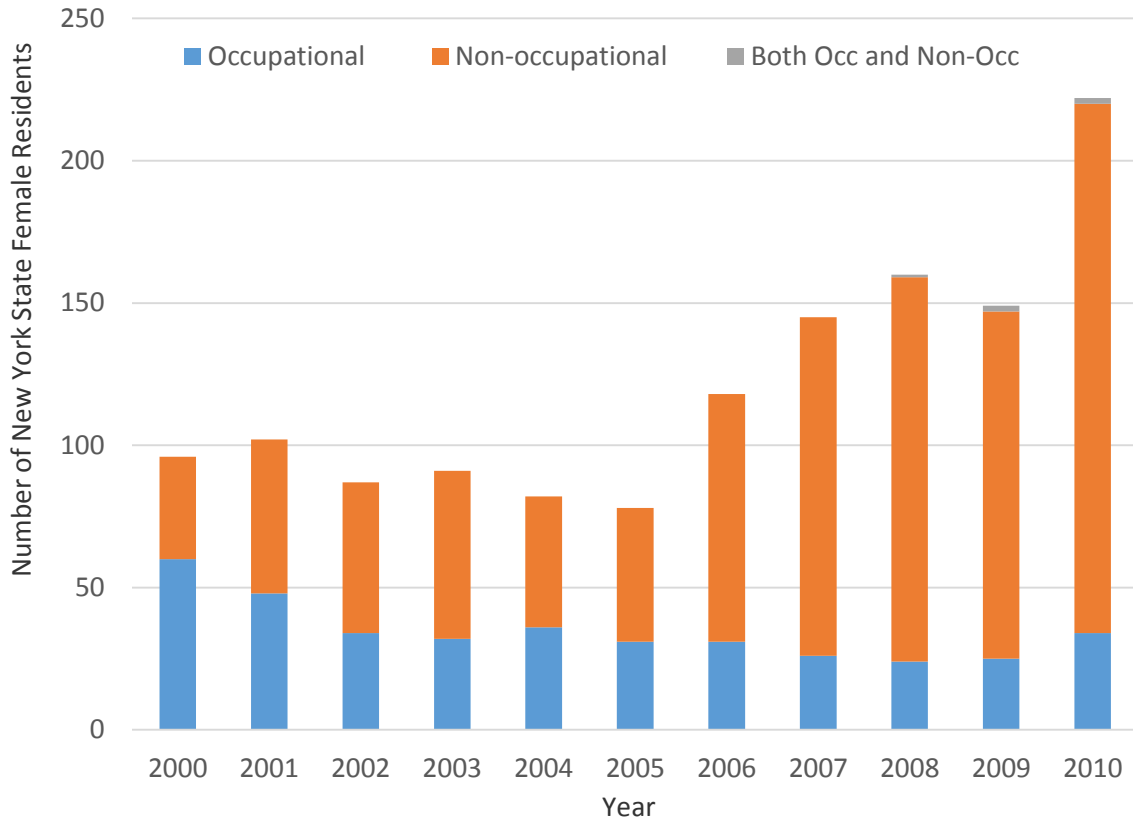
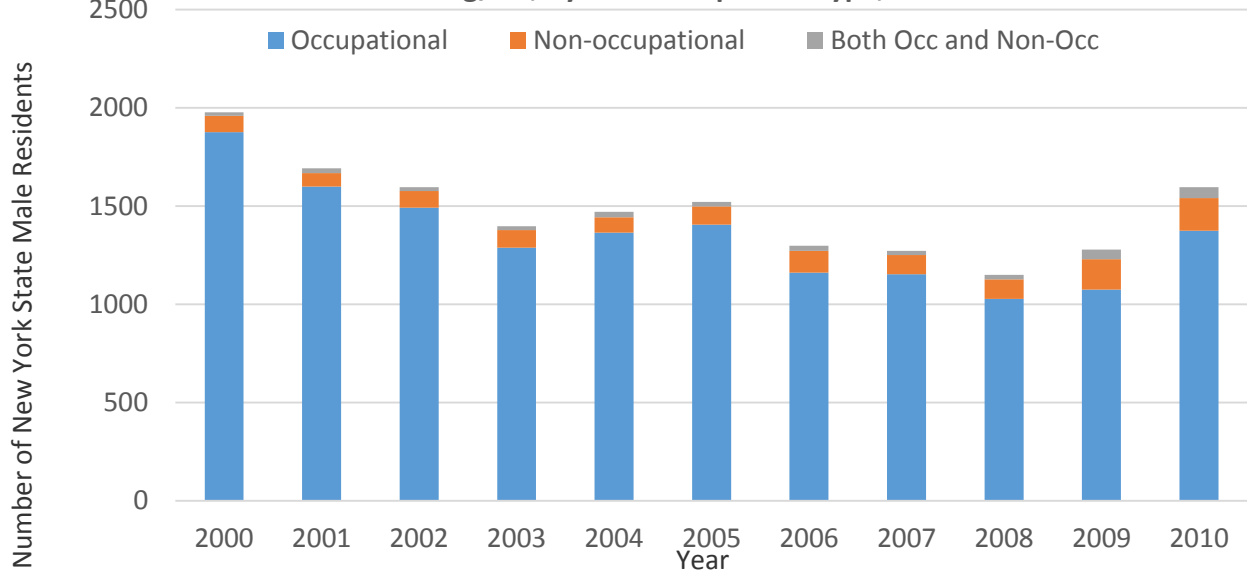
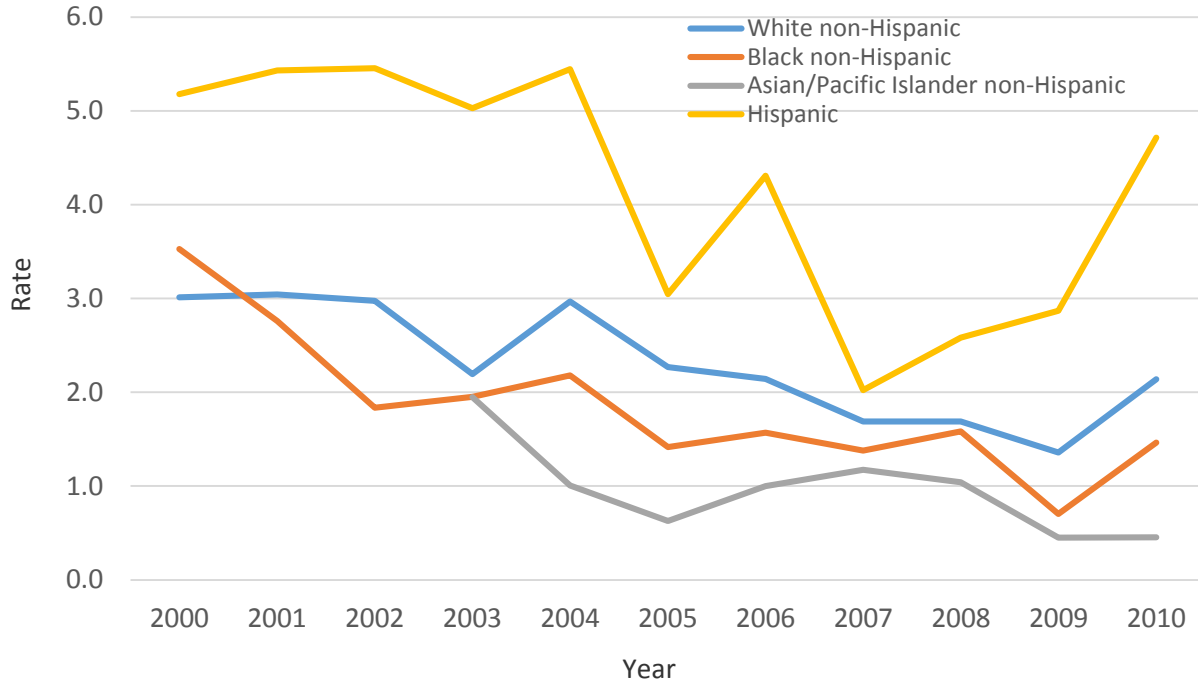


Figure 2.6. Number of New York State Male Residents with a Blood Lead Level ≥ 10 mcg/dL , by Known Exposure Type, 2000-2010



Risk of elevated BLLs varies among ethnicities in NYS also. The overall trend from 2000 to 2010 has been a decline in rates of elevated BLLs (25 mcg/dL or greater) among adults in NYS across all ethnicities during the time period, except for the increase in 2010. As indicated previously, this was most likely due to more construction jobs funded by the Recovery Act of 2009.^v It is important to note that Hispanics have almost double the rate of elevated BLLs. (Figure 2.7) This trend in decreasing rates is the same for those with BLLs less than 25 mcg/dL (data not shown).

Figure 2.7. Rate of New York State Residents with a Blood Lead Level of ≥ 25 mcg/dL, per 100,000 Employed Persons, by Ethnicity



Although the number and rate of NYS residents with elevated BLLs has decreased since 2000, many residents continue to be exposed to lead. Ongoing surveillance and examination of the data in the NYS HMR are important and can support early intervention to help prevent and reduce exposures and potential illness.

¹ Council of State and Territorial Epidemiologists. Putting Data to Work: Occupational Health Indicators from Thirteen Pilot States for 2000. September 2005.

<http://c.ymcdn.com/sites/www.cste.org/resource/resmgr/OccupationalHealth/CSTEOHIndicators.pdf>. Updated October 2012. Accessed November 2013.

² Geographic Profile of Employment and Unemployment. U.S. Department of Labor Statistics. Bureau of Labor Statistics. <http://www.bls.gov/opub/gp/laugp.htm>. Updated August 2013. Accessed March 2014.

³ U.S. Department of Labor Statistics. Bureau of Labor Statistics. *Frequently Asked Questions (FAQs)*. http://www.bls.gov/dolfaq/bls_ques23.htm. Updated May 2003. Accessed March 2014.

⁴ Involuntary part-time work on the rise. Issues in Labor Statistics. U.S. Department of Labor. Bureau of Labor Statistics. Summary 08-08. <http://www.bls.gov/opub/ils/pdf/opbils71.pdf>. December 2008. Accessed November 2013.

⁵ Steege, A. L., Baron, S. L., Marsh, S. M., Menéndez, C. C. and Myers, J. R. (2014), Examining occupational health and safety disparities using national data: A cause for continuing concern. *Am. J. Ind. Med.*, 57: 527–538. doi: 10.1002/ajim.22297.

⁶ Labor Force Participation and Work Status of People 65 Years and Older. American Community Survey Briefs. January 2013. U.S. Department of Commerce. Economics and Statistics Administration. U.S. Census Bureau. <http://www.census.gov/prod/2013pubs/acsbr11-09.pdf>. Updated January 2013. Accessed March 2014.

⁷ Murray LR. Sick and tired of being sick and tired: scientific evidence, methods, and research implications for racial and ethnic disparities in occupational health. *Am J Public Health*. 2003;93:221–226.

⁸ Prevention Agenda 2013-2017: New York State's Health Improvement Plan. Description of Population Demographics and General Health Status, New York State, 2012.

http://www.health.ny.gov/prevention/prevention_agenda/2013-2017/docs/general_description.pdf. Updated September 2013. Accessed November 2013.

⁹ Agriculture-Based Economic Development in NYS: Trends and Prospects. Charles H. Dyson School of Applied Economics and Management. College of Agriculture and Life Sciences. Cornell University. <http://dyson.cornell.edu/outreach/extensionpdf/2012/Cornell-Dyson-eb1211.pdf>. September 2012. Accessed November 2013.

¹⁰ Agency for Toxic Substances and Disease Registry. Toxicological Profile for Lead. Atlanta: ATSDR; 2007. TP-92/12.

¹¹ Gelberg KH, Fletcher AM. Adult Blood Lead Reporting in New York State, 1994-2006. *Public Health Reports*, 2010; 125:103-110.

¹² Centers for Disease Control and Prevention (CDC). *Fourth National Report on Human Exposure to Environmental Chemicals, 2009*. Available at: <http://www.cdc.gov/exposurereport/>. Updated July 2014. Accessed July 2014.

¹³ Centers for Disease Control and Prevention. National Institute for Occupational Safety and Health. Adult Blood Lead Epidemiology and Surveillance (ABLES). Available at: <http://www.cdc.gov/niosh/topics/ABLES/ables.html>. Updated May 2013. Accessed April 2014.

¹⁴ The American Recovery and Reinvestment Act; State/Territory Summary – New York. Available at: <http://www.recovery.gov/arra/Transparency/RecoveryData/Pages/statesummary.aspx?StateCode=NY>. Updated May 2014. Accessed August 2014.

¹⁵ Okun A, Cooper G, Bailer AJ, Bean J, Stayner L. Trends in Occupational lead exposure since the 1978 OSHA lead standard. *AM J Ind Med*, 2004 Jun;45(6):558-72.

¹⁶ New York State Regulations for Lead Poisoning Prevention and Control- NYCRR Title 10, Part 67-1.5. Available at: http://www.health.ny.gov/regulations/nycrr/title_10/part_67/#sec67-1-5. Accessed July 2014.

¹⁷ New York State Department of Health, American College of Obstetricians and Gynecologists, District II. Lead Poisoning Prevention Guidelines for Prenatal Care Providers. Albany (NY): New York State Department of Health; June 2009. Available at: <http://www.health.ny.gov/publications/2535.pdf>. Accessed July 2014.

¹⁸ New York State Department of Health, Center for Environmental Health, Bureau of Occupational Health and Injury Prevention, Heavy Metals Registry Report, 2006 through 2010. Available at: https://www.health.ny.gov/environmental/workplace/heavy_metals_registry/report_2010.htm. Updated November 2013. Accessed July 2014.