

# Georgia Occupational Health Surveillance Report 2006-2009





# Acknowledgements

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# Executive Summary

Over four million people aged 16 years and older make up Georgia's workforce. Almost half of a worker's lifetime is spent at work or commuting, which makes the workplace an important determinant of a person's health.<sup>1</sup> Social factors, workplace procedures and design, chemical exposures, and chronic wear and tear are all facets of the workplace that may negatively impact workers' health.<sup>1,2,3</sup> Some workers are employed in occupations or industries that may put them at higher risk of work related injuries or illnesses or being exposed to harmful substances. These injuries, illnesses, and exposures on the job can affect workers' health for the rest of their lives. Thus, the workplace provides unique opportunities for public health interventions.<sup>1</sup>

Work-related injuries and illnesses can be prevented, especially by controlling of occupational hazards and exposures. Resource allocation for prevention can be prioritized by focusing on industries and occupations that are at high risk for injury and illness.<sup>4</sup> The Council of State and Territorial Epidemiologists (CSTE), in association with the National Institute of Occupational Safety and Health (NIOSH), has recommended that states conduct surveillance for a set of 20 occupational health indicators. These indicators serve as baseline measures of the occupational health status of a state's workforce and will allow states to track trends and guide prevention and intervention efforts.<sup>4</sup> Each indicator falls under one of the five categories below:

- Health Effect Indicators (13)--measures of injury or illness that indicate adverse effects from exposure to known or suspected occupational hazards
- Exposure Indicator (1)--measures of markers in human tissue or fluid that identify the presence of a potentially harmful substance resulting from exposure in the workplace
- Hazard Indicators (3)--measures of potential for worker exposure to health and safety hazards in the workplace
- Intervention Indicators (2)--measures of intervention activities or intervention capacity to reduce workplace health and safety hazards
- Socioeconomic Impact Indicator (1)--measure of the economic impact of work-related injuries and illnesses<sup>4</sup>

Georgia has also elected to conduct surveillance for three state-specific occupational health indicators. These include work-related asthma, arthritis among workers, and workplace secondhand smoke exposure. A variety of sources were used to collect data for the 2006-2009 occupational health indicators. Due to limitations of the sources, most of the data provided are believed to be underestimates. The exact methods by which the indicators were calculated can be found in CSTE's guidance document entitled, *Occupational Health Indicators: A Guide for Tracking Occupational Health Conditions and Their Determinants* (at [www.cste.org](http://www.cste.org)).

While decreases were noted for most of the injuries and illnesses reported during 2006-2009, it is uncertain whether these decreases are due to the declines in employment observed in the state. The percent of unemployment increased from 4.6% in 2006 to 10.7% in 2010.<sup>5,6</sup> Nevertheless, the data provided in this report estimates the burden of work-related injuries and illnesses and gives baseline measures of occupational health in Georgia during 2006-2009. At the time of this report, 2009 was the most current year of data available for many of the data sources used. The information in this report can be used to identify contributory factors and develop improved or new prevention strategies and regulations to protect the health of Georgia's workers.

Below are highlights of the findings in this report:

- In 2009, private sector employers reported that an estimated 87,400 work-related injuries and illnesses occurred among workers in Georgia.
- The 2009 incidence rate of total work-related injuries and illnesses involving days away from work was 800 per 100,000 full-time workers.
- A total of 110 fatal work-related injuries were reported in Georgia during 2009.
- The five most frequent causes of fatal work-related injuries in Georgia were highway accidents, homicides, falls, being struck by an object, and having contact with electric current.
- In 2009, there were 149 hospitalizations for burns reported in Georgia among workers aged 16 years and older in which workers' compensation was the primary payer.
- The most frequent work-related musculoskeletal disorder in Georgia involves disorders of the back.
- The rate of work-related pesticide poisonings in Georgia during 2009 was 2.2 per 100,000 employed persons, slightly higher than the national rate.
- About 72% of pneumoconiosis hospitalizations in Georgia were from asbestosis.
- In Georgia, the number of new cases of mesothelioma increased from 46 in 2006 to 61 in 2009.
- In 2009, Georgia had 147 prevalent cases of elevated blood lead levels of 25 µg/dL or greater among those aged 16 years and older.
- Over 500,000 Georgia workers were employed in occupations at high risk for occupational morbidities in 2009.
- Workers' compensation benefits paid to Georgia workers with occupational injuries or illnesses increased from approximately \$1.2 billion in 2006 to \$1.5 billion in 2009.
- The rate of occupational medicine physicians in Georgia is 0.02 per 1,000 employees, much lower than the recommended rate of 1 per 1,000 employees.
- Among currently employed adults with work-related asthma, 36.4% say that their asthma is made worse by their current job, and 18.4% say that their asthma is caused by their current job.

# Profile of Georgia Workforce, Aged 16 Years and Older, 2006-2010

An average of 4.5 million civilians were employed in Georgia during 2006-2010 (Table 1). Over this five-year period, unemployment increased from 4.6% in 2006 to 10.7% in 2010. Males made up over half of Georgia's workers. In 2010, 52.8% of the workforce was males and 96.2% of workers were between the ages of 18-64 years. About 68.5% of workers were white, 27.3% were black, and 4.2% were of other races. Additionally, 8.7% of the civilian workforce was of Hispanic origin. Georgia civilian employment demographics are compared to Georgia population demographics in Appendix 1.

About 68.7% of Georgia's workers spent 40 or more hours per week on the job and about 5.9% of workers were self-employed. Educational and health services (20.8%), wholesale and retail trade (15.1%), professional and business services (12.6%), manufacturing (9.3%), and leisure and hospitality (8.8%) were the top five employment industries in the state. The five most common occupations were professional and related occupations (20.3%), management, business, and financial operations (16.4%), service (16.4%), sales and related occupations (12.5%), and office and administrative support (12.5%). Table 2 shows the leading industries and occupations by sex and by race/ethnicity in Georgia during 2010.

**Table 1. Demographic and employment characteristics, aged 16 years and older, Georgia, 2006-2010**

	2006	2007	2008	2009	2010
Total number employed	4,519,000	4,629,000	4,569,000	4,329,000	4,238,000
Civilian workforce unemployed	4.6%	4.3%	6.4%	9.8%	10.7%
Civilian self-employed	5.8%	6.1%	6.2%	6.4%	5.9%
Civilian employed part-time	12.7%	14.1%	14.7%	15.9%	16.4%
Civilian hours worked per week					
<40 hours	26.2%	26.4%	28.7%	32.6%	31.3%
40 hours	48.4%	48.0%	45.0%	43.4%	44.0%
41+ hours	25.5%	25.5%	25.5%	24.1%	23.8%
Civilian employment by sex					
Male	53.1%	53.3%	53.7%	53.4%	52.8%
Female	46.0%	46.7%	46.3%	46.6%	47.2%
Civilian employment by age group					
16-17 years	1.1%	1.0%	0.9%	0.7%	0.5%
18-64 years	96.1%	96.2%	96.0%	95.9%	96.2%
65+ years	2.7%	2.9%	3.2%	3.3%	3.3%
Civilian employment by race					
White	68.0%	67.7%	68.2%	67.8%	68.5%
Black	27.4%	27.9%	27.3%	27.7%	27.3%
Other*	3.7%	4.4%	4.6%	4.6%	4.2%
Hispanic origin*	8.0%	7.2%	7.4%	8.2%	8.7%

**Table 1. Demographic and employment characteristics, aged 16 years and older, Georgia, 2006-2010**

	2006	2007	2008	2009	2010
<b>Civilian employment by industry</b>					
Education and health services	18.7%	19.3%	20.0%	20.7%	20.8%
Wholesale and retail trade	14.8%	14.6%	14.1%	14.7%	15.1%
Professional and business services	10.6%	10.7%	11.4%	11.9%	12.6%
Manufacturing	11.3%	11.0%	10.8%	9.1%	9.3%
Leisure and hospitality	8.4%	8.1%	7.7%	8.2%	8.8%
Construction	8.9%	8.6%	8.7%	8.1%	7.4%
Transportation and utilities	6.3%	6.6%	6.5%	7.1%	6.6%
Financial services	6.5%	7.3%	7.2%	6.7%	6.2%
Mining	0.2%	0.2%	0.1%	0.1%	0.1%
Public administration	5.1%	4.8%	5.2%	4.9%	5.3%
Other services	4.9%	4.7%	4.6%	4.9%	4.5%
Information	3.0%	3.2%	2.9%	2.5%	2.6%
Agriculture	1.2%	1.0%	0.9%	1.3%	0.9%
<b>Civilian employment by occupation</b>					
Professional and related occupations	18.5%	20.0%	21.1%	21.4%	20.3%
Management, business, and financial operations	14.7%	14.6%	16.3%	16.0%	16.4%
Service	16.0%	14.9%	14.6%	15.8%	16.4%
Sales and related occupations	11.3%	12.3%	11.9%	12.5%	12.5%
Office and administrative support	13.4%	13.4%	13.3%	12.3%	12.5%
Transportation and material moving	6.8%	6.8%	6.4%	6.9%	7.0%
Construction and extraction	7.5%	6.6%	6.2%	5.6%	5.6%
Production	6.7%	6.7%	6.0%	4.8%	5.1%
Installation, maintenance, and repair	4.4%	4.3%	3.8%	3.9%	3.8%
Farming, fishing, and forestry	0.6%	0.3%	0.4%	0.6%	0.4%

Source: U.S. Department of Labor, Bureau of Labor Statistics, Geographic Profile of Employment and Unemployment, 2006-2010

\* Persons of Hispanic origin may be of any race (white, black, other)

\*Other includes Asians, American Indians, Alaskan Natives/Pacific Islanders

**Table 2. Leading industry and occupation employment by sex, race, and ethnicity, Georgia, 2010**

	Industry		Occupation	
<b>Male</b>	Professional and business services	14.4%	Management, business, and financial operations	17.5%
	Manufacturing	12.9%	Professional and related occupations	15.8%
	Construction	12.4%	Service occupations	14.1%
<b>Female</b>	Education and health services	33.9%	Professional and related occupations	25.3%
	Wholesale and retail trade	15.4%	Office and administrative support occupations	19.6%
	Professional and business services	10.6%	Service occupations	19.0%
<b>White</b>	Education and health services	19.1%	Professional and related occupations	21.0%
	Wholesale and retail trade	14.6%	Management, business, and financial operations	18.5%
	Professional and business services	12.9%	Service occupations	14.6%
<b>Black</b>	Education and health services	25.6%	Service occupations	21.8%
	Wholesale and retail trade	16.1%	Professional and related occupations	16.6%
	Professional and business services	10.8%	Office and administrative support	14.9%
<b>Asian</b>	Professional and business services	20.8%	Professional and related occupations	34.6%
	Wholesale and retail trade	18.7%	Management, business, and financial operations	14.6%
	Education and health services	18.1%	Sales and related occupations	11.9%
<b>Hispanic</b>	Construction	23.5%	Service Occupations	26.7%
	Leisure and Hospitality	14.7%	Construction and extraction	22.4%
	Manufacturing	13.9%	Production occupations	11.0%

Source: U.S. Department of Labor, Bureau of Labor Statistics, Geographic Profile of Employment and Unemployment, 2010

## Indicator 1: Nonfatal Injuries and Illnesses Reported by Employers, Georgia, 2006-2009

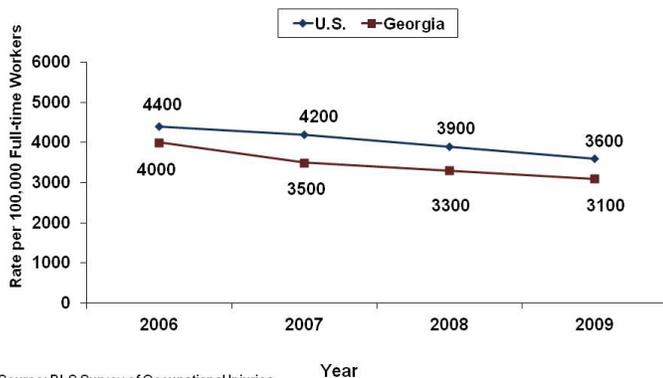
Data from the Bureau of Labor Statistics (BLS) Annual Survey of Occupational Injuries and Illnesses (SOII) were used to estimate the incidence of non-fatal work-related injuries and illnesses in Georgia during 2006-2009. The SOII is an annual sample survey of employers conducted by the BLS. Employers are surveyed on all work-related injuries and illnesses that resulted in one or more days away from work, death, loss of consciousness, restricted work, or medical treatment beyond first aid. Work-related injuries and illnesses include any injury or illness experienced by an employee while performing work-related activities on or off the worksite.<sup>1</sup> Most injuries and illnesses that occur in the workplace are preventable. Monitoring and tracking of workplace injuries and illnesses can help guide priorities for prevention and intervention efforts.<sup>4</sup>

The employer-reported incidence of work-related injuries and illnesses in Georgia declined each year since 2006. In 2009, private sector employers reported an estimated 87,400 work-related injuries and illnesses occurring among workers in Georgia (Table 3). This corresponds to a rate of about 3,100 per 100,000 full-time workers who had a work-related injury or illness (Figure 1). About 26% (22,300) of these cases involved one or more days away from work, while about 11% (9,740) of these cases involved more than 10 days away from work. The 2009 incidence rate of total work-related injuries and illnesses involving days away from work was 800 per 100,000 full-time workers (Figure 2). The industries in Georgia with the highest number of non-fatal work-related injuries are listed in Table 4. There were 27,600 non-fatal injuries in the trade, transportation, and utilities industry, the highest number among all the industries. Public administration, education and health services (i.e. hospital, nursing and residential care, ambulatory care), and construction were the top three industries with the highest incidence rates of non-fatal injuries in Georgia during 2006-2009.

**Table 3. Total number of work-related injuries and illnesses, Georgia, 2006-2009**

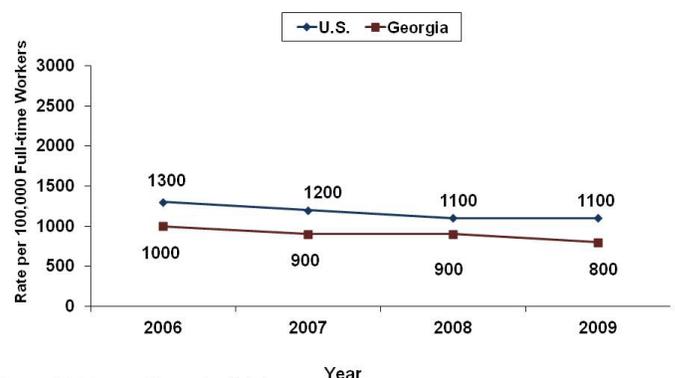
	2006	2007	2008	2009
Estimated total number of work-related injuries and illnesses	114,400	101,800	98,300	87,400
Estimated total number of cases involving days away from work	28,100	26,200	26,800	22,300
Estimated total number of cases involving more than 10 days away from work	11,200	10,470	11,260	9,740

Figure 1. Annual incidence rate of total non-fatal work-related injuries and illnesses, Georgia and U.S., 2006-2009



Source: BLS Survey of Occupational Injuries and Illnesses (SOII)

Figure 2. Annual incidence rate of total non-fatal work-related injuries and illnesses involving days away from work, Georgia and U.S., 2006-2009



Source: BLS Survey of Occupational Injuries and Illnesses (SOII)

**Table 4. Leading industries with non-fatal work-related injuries, Georgia, 2009**

	Number Non-Fatal Injuries	Incidence Rate per 100,000
Public administration	12,400	9,900
Education & health services	16,500	4,500
Construction	6,800	3,900
Trade, transportation, & utilities	27,600	3,700
Manufacturing	13,500	3,600
Leisure & hospitality	900	3,500
Natural resources and mining	600	2,400

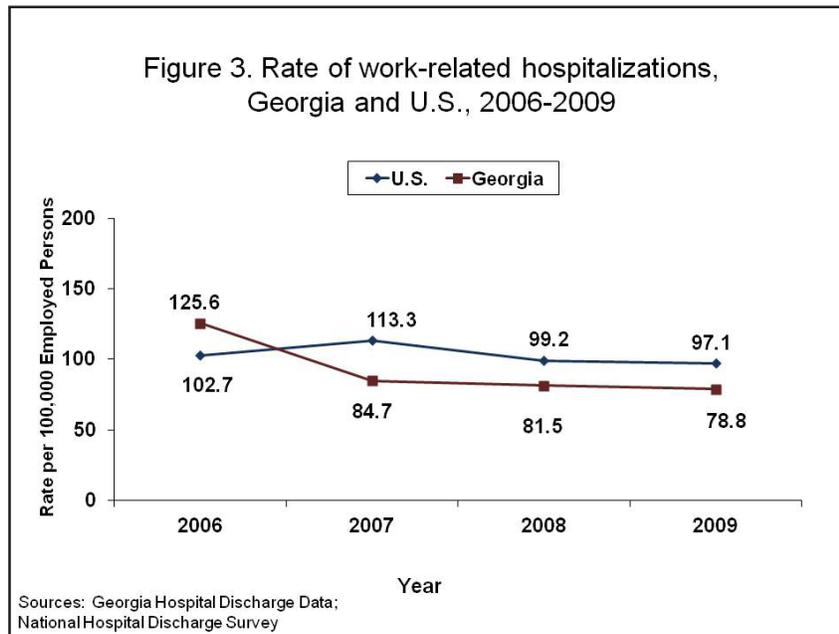
\*Rates are the number of workers per 100,000 employed in the specific industry

\*Public administration industry includes justice, public order, and safety activities, police protection, correctional institutions, and security and international affairs

## Indicator 2: Work-Related Hospitalizations, Georgia, 2006-2009

Work-related hospitalizations represent some of the most severe and costly work-related injuries and illnesses. Work-related hospitalizations have the primary payer coded as workers' compensation. Since less than 10 percent of workers who receive workers' compensation are hospitalized, work-related hospitalizations underestimates the actual burden of injuries and illnesses. In addition, most individuals who are injured on the job do not file for workers' compensation.<sup>4</sup> In 2008, Georgia had 3,726 work-related hospitalizations among workers age 16 years and older in which worker's compensation was the primary payer. Also, some workers may not be covered by workers' compensation, such as self-employed workers.

Hospital discharge data, collected by the Georgia Hospital Association, were used to estimate work-related hospitalizations during 2006-2009. The number of work-related hospitalizations in Georgia declined during 2006-2009. There was a large number of work-related hospitalizations in 2006 (5,675 hospitalizations) compared to 2007 (3,923 hospitalizations), 2008 (3,726 hospitalizations), and 2009 (3,410 hospitalizations). The rate of work-related hospitalizations per 100,000 employed persons in Georgia was higher than the national rate in 2006. The rate decreased from 125.6 per 100,000 employed persons in 2006 to 78.8 per 100,000 in 2009 (Figure 3).



### Indicator 3: Fatal Work-Related Injuries, Georgia, 2006-2009

Fatal work-related injuries were determined using data from the Bureau of Labor Statistics (BLS) Census of Fatal Occupational Injuries (CFOI). The CFOI collects data from a variety of sources such as death certificates, Workers' Compensation records, police and medical examiner reports, news media, and Occupational Safety and Health Administration (OSHA) reports. Data for both intentional (i.e. homicides, suicides) and unintentional (i.e. falls, highway accidents, electrocutions) work-related deaths are collected.<sup>4</sup> A total of 110 fatal work-related injuries in Georgia were reported to CFOI in 2009. This was a decrease from the number of fatal injuries that occurred in previous years (Table 5). Among these deaths, 103 (93.6%) were among men and 7 (6.4%) were among women. In 2009, workers aged 45-54 years had the highest number of fatal work-related deaths with 36 deaths. The rate of fatal work-related injuries for Georgia workers was 2.6 per 100,000 in 2009 and decreased annually since 2006. The work-related fatality rate in Georgia was lower than the U.S. rate in 2009 (Figure 4).

Five of the most frequent causes of fatal work-related injuries were highway accidents, homicides, falls, being struck by an object, and having contact with electric current. There were declines for each of these incidents in Georgia during 2009 compared to 2008. The number of fatal injuries in Georgia due to having contact with electric current remained the same from 2007 through 2009. Highway incidents were the primary cause of fatal work injuries (Figure 5).

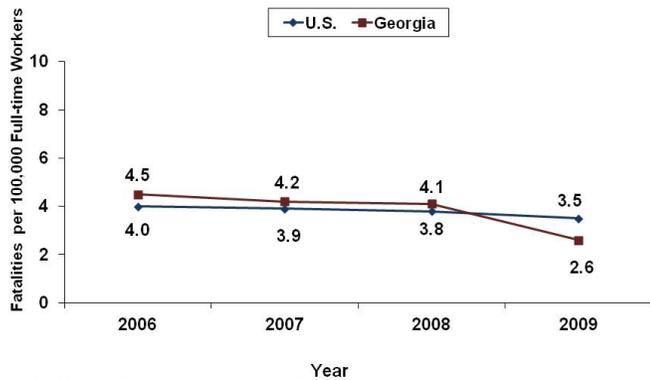
In 2009, the majority of fatal work-related injuries among Georgia workers occurred in the transportation and utilities and construction industries (Table 6). The highest rate of fatal injuries occurred among workers in the agriculture, forestry, fishing, and hunting industry.

**Table 5. Total number of fatal work-related injuries, Georgia, 2006-2009**

	2006	2007	2008	2009*
Total	201	193	182	110
Sex				
Male	174	177	170	103
Female	27	16	12	7
Age Group (years)				
16-17	0	3	0	0
18-19	3	5	5	0
20-24	15	16	11	8
25-34	37	45	32	20
35-44	46	36	38	19
45-54	51	47	53	36
55-64	28	32	24	13
65+	20	9	15	12
Race/Ethnicity				
White, non-Hispanic	119	118	100	79
Black, non-Hispanic	41	42	48	17
Hispanic	35	28	26	10
Other	6	3	6	3

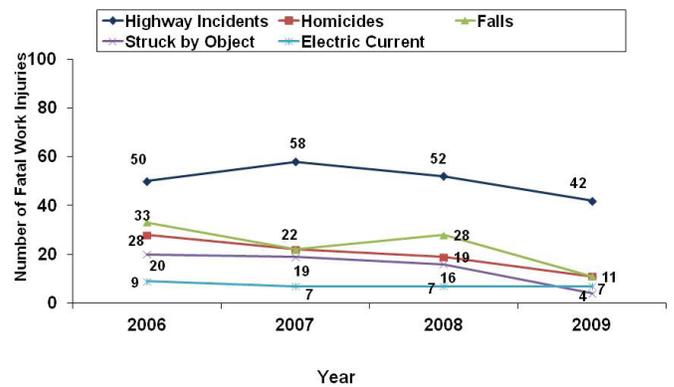
\*Georgia mortality data for 2009 may be unreliable

Figure 4. Rate of fatal work-related injuries, Georgia and U.S., 2006-2009



\*Georgia mortality data for 2009 may be unreliable  
Source: Census of Fatal Occupational Injuries (CFOI)

Figure 5. Five most frequent work-related fatal injury events, Georgia, 2006-2009



Source: Census of Fatal Occupational Injuries (CFOI)

Table 6. Leading industries with fatal work-related injuries, Georgia, 2009

	Number of Fatal Injuries	Fatality Rate per 100,000
Agriculture, forestry, fishing, and hunting	10	18.0
Transportation and utilities	25	8.7
Construction	26	8.6
Professional and businesses services	13	2.9
Public administration	6	2.4
Wholesale and retail trade	11	1.9
Leisure and hospitality	5	1.7

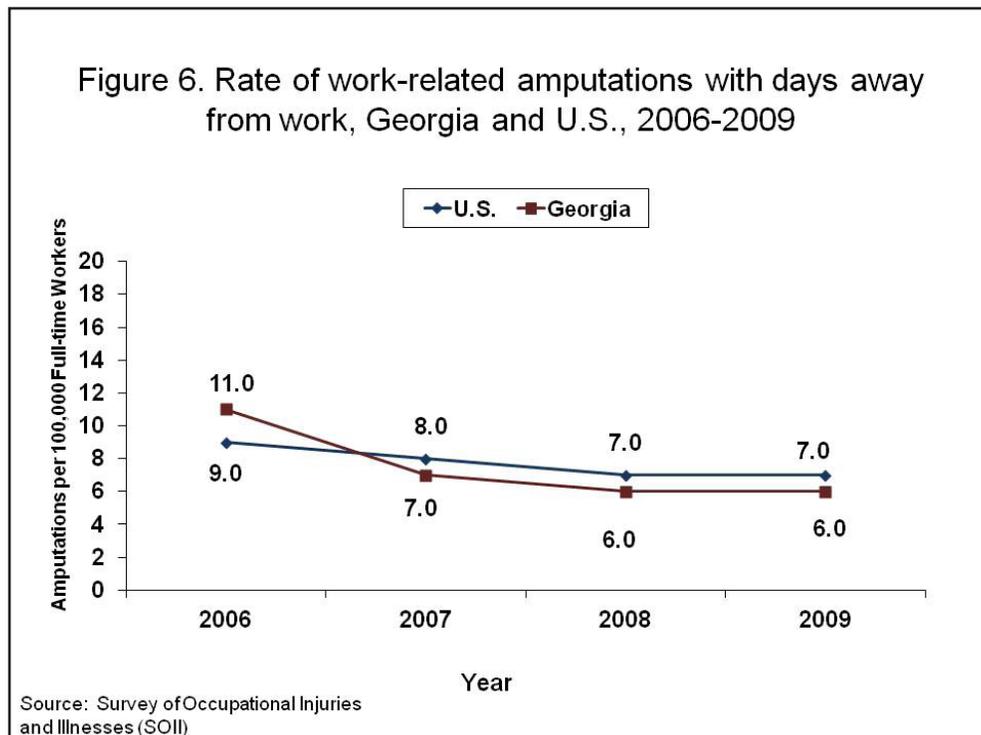
\*Rates are the number of workers per 100,000 employed in the specific industry

## Indicator 4: Work-related Amputations with Days Away from Work Reported by Employers, Georgia, 2006-2009

Work-related amputations are serious and preventable injuries usually resulting from occupational hazards or improper use of equipment. Besides the economic burden, amputations also affect workers' productivity and ability to perform job functions.<sup>4</sup> Data from the BLS Survey of Occupational Injury and Illness (SOII) was used to estimate the number of work-related amputations with days away from work in Georgia during 2006-2009. There were 180 work-related amputations in Georgia that involved days away from work in 2009. This was a decrease from the number of amputations observed in previous years (Table 7). All of the 180 amputations in 2009 were finger amputations, the majority of which resulted from use of machinery. Production and installation, maintenance, and repair occupations were the occupations reporting employers with work-related amputations in 2009. The annual incidence rate of work-related amputations in Georgia declined from 11.0 per 100,000 in 2006 to 6.0 per 100,000 in 2009 (Figure 6).

**Table 7. Total number of work-related amputations with days away from work reported by employers, Georgia, 2006-2009**

	2006	2007	2008	2009
Estimated number of amputations	320	210	190	180



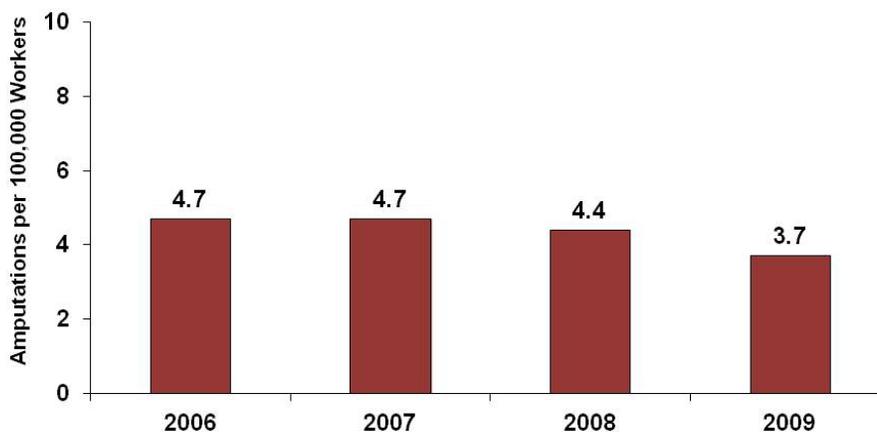
## Indicator 5: Workers' Compensation Claims for Amputations with Lost Work Time, Georgia, 2006-2009

State workers' compensation claims for amputations based on the National Council on Compensation Insurance (NCCI) codes were obtained from the Georgia State Board of Workers' Compensation, regardless of age, state of residence, or open or closed claim status. Cases were based on the date of injury. In Georgia, a lost work time claim is defined as an injury that results in seven or more days lost from work. In 2009, there were 134 amputation cases in Georgia resulting in seven or more lost workdays that were filed with workers' compensation. This is a decline from the number of claims for amputations filed in 2006, 2007, and 2008 (Table 7). The incidence rate of amputations filed was steady at 4.7 per 100,000 workers covered by workers' compensation in 2006 and 2007, and then it declined to 4.4 per 100,000 workers in 2008. The rate declined further in 2009 to 3.7 per 100,000 workers (Figure 7).

**Table 7. Number of amputations with lost work time filed with workers' compensation, Georgia, 2006-2009**

	2006	2007	2008	2009
Annual number of amputations	182	182	167	134

**Figure 7. Incidence rate of amputation cases with lost work-time filed with state workers' compensation, Georgia, 2006-2009**



Source: Georgia Board of Workers' Compensation

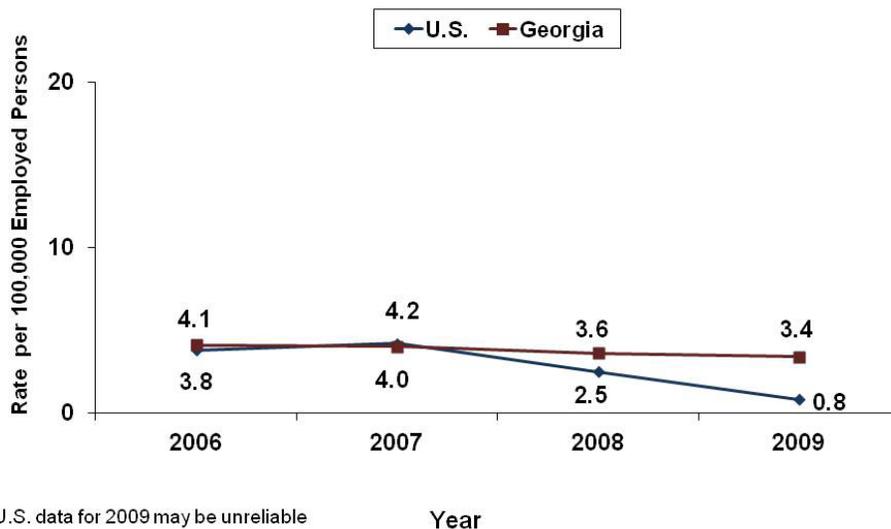
## Indicator 6: Hospitalizations for Work-related Burns, Georgia, 2006-2009

It's estimated that about 30%-40% of burns are work-related, with the majority of cases occurring among males and younger workers.<sup>4</sup> Burn hospitalizations can be devastating, painful, and costly to treat. Hospitalizations for work-related burns were estimated using data from the Georgia Hospital Association's Hospital Discharge Data. Hospitalizations for burns with workers' compensation coded as the primary payer were considered to be work-related. In 2009, Georgia had 149 hospitalizations for burns, among workers aged 16 years and older in which workers' compensation was the primary payer. This was a decline from the annual number of burns observed in previous years (Table 8). About 3.4 per 100,000 workers aged 16 years and older in Georgia were hospitalized due to work-related burns in 2009. As observed in Figure 8, the rate of work-related burn hospitalizations in Georgia is slightly higher than the national rate.

**Table 8. Number of hospitalizations for work-related burns, Georgia, 2006-2009**

	2006	2007	2008	2009
Annual number of work-related burns	184	186	165	149

**Figure 8. Rate of work-related burn hospitalizations, Georgia and U.S., 2006-2009**



\*U.S. data for 2009 may be unreliable  
Sources: Georgia Hospital Discharge Data;  
National Hospital Discharge Survey

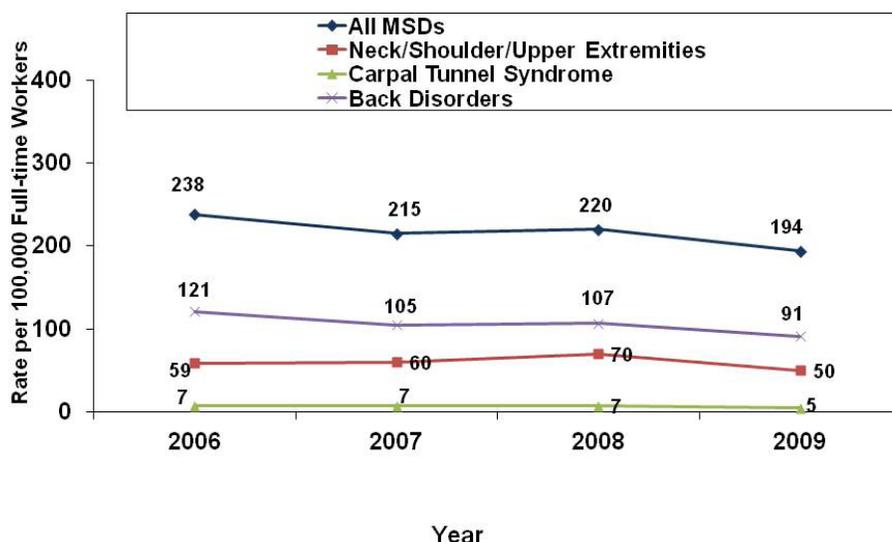
## Indicator 7: Work-related Musculoskeletal Disorders with Days Away from Work Reported by Employers, Georgia, 2006-2009

The U.S. Department of Labor defines musculoskeletal disorders as injuries or disorders of the muscles, nerves, tendons, joints, cartilage, and spinal discs that are not caused by slips, trips, falls, motor vehicle crashes or similar events. Work-related musculoskeletal disorders are caused or aggravated by work activities.<sup>4</sup> The BLS Survey of Occupational Injuries and Illnesses (SOII) was used to estimate the number and rate of work-related musculoskeletal disorders. In 2009, Georgia had 5,380 total musculoskeletal disorder cases reported by employers that involved days away from work. The total number of work-related musculoskeletal disorder cases in Georgia has been declining since 2006 (Table 9). Three categories of musculoskeletal disorders (MSDs) include neck/shoulder/upper extremities, carpal tunnel syndrome, and disorders of the back. The numbers of MSDs within each of these three categories occurring during 2006-2009 in Georgia are also shown in Table 9. The most frequent work-related MSD in Georgia involves disorders of the back. In 2009, there were 2,520 cases of work-related MSDs of the back reported in Georgia. In 2009, the incidence rate of all MSDs in Georgia was 194 per 100,000 full-time workers and the rate of MSDs of the back was 94 per 100,000 full-time workers (Figure 9).

**Table 9. Total number of work-related musculoskeletal disorder cases reported by employers, Georgia, 2006-2009**

	2006	2007	2008	2009
Total number of work-related MSDs	6,840	6,310	6,550	5,380
Number work-related MSDs of the back	3,470	3,100	3,200	2,520
Number work-related MSDs of the neck/shoulder/upper extremities	1,680	1,770	2,100	1,400
Number work-related MSDs of carpal tunnel syndrome	210	210	200	150

**Figure 9. Incidence rate of work-related musculoskeletal disorders, Georgia, 2006-2009**



Source: Survey of Occupational Injuries and Illnesses (SOII)

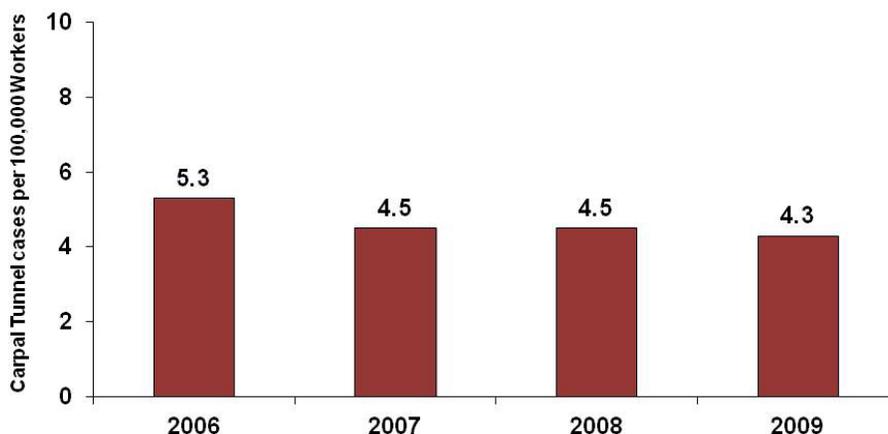
## Indicator 8: Workers' Compensation Claims for Carpal Tunnel Syndrome with Lost Work Time, Georgia, 2006-2009

Carpal tunnel syndrome results when the median nerve that runs from the forearm to the palm of the hand is pressed or squeezed at the wrist, resulting in pain, numbness, or weakness in the hand and wrist and sometimes radiating up the arm. Carpal tunnel syndrome is common among people performing assembly line work, such as manufacturing, sewing, finishing, meat, poultry, or fish packing.<sup>7</sup> Carpal tunnel syndrome ranks second behind back injuries as the leading cause of lost work-time diagnoses and claims.<sup>8</sup> Carpal tunnel syndrome cases with seven or more days lost from work (lost work-time) filed with the Georgia State Board of Workers' Compensation during 2006-2009 were used to estimate the annual number and rate. Cases included were based on the date of injury and the National Council on Compensation Insurance (NCCI) codes for carpal tunnel syndrome, regardless of age, state of residence, or open or closed claim status. In 2009, there were 156 carpal tunnel syndrome cases in Georgia resulting in seven or more lost work days with claims filed with workers' compensation. This was a decrease from the numbers observed during 2006-2008 (Table 10). The rate of carpal tunnel syndrome cases with lost work-time filed with workers' compensation in Georgia during 2009 was 4.3 per 100,000 covered workers (Figure 10). Carpal tunnel syndrome can be prevented at the workplace by having workers take frequent breaks, perform stretching exercises, rotate job tasks, use correct posture and wrist position, and/or wear splints to keep wrists straight.

**Table 10. Number of carpal tunnel syndrome cases with lost work time filed with workers' compensation, Georgia, 2006-2009**

	2006	2007	2008	2009
Annual number of carpal tunnel syndrome claims	204	175	172	156

**Figure 10. Incidence rate of carpal tunnel syndrome cases with lost work-time filed with state workers' compensation, Georgia, 2006-2009**



Source: Georgia Board of Workers' Compensation

## Indicator 9: Pneumoconiosis Hospitalizations, Georgia, 2006-2009

Pneumoconiosis is a class of non-malignant lung disease that includes asbestosis, coal workers' pneumoconiosis and silicosis. Nearly all cases of pneumoconiosis are caused by occupational exposures to mineral or metallic dust particles. Asbestosis results from inhalation of microscopic asbestos fibers. Coal workers' pneumoconiosis, also called "black lung disease," results from inhalation of coal dust. Silicosis results from inhalation of free crystalline silica. There is typically a long latency period for pneumoconiosis of about 10-15 years.<sup>4</sup> Therefore, the current incidence presented in this report result may not be representative of the current exposures. Controlling occupational exposures to dust is the single most effective means of preventing pneumoconiosis.<sup>4</sup> Data for pneumoconiosis hospitalizations were obtained from Georgia Hospital Discharge Data. In 2009, Georgia had 323 total hospitalizations for pneumoconiosis. The 2009 age-adjusted rate of total pneumoconiosis hospitalizations in Georgia was 50.1 per million residents. About 72% of the pneumoconiosis hospitalizations in 2009 were from asbestosis. There were 232 asbestosis hospitalizations, 35 coal workers' pneumoconiosis hospitalizations, 41 silicosis hospitalizations, and 15 hospitalizations for other and unspecified pneumoconiosis in Georgia during 2009. The age-standardized rates of pneumoconiosis hospitalizations per million Georgia residents for 2009 are shown in Figure 11. National rates of pneumoconiosis (all types) are generally higher than rates in Georgia. During 2006-2009, hospitalization rates for asbestosis declined from 43.7 per 100,000 residents to 36.4 per 100,000 residents. However, rates of coal workers' pneumoconiosis and silicosis in Georgia did not decrease (Figure 12).

Figure 11. Age-standardized rates of hospitalization for pneumoconiosis, Georgia and U.S., 2009

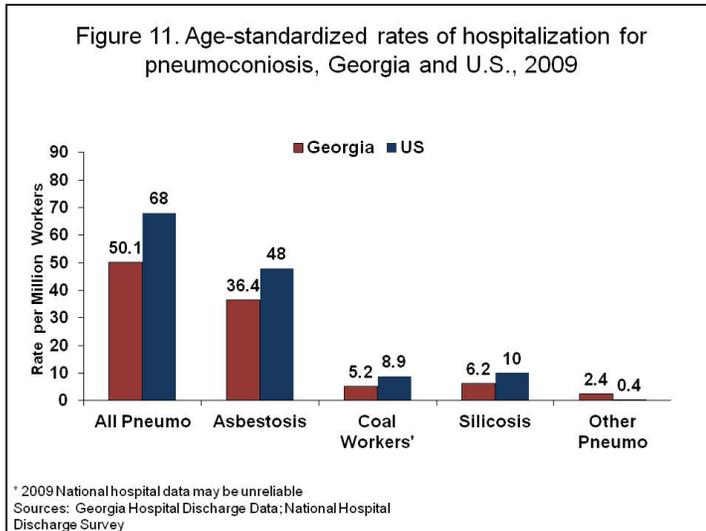
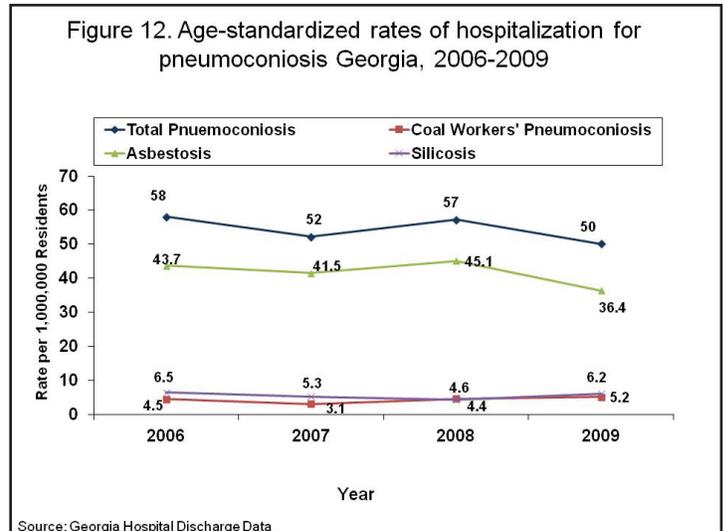


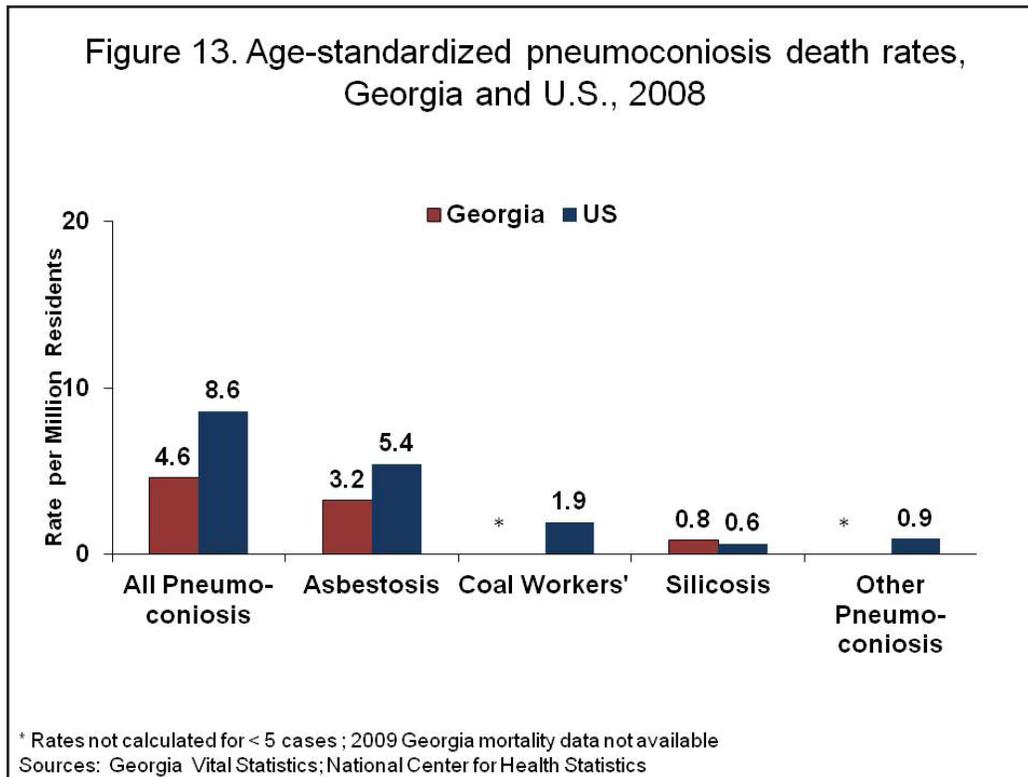
Figure 12. Age-standardized rates of hospitalization for pneumoconiosis Georgia, 2006-2009



## Indicator 10: Pneumoconiosis Mortality, 2008

Data for pneumoconiosis were obtained from the Georgia Office Vital Records. There were 28 deaths caused by pneumoconiosis among Georgia residents in 2008\*. Of these deaths, 20 were due to asbestosis, five were from silicosis, less than five deaths from coal workers' pneumoconiosis, and less than five were due to other or unspecified pneumoconiosis. The age-standardized total pneumoconiosis death rate for 2008 was 4.6 per million Georgia residents. The age-standardized rate of deaths from asbestosis was 3.2 per million Georgia residents. The mortality rate for silicosis in Georgia during 2008 was similar to the national rate (Figure 13).

\*Georgia 2009 mortality data were not available at time of this report.



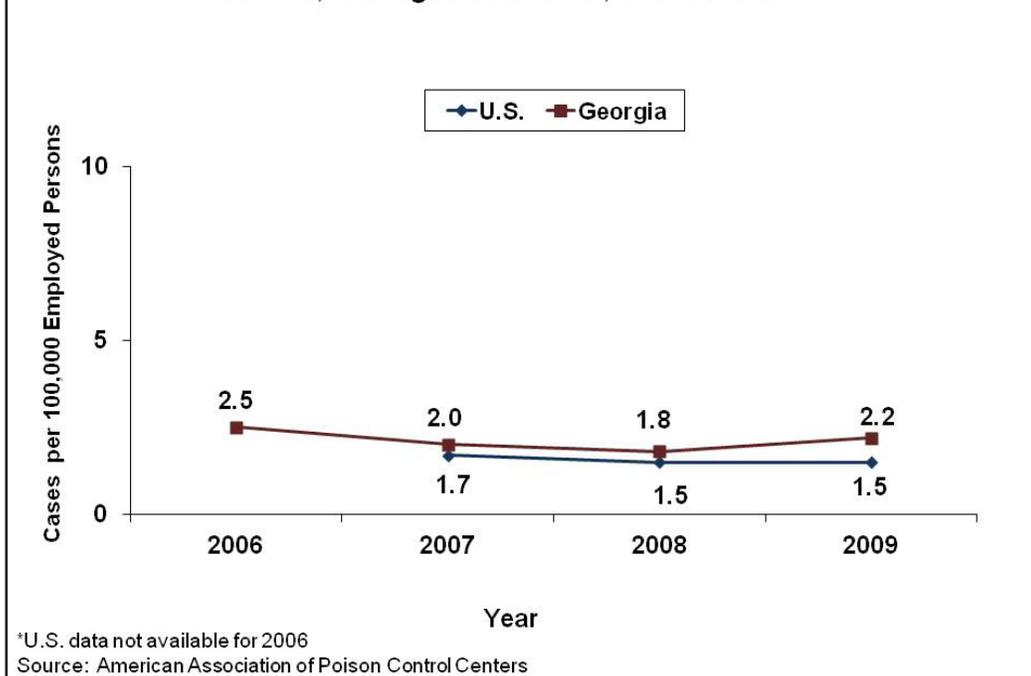
## Indicator 11: Acute Work-Related Pesticide Poisonings Reported to Poison Centers, Georgia, 2006-2009

Pesticides are designed to kill and harm living organisms, particularly insects, plants, animals, or fungi. Workers who handle pesticides are at an increased risk for exposure, resulting in adverse health effects.<sup>4</sup> The number of work-related pesticide poisonings is estimated from reported calls to Poison Centers and is obtained from the American Association of Poison Control Centers. In Georgia, 96 work-related pesticide poisonings were reported in 2009. The number of work-related pesticide poisonings has decreased in Georgia since 2006 (Table 11). The annual incidence rate of reported pesticide poisonings per 100,000 employed persons aged 16 years and older decreased in 2007 and 2008. However, the incidence rate of reported poisonings increased from 1.8 per 100,000 in 2008 to 2.2 per 100,000 in 2009. The rate of work-related pesticide poisonings in Georgia was slightly higher than the national rate during 2007-2009 (Figure 14).

**Table 11. Annual number of reported work-related pesticide poisoning cases, Georgia, 2006-2009**

	2006	2007	2008	2009
Number of reported pesticide poisonings	111	92	82	96

**Figure 14. Annual incidence rate of reported pesticide poisoning cases, Georgia and U.S., 2006-2009**

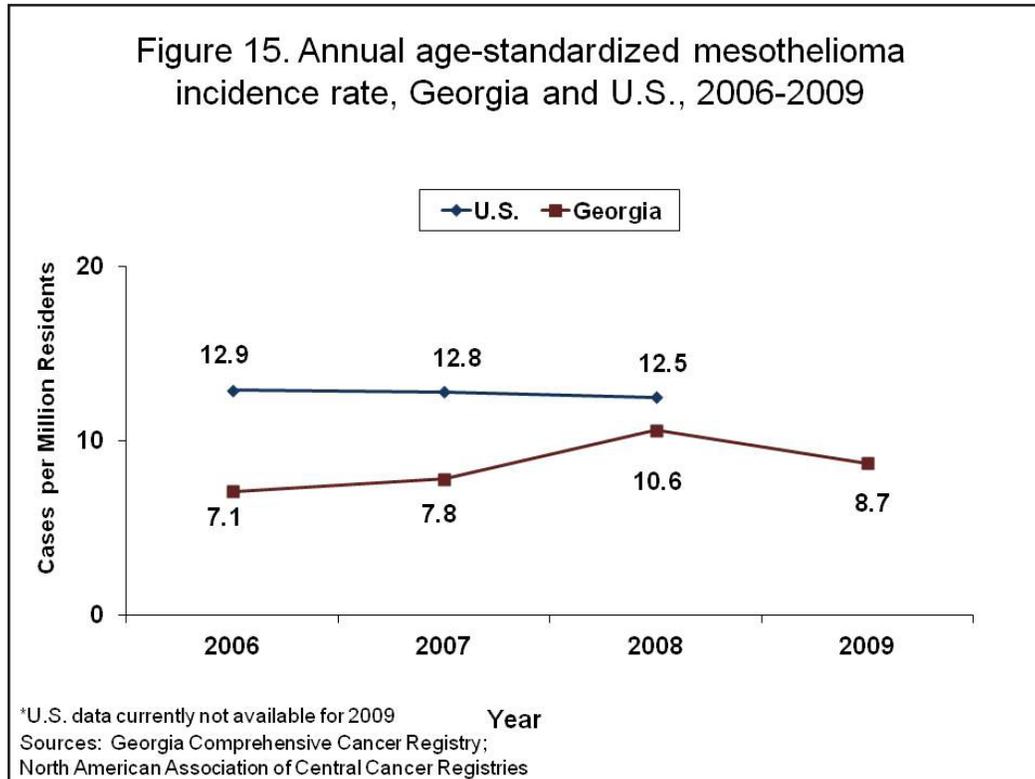


## Indicator 12: Incidence of Malignant Mesothelioma, Georgia, 2006-2009

Mesothelioma is a rare, but fatal, cancer of the mesothelial tissue lining the lung cavity, abdominal cavity, heart sac, and/or testis sac. It is estimated that 90% of mesothelioma cases are caused by exposure to asbestos and related fibers. Most cases of malignant mesothelioma are diagnosed at an already advanced stage of disease. With a latency period of 20-40 years, the incidence of malignant mesothelioma presented in this report is not indicative of current exposures. It may take many years before reductions in occupational exposure affect the incidence.<sup>4</sup> In Georgia, the number of new cases of mesothelioma increased from 46 in 2006 to 61 in 2009 (Table 12). The age-standardized mesothelioma incidence rate per million Georgia residents increased from 7.1 in 2006 to 10.6 in 2008, and then decreased to 8.7 in 2009. The incidence rate of mesothelioma in Georgia was lower than the national rate during 2006-2008 (Figure 15).

**Table 12. Number of incident mesothelioma cases, Georgia, 2006-2009**

	2006	2007	2008	2009
Number of mesothelioma cases	46	49	71	61



## Indicator 13: Elevated Blood Lead Levels (BLL) among Adults, Georgia, 2006-2009

Lead is a toxic metal found both in the environment and the workplace. Exposure to lead can have adverse effects on multiple organ systems and cause permanent damage. Even exposure to low doses of lead have been associated with hypertension, cognitive dysfunction, adverse effects on renal function, and adverse effects on female reproductive outcomes. The blood lead level is a biological indicator of recent exposure to lead. Lead poisoning is mainly an occupational health issue for adults. Parents who unintentionally bring lead home from the workplace can expose their children to lead. It is estimated that 24,000 children in the United States have elevated blood lead levels of 10 µg/dL or more from lead being brought home from work by their parents. Some of the adverse health effects from lead exposure experienced by children include neurologic damage, learning disabilities, and behavior problems.<sup>4</sup> Industries with the highest risk of exposures to lead include battery manufacturing, secondary smelting refining of nonferrous metals, and painting and paper hanging.<sup>9</sup> The federal Occupational Health and Safety Administration (OSHA) requires BLL monitoring for employees who meet certain exposure criteria. The average blood lead level for the general population is less than 2 µg/dL. Adult BLL is considered elevated at 25 µg/dL, however, toxicity may occur at levels as low as 5 µg/dL.<sup>4</sup>

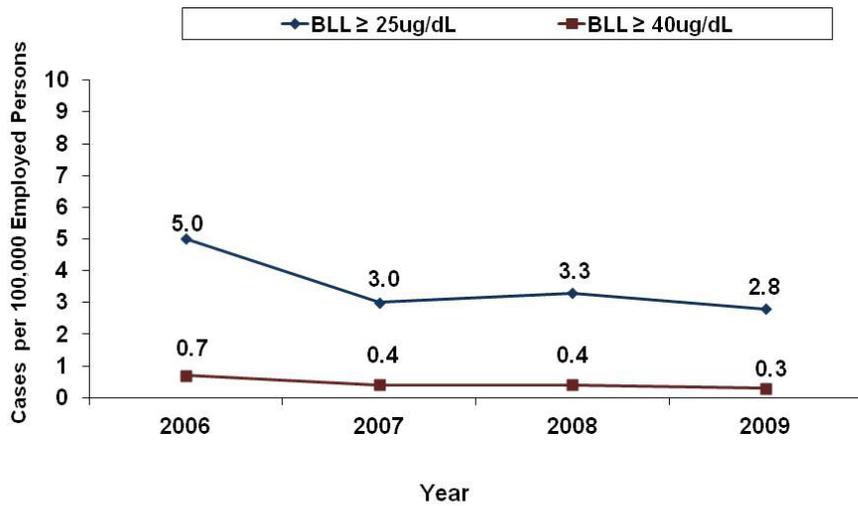
In 2009, Georgia had 147 prevalent cases age 16 years and older with elevated blood lead levels of 25 µg/dL or greater (120 of which were newly identified or incident cases) that were reported to the Georgia Adult Blood Lead Epidemiology Surveillance (ABLES) Program (Table 13). Of these cases, 16 residents had elevated blood lead levels of 40 µg/dL or greater (15 incident cases). The annual number of elevated blood lead cases in Georgia varies each year. The number of reported incident cases of elevated BLL of 25 µg/dL or greater decreased from 224 in 2006 to 120 in 2009. This resulted in an incident rate per 100,000 employed persons that decreased from 5.0 per 100,000 in 2006 to 2.8 per 100,000 in 2009 (Figure 16). Incident rates of elevated blood lead levels in Georgia were similar to the national rates in 2008 and 2009 (Figure 17).

**Table 13. Number of incident cases of elevated\* blood lead levels, Georgia, 2006-2009**

	2006	2007	2008	2009
Prevalent cases blood lead levels ( ≥25 µg/dL)	262	176	191	141
Incident cases blood lead levels ( ≥25 µg/dL)	224	140	151	120
Prevalent cases blood lead levels ( ≥40 µg/dL)	35	22	25	16
Incident cases blood lead levels ( ≥40 µg/dL)	33	18	20	15

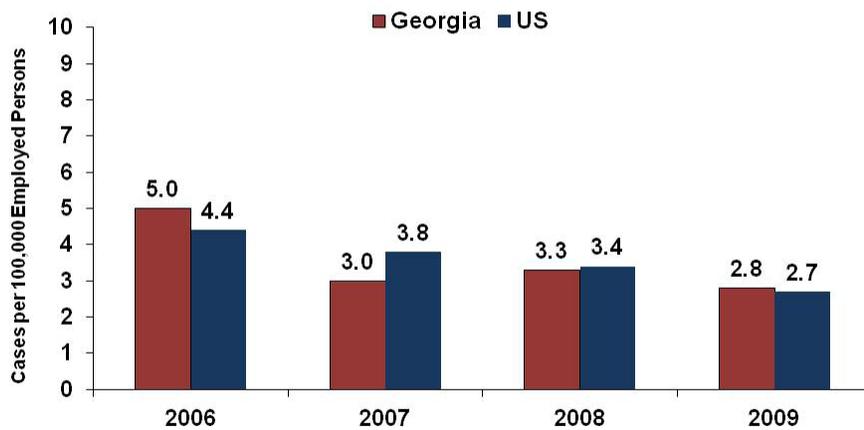
\*Note: Elevated among persons aged 16 years or older

Figure 16. Annual incidence rate of elevated blood lead levels among persons aged 16 years and older, Georgia, 2006-2009



Source: Adult Blood Lead Epidemiology Surveillance (ABLES) Program

Figure 17. Annual incidence rate of elevated blood lead levels ( $\geq 25 \mu\text{g}/\text{dL}$ ) among persons aged 16 years and older, Georgia and U.S., 2006-2009



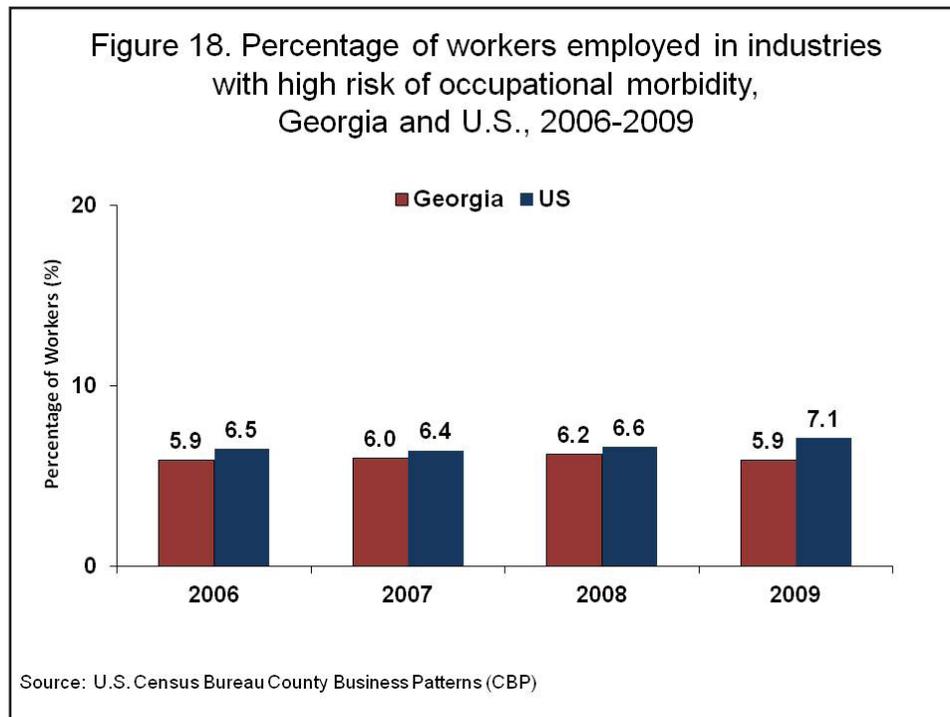
Source: Adult Blood Lead Epidemiology and Surveillance (ABLES) Program

## Indicator 14: Workers employed in industries and occupations at high risk for occupational morbidities, Georgia, 2006-2009

In 2009, the Bureau of Labor Statistics (BLS) reported an estimated injury and illness incidence rate of 3,600 cases per 100,000 full-time workers in the United States. Some industries have been identified as high risk for occupational morbidities based on having significantly higher injury and illness rates compared to the national average.<sup>4,10</sup> These high risk industries are listed in Appendix 2 and include the average number of persons who were employed in these industries in Georgia during 2009. There were more than 200,000 workers employed in high risk industries in Georgia during 2009 (Table 14). This is a decrease from the numbers observed in years 2006 through 2008. The percentage of persons employed in high risk industries was 5.9% in 2009, a slight decrease from the previous year (Figure 18).

**Table 14. Number of workers employed in industries at high risk industries for occupational injury and illness, Georgia, 2006-2009**

	2006	2007	2008	2009
Number of workers	214,891	219,698	224,152	200,601



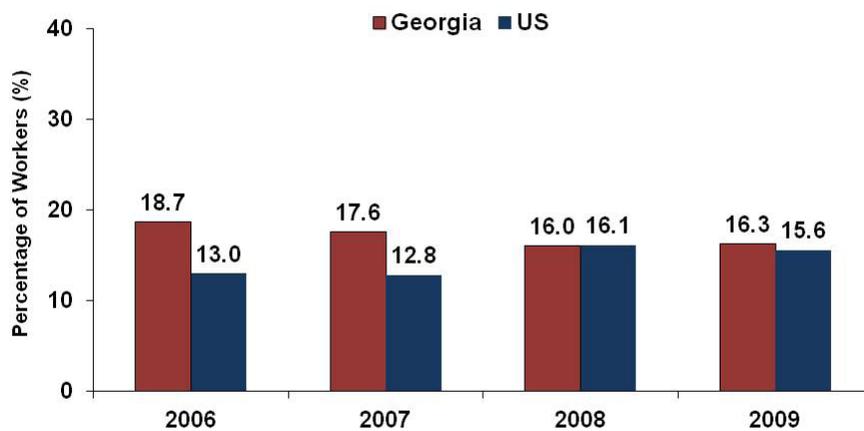
## Indicator 15: Workers employed in occupations at high risk for occupational morbidities, Georgia, 2006-2009

Risk of injuries and illnesses is also significantly higher in certain occupations compared to the national average.<sup>4</sup> These high risk occupations are listed in Appendix 3 and include the average number of persons who were employed in these occupations in Georgia in 2009. More than 500,000 Georgia workers were employed in occupations at high risk for occupational morbidities in 2009 (Table 15). The percentage of employed persons who worked in high risk occupations in Georgia decreased from 18.3% in 2006 to 16.3% in 2009 (Figure 19).

**Table 15. Number of workers employed in occupations at high risk for occupational morbidities, Georgia, 2006-2009**

	2006	2007	2008	2009
Number of workers	622,502	607,903	541,561	523,430

**Figure 19. Percentage of workers employed in occupations with high risk of occupational morbidity, Georgia and U.S., 2006-2009**



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

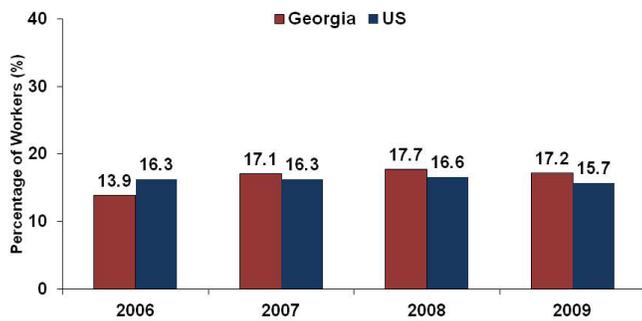
## Indicator 16: Workers employed in occupations and industries at high risk for occupational mortality, Georgia, 2006-2009

Risk of occupational fatalities is significantly higher in certain industries and occupations compared to the national average.<sup>4,10</sup> Between the years 2006-2009, an average of 172 workers in Georgia died as a result of injuries sustained on the job. These industries and occupations are listed in Appendix 4 and Appendix 5, respectively. In 2009, more than 600,000 workers in Georgia were employed in industries at high risk for occupational mortality. Almost 500,000 workers were employed in high risk fatality occupations in Georgia (Table 16). The percent of workers employed in these industries and occupations are presented in Figures 20 and 21.

**Table 16. Number of workers employed in industries and occupations at high risk for occupational mortality, Georgia, 2006-2009**

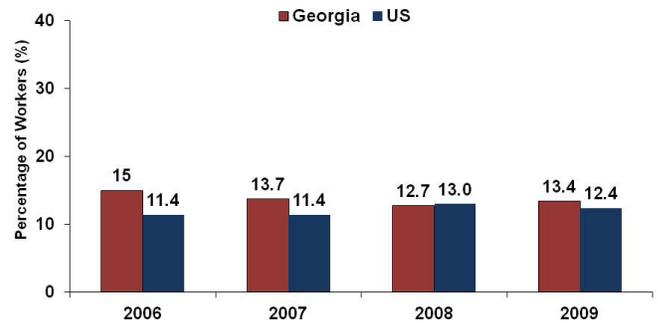
	2006	2007	2008	2009
Number of workers in high fatality risk industries	529,653	674,804	686,871	632,352
Number of workers in high fatality risk occupations	572,012	541,457	494,467	490,528

Figure 20. Percentage of workers employed in industries with high risk of occupational mortality, Georgia and U.S., 2006-2009



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

Figure 21. Percentage of workers employed in occupations with high risk of occupational mortality, Georgia and U.S., 2006-2009



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

## Indicator 17: Occupational Safety and Health Professionals, Georgia, 2006-2009

A sufficient number of trained occupational safety and health (OSH) professionals are needed to help prevent work-related injuries and illnesses. OSH professionals include occupational medicine physicians, occupational health nurses, industrial hygienists, and safety health professionals. These professionals provide primary, secondary, and tertiary occupational health preventive services, including workplace evaluations and safety assessments, onsite medical care, and treatment of injuries. The American Medical Association has recommended that there be at least one OSH physician per 1,000 employees.<sup>4</sup> Rates of OSH professional are monitored within each state to determine the need for increased education or recruitment activities.<sup>2,4</sup>

Estimated numbers of OSH professionals in Georgia during 2006-2009 were obtained from current rosters and directories of each cited professional organization and are shown in Table 17. The number of board certified OSH professionals has increased since 2006 in Georgia, except for occupational health nurses. The number of occupational health nurses decreased from 217 in 2006 to 185 in 2009. Table 18 shows the rate of OSH professionals per 100,000 employed persons in Georgia. In 2009, there were approximately two occupational health physicians, four occupational health nurses, four industrial hygienists, and eight safety health professionals per 100,000 employees in Georgia. The rate of OSH physicians in Georgia per 1,000 employees is 0.02, which is much lower than the American Medical Association's recommended rate. Rates of OSH professionals in Georgia were slightly lower than national rates during 2006-2009.

**Table 17. Estimated number of occupational safety and health professionals, Georgia, 2006-2009**

	2006	2007	2008	2009
Board-certified occupational medicine physicians	88	97	96	102
Members of the American College of Occupational and Environmental Medicine (ACOEM)	113	104	103	101
Board certified occupational health nurses	217	185	183	185
Nurse members of the American Association of Occupational Health Nurses (AAOHN)	302	268	238	218
Board-certified industrial hygienists	142	144	149	154
Industrial hygienist members of the American Industrial Hygiene Association	232	218	199	189
Board-certified safety health professionals	318	330	336	345
Safety engineer members of the American Society of Safety Engineers (ASSE)	753	817	796	745

**Table 18. Rate of occupational safety and health professionals per 100,000 employed persons Georgia and United States, 2006-2009**

	Georgia				United States			
	2006	2007	2008	2009	2006	2007	2008	2009
Board-certified occupational medicine physicians	2.0	2.1	2.1	2.4	1.8	1.9	1.9	2.2
Members of the American College of Occupational and Environmental Medicine (ACOEM)	2.5	2.2	2.3	2.3	3.3	3.1	3.0	3.0
Board-certified occupational health nurses	4.8	4.0	4.0	4.3	4.8	4.1	4.0	4.1
Nurse members of the American Association of Occupational Health Nurses (AAOHN)	6.7	5.8	5.2	5.0	6.1	5.8	5.4	4.6
Board-certified industrial hygienists	3.2	3.1	3.3	3.6	4.8	4.7	4.8	5.1
Industrial hygienist members of the American Industrial Hygiene Association	5.2	4.7	4.4	4.4	7.2	6.2	6.1	5.9
Board-certified safety health professionals	7.1	7.1	7.4	8.0	7.5	7.6	7.9	8.6
Safety engineer members of the American Society of Safety Engineers (ASSE)	16.8	17.6	17.4	17.2	22.0	21.5	22.0	21.5

## Indicator 18: OSHA Enforcement Activities, Georgia, 2006-2009

The federal Occupational Safety and Health Administration (OSHA) was established in 1970 with the mission to “assure as far as possible every working man and woman in the nation safe and healthful working conditions.”<sup>4</sup> Some of OSHA’s activities include standards development, enforcement, education, and compliance assistance. OSHA enforcement activities are measured through the number of inspections.<sup>4,10</sup> OSHA conducts both referral (i.e. from outside health agency or media) and non-referral inspections at worksites. Data on the number of inspections and workers covered under OSHA jurisdiction in Georgia were obtained from the Region IV OSHA Office. The Bureau of Labor Statistics on Covered Employees and wages data were used to estimate the number of Georgia workers employed and establishments in the public and private sectors.

The number of establishments under OSHA jurisdiction in Georgia increased from 260,209 in 2006 to 268,871 in 2009 (Table 19). The number of Georgia establishments that were inspected by OSHA remained fairly stable (around 1,500 establishments) during 2006-2009. This represents about 0.6% of establishments under OSHA jurisdiction that were inspected. These percents remained lower than the national average during 2006-2009. The total number of employees covered under OSHA jurisdiction decreased during 2006-2009, however the number of employees whose work areas were inspected by OSHA increased from 49,461 to 75,104 (Table 20). This resulted in an increased percentage of Georgia employees under OSHA jurisdiction whose work areas were inspected by OSHA (from 1.2% in 2006 to 2.0%) in 2009. These percents were lower than the national average during 2006-2009.

**Table 19. OSHA inspections among establishments, Georgia, 2006-2009**

	2006	2007	2008	2009
Number of establishments under OSHA jurisdiction	260,209	269,048	273,604	268,871
Number of establishments inspected by OSHA	1,519	1,529	1,452	1,500
Percent of establishments under OSHA jurisdiction inspected by OSHA	0.6%	0.6%	0.5%	0.6%
National percent of establishments under OSHA jurisdiction inspected by OSHA	1.3%	1.2%	1.2%	1.2%

**Table 20. OSHA inspections among employees, Georgia, 2006-2009**

	2006	2007	2008	2009
Number of employees under OSHA jurisdiction (excluding miners and farm workers)	4,003,673	4,056,604	4,012,043	3,777,968
Number of employees whose work areas were inspected by OSHA	49,461	50,380	57,512	75,104
Percent of employees under OSHA jurisdiction whose work areas were inspected by OSHA	1.2%	1.2%	1.4%	2.0%
National percent of employees under OSHA jurisdiction whose work areas were inspected by OSHA	3.4%	3.3%	3.5%	3.9%

## Indicator 19: Workers' Compensation Awards, Georgia, 2006-2009

In the event that an employee experiences a work-related injury or illness, medical expenses and some lost wages can be covered through workers' compensation benefits. All workers in Georgia are eligible for state workers' compensation, except for federal and self-employed employees. Workers' compensation awards can be used as a measure of the economic burden of occupational injuries and illnesses.<sup>4,10</sup> The estimated amount of workers' compensation awards in Georgia during 2006-2009 were obtained from the National Academy of Social Insurance. Workers' compensation benefits paid to Georgia workers with occupational injuries or illnesses increased from approximately \$1.2 billion in 2006 to \$1.5 billion in 2009 (Table 21). This represents an average of \$316 for every worker in Georgia who was eligible for workers' compensation in 2006 and \$416 for workers eligible in 2009.

**Table 21. Workers' compensation awards, Georgia, 2006-2009**

	2006	2007	2008	2009
Total amount of workers' compensation benefits paid	\$1,214,622,000	\$1,339,121,000	\$1,601,604,000	\$1,492,696,000
Average amount of workers' compensation benefits paid per covered worker	\$316	\$344	\$418	\$416

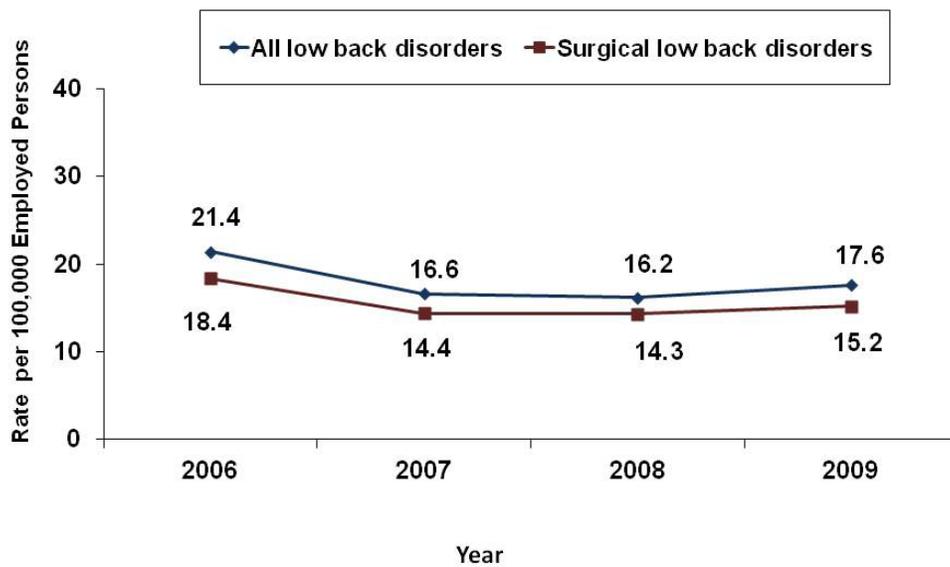
## Indicator 20: Work-related low back disorder hospitalizations, Georgia, 2006-2009

Approximately two-thirds of all low back pain cases are attributed to work-related activities. Hospitalizations due to low back pain result in high medical costs, high absenteeism, major impairment and disability, and reduced work performance and productivity. Nearly 40% of workers' compensation costs are due to low back pain. The burden of low back disorder hospitalizations can be reduced through prevention efforts implemented for high-risk job activities.<sup>4</sup> Hospital discharge data from the Georgia Hospital Association were used to estimate rates of low-back disorder hospitalizations among residents age 16 years and older during 2006-2009. In 2009, there were 763 low back disorder hospitalizations in Georgia for which workers' compensation was the primary payer. This was a decrease from the 965 low back disorder hospitalizations that occurred in 2006 (Table 22). The rate of hospitalizations per 100,000 employed persons decreased from 21.4 in 2006 to 17.6 in 2009 (Figure 22). Among the 763 low back disorder hospitalizations that occurred in 2009 in Georgia, 657 required surgery. The rate of surgical low back disorder hospitalizations per 100,000 employed persons decreased from 18.4 in 2006 to 15.2 in 2009. Rates of low back disorder hospitalizations in Georgia were similar to national rates in 2009 (Figure 23).

**Table 22. Number of work-related low back disorder hospitalization, Georgia, 2006-2009**

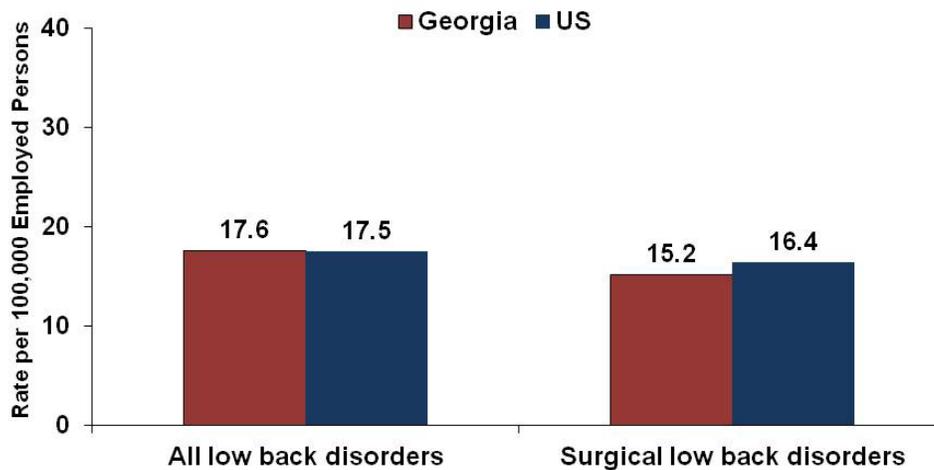
	2006	2007	2008	2009
Low back disorder hospitalizations	965	770	740	763
Surgical low back disorder hospitalizations	834	669	653	657

Figure 22. Rate of work-related low back disorder hospitalizations, Georgia, 2006-2009



\*U.S. data for 2009 may be unreliable  
Source: Georgia Hospital Discharge Data

Figure 23. Rate of work-related low back disorder hospitalizations, Georgia and U.S., 2009



Source: Georgia Hospital Discharge Data

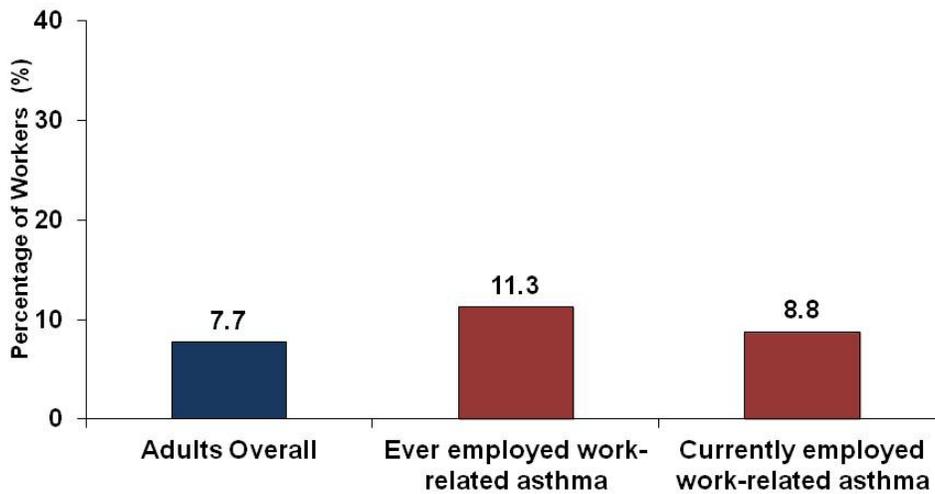
# State Specific Indicator: Work-Related Asthma, Georgia, 2006-2009

Work-related asthma (WRA) is an occupational lung disease that is preventable. Work-related asthma can be either existing asthma that is worsened by factors related to the environment of the workplace (work-exacerbated asthma) or a new onset of asthma attributed to the workplace environment (occupational asthma).<sup>11</sup> Examples of some chemicals associated with WRA by industry/occupation are listed in Appendix 6. Identification of WRA provides direct opportunities for prevention and intervention activities. Data combined from the 2006-2009 Georgia Behavioral Risk Factor Surveillance System (BRFSS) Asthma Call-back Surveys were used to estimate the percent of ever-employed adults in Georgia who have been told by a health professional that their asthma was work-related. The proportion of adults reported to have work-related asthma is likely to be underestimated because work-related asthma is underdiagnosed in the United States.<sup>11</sup> Overall, approximately 7.7% of adults in Georgia have doctor-diagnosed asthma. Among these adults, 11.3% of adults who were ever-employed and 8.8% (approximately 25,000 individuals) of adults who are currently employed have been told by a physician that their asthma was work-related (Figure 24). Among currently employed Georgia adults with WRA, 36.4% say that their asthma is made worse by their current job and 18.4% say that their asthma is caused by their current job (Figure 25). WRA is higher among current employees who are female, non-Hispanic black, aged 35-54 years, and who earn less than \$25,000 annually (Table 17). Occupational conditions can be improved to reduce or prevent WRA among employees. Targeted strategies to reduce or eliminate workplace exposures for persons with WRA, such as substituting chemicals or engineering and administrative controls, will aid in the prevention of new onset asthma cases and slow the progression of work-exacerbated asthma.<sup>11</sup>

**Table 17. Proportion (%) of currently employed adults with work-related asthma, Georgia, 2006-2009**

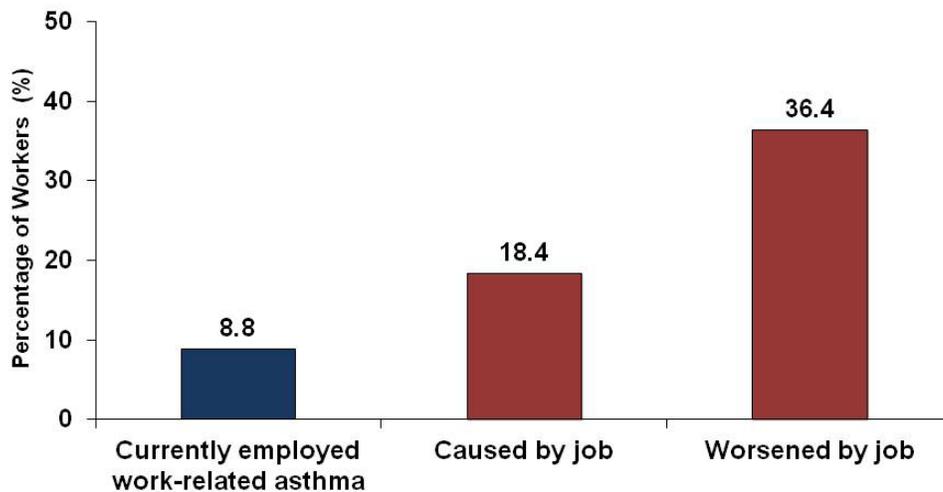
<b>Overall</b>	8.8%
<b>Sex</b>	
Male	5.8%
Female	10.8%
<b>Race/Ethnicity</b>	
White, non-Hispanic	8.4%
Black, non-Hispanic	11.1%
<b>Age Group (years)</b>	
18-34	5.4%
35-54	11.8%
55+	7.0%
<b>Income (annual)</b>	
≤\$24,999	17.4%
\$25,000-\$49,999	7.4%
\$50,000	7.9%

Figure 24. Proportion of adults with work-related asthma, Georgia, 2006-2009



Source: Georgia BRFSS Asthma Call-Back Survey

Figure 25. Proportion of currently employed adults with work-related asthma, Georgia, 2006-2009



Source: Georgia BRFSS Asthma Call-Back Survey

# State Specific Indicator: Arthritis among Employees, Georgia, 2009

Arthritis is the most frequent cause of disability in the United States, affecting nearly 46 million adults. It is a painful condition consisting of approximately 100 diseases and is known to cause work limitations.<sup>12</sup> Data from the 2009 Georgia Behavioral Risk Factor Surveillance System (BRFSS) was used to estimate the prevalence of employees in Georgia who had doctor-diagnosed arthritis (including osteoarthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia). An estimated 15.7% of employees in Georgia had doctor-diagnosed arthritis (approximately 715,000 individuals). About 18.2% of female employees were diagnosed with arthritis while about 13.5% of male employees were diagnosed with arthritis. Prevalence of arthritis increased with age; employees aged 45-54, 55-64, and 65+ were significantly more likely to be diagnosed with arthritis than employees in younger age groups. About 18.9% of non-Hispanic white employees were diagnosed with arthritis compared to 11.7% of non-Hispanic black employees and 10.5% of Hispanic employees. The burden of arthritis is higher among employees with an annual household income less than \$50,000 (Table 18). About 23% (approximately 160,000 individuals) of employees said that arthritis or joint symptoms affects whether they work, the type of work they do, or the amount of work they do. This measure of arthritis-attributable work limitation shows that a considerable number of Georgia employees can benefit from interventions that include simple workplace accommodations such as flexible work schedules, ergonomic work stations, and efforts to promote maintaining a healthy weight and physical activity; all of which may help ease the pain of arthritis. As the workforce ages, due to employees working longer, it is increasingly more important to have arthritis interventions, such as arthritis-management education classes, available as well as health and disability insurance.<sup>13</sup>

<b>Table 18. Prevalence (%) of currently employed adults with arthritis, Georgia, 2009</b>	
<b>Overall</b>	15.7%
<b>Sex</b>	
Male	13.5%
Female	18.2%
<b>Race/Ethnicity</b>	
White, non-Hispanic	18.9%
Black, non-Hispanic	11.7%
Hispanic	10.5%
<b>Age Group (years)</b>	
18-44	7.9%
45-54	22.2%
55-64	36.7%
65+	43.3%
<b>Income (annual)</b>	
≤\$24,999	17.1%
\$25,000-\$34,999	16.1%
\$35,000-\$49,999	17.9%
\$50,000+	14.6%

# State Specific Indicator: Workplace Secondhand Smoke Exposure, Georgia, 2009-2010

Secondhand smoke is a known major contributor to indoor air pollution and is known to cause lung cancer, chronic conditions, and diseases of the respiratory and cardiovascular systems.<sup>14,15</sup> In 2006, the U.S. Surgeon General reported there is no safe level of secondhand smoke exposure.<sup>14</sup> Although, there is much knowledge about the impact of secondhand smoke on the body, many non-smoking employees are still exposed to the dangers of secondhand smoke on the job. Data from the 2009-2010 National Adult Tobacco Survey (NATS) were used to estimate the percent of non-smoking employees in Georgia who were exposed to secondhand smoke at work (indoor or outdoor). Approximately 18.7% of non-smoking Georgia employees (approximately 488,000 individuals) were exposed to secondhand smoke at work during the past seven days prior to the survey. Exposure to secondhand smoke was higher among employees who were male, were between ages 18-34 years, or earned an annual income less than \$70,000 (Table 19). Construction workers, blue collar workers, and service workers are among some of the groups who experience high levels of secondhand smoke exposure compared to other workers.<sup>15</sup> “Eliminating smoking in indoor spaces is the only way to fully protect nonsmokers from secondhand smoke exposure. Separating smokers from nonsmokers, cleaning the air, and ventilating buildings do not eliminate secondhand smoke exposure.”<sup>14,15</sup>

Adoption of model smoke-free workplace policies can protect workers from the health effects of secondhand smoke exposure by prohibiting indoor smoking, smoking in company owned vehicles, and smoking at outdoor company worksites where two or more employees are working. Smoke free workplace policies also lead to more efficient work environments as they have been shown to reduce worker absenteeism, cleaning and maintenance costs, health insurance premiums, liability claims, and cigarette consumption.<sup>14,16</sup>

**Table 19. Prevalence (%) of non-smoking employees exposed to secondhand smoke at work , Georgia, 2009-2010**

<b>Overall</b>	18.7%
<b>Sex</b>	
Male	21.7%
Female	15.4%
<b>Race/Ethnicity</b>	
White, non-Hispanic	20.4%
Black, non-Hispanic	17.8%
Hispanic	12.6%
<b>Age Group (years)</b>	
18-34	27.1%
35-44	16.0%
45-54	11.7%
55+	11.9%
<b>Income (annual)</b>	
≤\$29,999	20.7%
\$30,000-\$49,999	23.0%
\$50,000-\$69,999	22.8%
\$70,000+	12.4%

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# Data Sources and Limitations

## Survey of Occupational Injuries and Illnesses

The Survey of Occupational Injuries and Illnesses (SOII) is an annual sample survey of employers conducted by the U.S. Department of Labor, Bureau of Labor and Statistics (BLS). Employers are surveyed on all employee work-related injuries and illnesses that resulted in one or more days away from work, death, loss of consciousness, restricted work, or medical treatment beyond first aid. The survey provides estimated numbers and incidence rates of work-related injuries and illnesses among private sector workers at the state and national levels. **Limitations:** The SOII uses a probability sample and is not a census of all employers. Therefore, it is subject to sampling error. In addition, employers are only required to report on up to 30 cases; which means all cases may not be reported if an employer has over 30 cases. The military, self-employed individuals, farms with fewer than 11 employees, and federal agencies are excluded from the survey.

## Georgia Hospital Discharge Data

Records of patient discharges from all licensed non-federal acute care inpatient facilities in Georgia are collected by the Georgia Hospital Association (GHA). Only discharges of Georgia residents who were seen in a Georgia facility are included. Information about patient demographics, diagnoses, and source of payment are included. Since the data does not include specific information about work-relatedness, the proxy of workers' compensation coded as the primary payer is used to indicate a work-related hospitalization. **Limitations:** The majority of individuals with work-related illnesses do not file for workers' compensation. Self-employed and federal employees are not covered by state workers' compensation. Individuals can be counted more than once if readmitted. Discharges include both people living and who have died.

## Census of Fatal Occupational Injuries

The Census of Fatal Occupational Injuries (CFOI) is a federal-state cooperative program conducted by the U.S. Department of Labor, Bureau of Labor Statistics (BLS) in all 50 states and the District of Columbia that provides counts of fatal work injuries. In order for the fatality to be included in the census the person must have been working at the time of the incident, engaged in work activity, or present the incidents site as required by the job. CFOI covers private wage and salary workers, the self-employed, and public sector workers. To provide the most complete data as possible, CFOI uses multiple sources (including death certificates, workers' compensation reports, police and medical examiner reports, and news reports) to identify and verify fatal worker injuries. Some of the information collected includes occupation, equipment involved, and circumstances of the event. **Limitations:** CFOI publishes findings according to the Occupational Injury and Illness Classification (OIIC) system rather than the International Classification of Diseases (ICD) system. Thus, CFOI data may not be comparable to causes of death documented on death certificates. CFOI reports work-related fatalities by the state in which the incident occurred, not by state of residence. Since the denominator data used to calculate rates are based on state of residence, state rates may be overestimated or underestimated, depending on whether incidents occur in-state or out-of-state. Also, fatalities of people younger than 16 years may be included in the numerator but are not included in the denominator data.

## Georgia Vital Records

Mortality data from the Georgia Department of Public Health's Office of Vital Records were used to determine numbers of pneumoconiosis deaths. The Vital Records Office maintains the death certificates of all deaths occurring in the state. Deaths of Georgia residents are included, regardless of the state in which the death occurred. Causes of death are coded according to the 10<sup>th</sup> revision of the International Classification of

Diseases (ICD-10). **Limitations:** Death certificates identify only a small percentage of people who have pneumoconiosis. The cause of death listed on the death certificate and coding of those causes may not be accurate. Also, the number of contributing causes of death listed on deaths certificates varies by the person completing the record. Persons whose death is due to a work-related illness or injury may not have been exposed in the state where the death occurred. Georgia mortality data were not available for 2009 due to data quality.

## American Association of Poison Control Centers/Georgia Poison Control Center

Numbers of pesticide poisonings in the state were obtained from the American Association of Poison Control Centers (AAPCC), which administers the Toxic Exposure Surveillance System. The Georgia Poison Center (GPC) and all other state poison control centers report statewide data to the AAPCC. The Georgia Poison Center (GPC) has operated a 24-hour poison emergency treatment information service since 1970. The GPC provides assistance and expertise in the medical diagnosis and management of human and animal poisonings. GPC is one of the busiest and most up-to-date front-line toxicology information centers in the nation. In 2009, the GPC received 115,669 calls into its emergency phone service lines (about 317 calls per day). **Limitations:** All poisonings are not reported to the poison center. Since the data in this report includes only persons who called the GPC, the number of pesticide poisonings reported may be underestimated.

## Georgia Comprehensive Cancer Registry

The Georgia Comprehensive Cancer Registry (GCCR) was used to determine the incident number of malignant mesothelioma cases in the state. The GCCR is a statewide population-based cancer registry that collects all cancer cases newly diagnosed among Georgia residents. The Georgia Department of Public Health has designated the Georgia Center for Cancer Statistics

at the Rollins School of Public Health at Emory University as its agent for collecting and editing cancer data. Data collection for the GCCR began in 1995. GCCR participates in the National American Association of Central Cancer Registries (NAACCR), which provides ongoing development and cancer registries and the establishment of registry standards. GCCR is gold certified by NAACCR as high quality. An evaluation of GCCR showed that 100% of cancer cases are true cases. The cancer registry data also represents 98% of Georgia's population. **Limitations:** Since cancer is a disease of long latency, current incidence is not indicative of current exposures. The residence of the case may not have been the state of exposure. Not all cases of malignant mesothelioma are caused by occupational exposures.

## Adult Blood Lead Epidemiology and Surveillance Program

The Georgia Adult Blood Lead Epidemiology and Surveillance (ABLES) program is a state-based surveillance program, funded through the CDC National Institute for Occupational Safety and Health (NIOSH), that collects clinical laboratory-reported adult blood lead levels of Georgia persons aged 15 years or older. The program collects and analyzes data to identify the incidence and prevalence of elevated blood lead levels in the adult population to measure trends in lead exposure and effectively intervene to prevent lead over-exposures. **Limitations:** The elevated blood lead cases in this report are all report cases, which may include both occupational and non-occupational exposures. The rates reported may be overestimated if some cases were not due to occupational exposures. Some elevated blood-levels due to occupational exposures may not be captured. Though employers are required by the Occupational Health Safety Administration (OSHA) to provide blood lead testing for exposed workers, all employers do not provide testing. Also, individuals who are self-employed may not get tested.

## Georgia Board of Workers' Compensation

The number of amputations and carpal tunnel syndrome claims filed through workers' compensation were obtained from the Georgia Board of Workers' Compensation (GBWC). Established by the Georgia legislature in 1920, more than 3.8 million Georgia workers are covered by the workers' compensation law which provides for specific benefits to be paid to employees who sustain work-related injuries or illnesses, such as replacement for a portion of lost wages, medical payments, vocational rehabilitation services, and other benefits. Georgia law requires that all employers, including public corporations and nonprofit organizations that have at least three full-time or part-time employees, to have workers' compensation insurance coverage. **Limitations:** Federal employees, railroad employees, farmers and farm laborers, self-employed individuals, and domestic servants are not covered by workers' compensation. Also, the majority of eligible workers who have a work-related injury or illnesses do not file for state workers' compensation.

## Georgia Behavioral Risk Factor Surveillance System

The Georgia Behavioral Risk Factor Surveillance System (BRFSS) was used to estimate the prevalence of arthritis among employees and the BRFSS Asthma Call-back Survey (ACBS) was used to estimate the proportion of work-related asthma. Established by the Centers and Disease Control and Prevention (CDC) in 1984, the BRFSS is a cross-sectional random-digit-dialed telephone survey of non-institutionalized civilian adults age 18 years and older conducted annually in all 50 states, the District of Columbia, Puerto Rico, Guam, and the U.S. Virgin Islands. This state-based surveillance system collects information on health risk behaviors, preventive health practices, and healthcare access primarily related to chronic disease and injury. BRFSS respondents who said they work full-time, part-time, or have been out of work for less than a year and who said 'yes' to having ever been told by a doctor or other health professional that they have some form of arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia

were considered employees with doctor-diagnosed arthritis. BRFSS respondents who said yes to ever being diagnosed with asthma are asked to participate in the ACBS. Administered since 2006, the ACBS collects detailed information on asthma, including symptoms, health-care utilization, medication use, knowledge of asthma, cost of asthma care, work-related asthma, comorbid conditions, and complementary and alternative medicine use for asthma. **Limitations:** Prevalence estimates of arthritis may be underestimates of the true burden because all employees with arthritis may not have been diagnosed. Also, the BRFSS is based on self-reported data; therefore, results may be subject to recall bias. The ACBS may be subject to self-selection bias, since ACBS participants are BRFSS respondents who agreed to be called-back. These participants may have more severe asthma or be more likely to attribute asthma to their work. Information on work-relatedness is not available in BRFSS for those who refused to participate.

## National Adult Tobacco Survey

State-level data from the National Adult Tobacco Survey (NATS) was used to estimate the prevalence of employees exposed to secondhand smoke at work. The NATS, administered for the first time in 2009-2010, is a cross-sectional random-digit dialed telephone survey of non-institutionalized civilian adults age 18 years and older. The survey was designed with the purpose of obtaining representative data on key outcome indicators at state and national levels for monitoring and evaluating progress toward the goals of the CDC's National Tobacco Control Program. The NATS includes questions relating to general health, tobacco use, smoking cessation, smoke-free and tobacco-free policies, existing chronic conditions and diseases, and opinions and attitudes related to tobacco and policy. **Limitations:** The NATS is based on self-reported data; therefore, results may be subject to recall bias.



## Georgia Population and Civilian Employment Demographics, Aged 16 Years and Older, 2010

	Population	Civilian Employment
<b>Total Number</b>	7,383,453	4,238,000
<b>Sex</b>		
Male	48.4%	52.8%
Female	51.6%	47.2%
<b>Age Group</b>		
16-17 years	3.8%	0.5%
18-64 years	83.5%	96.2%
65+ years	12.7%	3.3%
<b>Race</b>		
White	61.7%	68.5%
Black	29.6%	27.3%
Other*	5.2%	4.2%
<b>Hispanic origin*</b>		
Hispanic	7.6%	8.7%

\* Persons of Hispanic origin may be of any race (white, black, other)

\*Other includes Asians, American Indians, Alaskan Natives/Pacific Islanders

## Appendix 2

### Average Number of Employees in Industries at High Risk\* for Morbidity, Georgia, 2009

NAICS Industry Title	Average Number
Cotton Ginning	600
Sugarcane Milling	0
Fluid Milk Manufacturing	750
Animal Slaughtering Except Poultry	1,750
Rendering and Meat Byproduct Processing	560
Seafood Canning	10
Soft Drink and Ice Manufacturing	1,685
Leather and Hide Tanning and Finishing	60
Truss manufacturing	970
Wood Container and Pallet Manufacturing	1,624
All Other Wood Product Manufacturing	2,732
Tire Retreading	375
Porcelain Electrical Supply Manufacturing	10
Concrete Pipe Manufacturing	270
Other Concrete Product Manufacturing	2,291
Rolling and Drawing of Purchased Steel	368
Secondary Smelting and Alloying of Aluminum	175
Foundries	946
Forging and Stamping	1,755
Kitchen Utensil, Pot, and Pan Manufacturing	0
Architectural and Structural Metals Manufacturing	11,351
Other Metal Container Manufacturing	60
Other Fabricated Wire Product Manufacturing	448
Precision Turned Product Manufacturing	788
Industrial Pattern Manufacturing	60
All Other Miscellaneous Fabricated Metal Product Manufacturing	1,239
Agricultural Implement Manufacturing	4,857
Sawmill and Woodworking Machinery Manufacturing	99
Paper Industry Machinery Manufacturing	127
Food Product Machinery Manufacturing	845

NAICS Industry Title	Average Number
Commercial Laundry, Dry Cleaning, and Pressing Machine Manufacturing	60
Industrial and Commercial Fan and Blower Manufacturing	175
Overhead Traveling Crane, Hoist, and Monorail System Manufacturing	60
Light Truck and Utility Vehicle Manufacturing	60
Heavy Duty Truck Manufacturing	750
Motor Vehicle Body and Trailer Manufacturing	2,089
Motor Vehicle Seating and Interior Trim Manufacturing	375
Motor Vehicle Metal Stamping	679
Ship and Boat Building	1,750
Metal Household Furniture Manufacturing	76
Institutional Furniture Manufacturing	859
Beer, Wine, and Distilled Alcoholic Beverage Wholesalers	5,319
Pet and Pet Supplies Stores	2,428
Air Transportation	31,323
Marine Cargo Handling	3,707
Other Support Activities for Transportation	149
Couriers and Messengers	368
Refrigerated Warehousing and Storage	59
Veterinary Services	15,798
Other Ambulatory Health Care Services	6,821
Specialty Hospitals Except Psychiatric and Substance Abuse	7,205
Nursing and Residential Care Facilities	62,162
Spectator Sports	3,642
Skiing Facilities	0
Special Food Services	17,882
<b>Total</b>	<b>200,601</b>

Data Source: U.S. Census Bureau County Business (CBP) Patterns.

NAICS = North American Industry Classification System (NAICS)

\*High Risk Based on Bureau of Labor Statistics (BLS) "total reportable cases incidence rates"

\*Data in this table are limited to the private sector workforce only. Farms, self-employed, public administration, and state/federal government are not included.

# Appendix 3

## Average Number of Employees in Occupations at High Risk\* for Morbidity, Georgia, 2009

2002 BOC Occupation Title	Average Number
Athletes, coaches, umpires, and related workers	10,356
Emergency medical technicians and paramedics	4,144
Nursing, psychiatric, and home health aides	37,534
First-line supervisors/managers of correctional officers	0
Police and sheriff patrol officers	0
Transit and railroad police	1,189
Animal control workers	0
Food servers, non-restaurant	2,208
First-line supervisors/managers of landscaping, lawn service, and grounds keeping	1,632
Janitors and building cleaners	32,595
Maids and housekeeping cleaners	39,375
Nonfarm animal caretakers	3,752
Transportation attendants	15,478
Reservation and transportation ticket agents and travel clerks	1,618
Meter readers, utilities	2,906
Forest and conservation workers	1,066
Boilermakers	1,269
Brick masons, block masons, and stonemasons	1,441
Carpenters	33,350
Construction laborers	51,961
Pile-driver operators	1,001
Glaziers	0
Pipe layers, plumbers, pipefitters, and steamfitters	7,696
Reinforcing iron and rebar workers	0
Roofers	10,809
Structural iron and steel workers	294
Highway maintenance workers	1,737
Miscellaneous construction and related workers	1,022
Mining machine operators	0
Roof bolters, mining	0
Aircraft mechanics and service technicians	10,705
Automotive glass installers and repairers	778

2002 BOC Occupation Title	Average Number
Automotive service technicians and mechanics	20,507
Bus and truck mechanics and diesel engine specialists	8,141
Heating, air conditioning, and refrigeration mechanics and installers	12,667
Industrial and refractory machinery mechanics	11,878
Telecommunications line installers and repairers	8,522
Coin, vending, and amusement machine servicers and repairers	0
Welding, soldering, and brazing workers	9,694
Lay-out workers, metal and plastic	0
Model makers and patternmakers, wood	0
Sawing machine setters, operators, and tenders, wood	1,955
Stationary engineers and boiler operators	1,360
Cementing and gluing machine operators and tenders	0
Cleaning, washing, and metal pickling equipment operators and tenders	0
Cooling and freezing equipment operators and tenders	0
Etchers and engravers	0
Molders, shapers, and casters, except metal and plastic	1,121
Paper goods machine setters, operators, and tenders	2,076
Tire builders	551
Helpers--production workers	0
Production workers, all other	31,774
Bus drivers	9,610
Driver/sales workers and truck drivers	81,170
Taxi drivers and chauffeurs	6,209
Railroad conductors and yardmasters	0
Subway, streetcar, and other rail transportation workers	2,377
Sailors and marine oilers	0
Hoist and winch operators	0
Laborers and freight, stock, and material movers, hand	36,798
Shuttle car operators	1,105
<b>Total</b>	<b>523,430</b>

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

\*BOC = Bureau of Census Code

\*High Risk based on Bureau of Labor Statistics "days away from work" cases

\*Data in this table are limited to the private sector workforce only. Farms, self-employed, public administration, and state/federal government are not included.

## Appendix 4

### Average Number of Employees in Industries at High Risk for Occupational Mortality, Georgia, 2009

2007 Census Industry Title	Average Number
Crop Production	34,070
Animal Production	9,934
Forestry, Except Logging	1,673
Logging	8,102
Fishing, Hunting, Trapping	0
Support Activities for Agriculture and Forestry	818
Oil and Gas Extraction	0
Coal Mining	0
Metal Ore Mining	0
Nonmetallic Mineral Mining and Quarrying	1,450
Support Activities for Mining	1,269
Construction	337,414
Animal Food, Grain, and Oilseed milling	2,580
Sugar and Confectionery Products	1,736
Miscellaneous Petroleum and Coal Products	0
Cement, Concrete, Lime, and Gypsum Product Mfg.	5,437
Iron and Steel Mills and Steel Product Mfg.	5,619
Nonferrous Metal Production and Processing (Except Aluminum)	1,860
Foundries	524
Ship and Boat Building	291
Sawmills and Wood Preservation	1,494

2007 Census Industry Title	Average Number
Veneer, Plywood, and Engineered Wood Product Mfg.	656
Recyclable Material Wholesalers	0
Farm Product Raw Materials Wholesalers	0
Farm supplies wholesalers	816
Wholesale Electronic Markets, Agents, and Brokers	1,162
Rail Transportation	16,219
Water Transportation	1,006
Truck Transportation	71,452
Taxi and Limousine Service	9,849
Pipeline Transportation	1,487
Scenic and Sightseeing Transportation	1,660
Services Incidental to Transportation	33,817
Sound Recording Industries	1,905
Other Consumer Goods Rental	6,543
Commercial, Industrial, and Other Intangible Assets Rental and Leasing	2,896
Landscaping Services	42,682
Waste Management and Remediation Services	8,799
Drinking Places, Alcoholic Beverages	5,845
Commercial and Industrial Machinery and Equipment Repair and Maintenance	11,286
<b>Total</b>	<b>632,352</b>

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

\*High Risk based on the Bureau of Labor Statistics' Census of Fatal Occupational Injuries (CFOI)

\*Data in this table are limited to the private sector workforce only and includes self-employed workers

# Appendix 5

## Average Number of Employees in Occupations at High Risk for Occupational Mortality, Georgia, 2009

2007 Census Occupation Title	Average Number
Farmers and Ranchers	11,117
Athletes, Coaches, Umpires, and Related Workers	10,356
Announcers	0
Fire Fighters	0
Security Guards and Gaming Surveillance Officers	25,040
Crossing Guards	0
First-line supervisors/managers of landscaping, lawn service, & grounds-keeping workers	8,485
Pest Control Workers	3,599
Grounds Maintenance Workers	39,970
Tour and Travel Guides	341
First-line Supervisors/Managers of Farming, Fishing, and Forestry Workers	3,057
Miscellaneous Agricultural Workers	20,072
Fishers and Related Fishing Workers	0
Logging Workers	2,405
First-line Supervisors/Managers of Construction Trades and Extraction Workers	15,732
Boilermakers	1,269
Brick masons, Block masons, and Stonemasons	1,441
Cement Masons, Concrete Finishers, and Terrazzo Workers	924
Construction Laborers	66,720
Paving, Surfacing, and Tamping Equipment Operators	1,607
Operation Engineers and Other Construction Equip. Ops.	5,471
Electricians	23,575
Glaziers	0
Insulation Workers	0
Painters, Construction and Maintenance	15,730
Roofers	12,983
Structural Iron and Steel Workers	294
Helpers, Construction Trades	1,347
Highway Maintenance Workers	1,737
Miscellaneous Construction and Related Workers	1,282
Derrick, Rotary Drill, and Service Unit Operators, Oil, Gas, and Mining	0
Earth Drillers, Except Oil and Gas	0

2007 Census Occupation Title	Average Number
Mining Machine Operators	0
Roustabouts, Oil and Gas	0
Other Extraction Workers	0
First-line Supervisors/Managers of Mechanics, Installers, and Repairers	10,787
Bus and Truck Mechanics and Diesel Engine Specialists	10,357
Heavy Vehicle and Mobile Equipment Service Technicians and Mechanics	9,087
Maintenance and Repair Workers, General	6,136
Maintenance Workers, Machinery	2,090
Millwrights	0
Electronic Power-line Installers and Repairers	3,521
Riggers	0
Molders and Molding Machine Setters, Operators, and Tenders, Metal Plastic	853
Welding, Soldering, and Brazing Workers	9,694
Chemical Processing Machine Setters, Operators, and Tenders	0
Aircraft Pilots and Flight Engineers	7,368
Driver/Sales Workers and Truck Drivers	99,073
Taxi Drivers and Chauffeurs	11,527
Motor Vehicle Operators, All Other	2,972
Locomotive Engineers and Operators	4,023
Railroad Brake, Signal, and Switch Operators	0
Railroad Conductors and Yardmasters	0
Sailors and Marine Oilers	0
Ship and Boat Captains and Operators	2,324
Ship Engineers	0
Service Station Attendants	924
Conveyor Operators and Tenders	1,173
Crane and Tower Operators	2,317
Industrial Truck and Tractor Operators	27,094
Refuse and Recyclable Material Collectors	2,380
Material Moving Workers, All Other	2,273
Total	490,528

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

\*High Risk based on the Bureau of Labor Statistics' Census of Fatal Occupational Injuries (CFOI)

\*Data in this table are limited to the private sector workforce only and includes self-employed workers

# Appendix 6

## Chemicals Associated with Occupational Asthma

Chemical Name	Alternate Name	Occupation or Industry
<b>Acrylates &amp; Methacrylates</b>		
Ethyl cyanoacrylate	Ethyl-2-cyanoacrylate	Building airplane models
Methyl 2-cyanoacrylate		Using adhesives
Ethyl methacrylate		Manicurist
Methyl methacrylate		Nurse
Ethoxylated bisphenol A diacrylate		Autobody shop worker
<b>Metals</b>		
Aluminum		Solderer
Chromium and compounds		Printer, plater, welder, tanner
Cobalt		Hard metal grinder, diamond polisher
Nickel and compounds		Metal plating; welder
Palladium		Assembly line worker
Platinum		Platinum refinery
Tungsten carbide		Grinder
Zinc chloride fume		Solderer
<b>Aldehydes</b>		
Formaldehyde		Hospital staff
Glutaraldehyde	Cidex	Hospital endoscopy unit
<b>Amines</b>		
Ethylenediamine	1,2-Diaminoethane	Shellac handler; photographer
Hexamethylene tetramine		Lacquer handler
N,N-Dimethyl-1,3-propanediamine	DMAPA	Ski manufacturer
Triethylene tetramine		Manufacturing aircraft filters
EPO 60		Mold maker
Trimethylhexanediamine + Isophorondiamine		Floor covering material salesman
4-Methylmorpholine		Manufacturing polyurethane foam
Piperazine dihydrochloride		Pharmaceutical and chemical manufacturing
p-Phenylene diamine		Fur dyeing
Ethanolamine	2-Aminoethanol	Beauty culture
N,N-Dimethylethanolamine		Spray painter
N-(2-hydroxyethyl) ethylenediamine	Aminoethylethanolamine	Solderer; cable jointer
Triethanolamine		Metal worker

Chemical Name	Alternate Name	Occupation or Industry
<b>Acid Anhydrides</b>		
Chlorendic anhydride		Mechanic
Hexahydrophthalic anhydride		Chemical worker
Himic anhydride		Manufacturing flame retardant
Maleic anhydride		Manufacturing polyester resin
Methyltetrahydrophthalic anhydride		Using curing agent
Phthalic anhydride		Producing resins
Pyromellitic dianhydride		Using epoxy adhesives
Tetrachlorophthalic anhydride		Using epoxy resins
Trimellitic anhydride		Using epoxy resins
<b>Preservatives/Disinfectants</b>		
Benzalkonium chloride		Using cleaning product
1,2-Benzisothiazolin-3-one		Chemical manufacturing
Chloramine T		Chemical manufacturing; brewery; janitorial/cleaning
Chlorhexidine	Hibiclens	Nurse
Hexachlorophene		Hospital staff
Isononanoyl oxybenzene sulfonate		Laboratory technician
Lauryl dimethyl benzyl ammonium chloride		Using floor cleaner
Methylchloro-isothiazolinone		Chemical manufacturing
<b>Isocyanates</b>		
Dicyclohexylmethane 4,4-diisocyanate	Hydrogenated MDI	Manufacturing polyurethane products
Hexamethylene diisocyanate	HDI	Spray painter
Isophorone diisocyanate	IPDI	Spray painter
Methylene bisphenyl isocyanate	MDI; Diphenylmethane diisocyanate	Foundry
Naphthalene diisocyanate	NDI	Rubber manufacturing
Polymethylene polyphenyl isocyanate	PPI	Paint shop worker
Toluene diisocyanate	TDI	Producing polyurethanes; floor varnisher
<b>Plastic &amp; Rubber Dusts</b>		
Azodicarbonamide	1,1'-Azobisformamide	Rubber and plastic manufacturing
Plexiglass (dust)	Lucite; Methyl methacrylate polymer;	Factory worker
Polyvinyl chloride (heated)		Meat wrapper's asthma

Chemical Name	Alternate Name	Occupation or Industry
Polyvinyl chloride (dust)		Manufacturing bottle caps
Polyethylene (heated)		Paper wrapper's asthma
Polypropylene (heated)		Manufacturing bags
<b>Pyrolysis Products</b>		
Rosin core solder	Rosin flux pyrolysis products	Electronics worker; manufacturing solder flux
Zinc chloride fume		Solderer; locksmith
<b>Fungicides</b>		
Bis(tri-n-butyltin)oxide	Tributyltin oxide	Exposure to carpet deodorizer
Captafol	Difolatan	Chemical manufacturing
Chlorothalonil	Tetrachloroisophthalonitrile	Farmer
<b>Other Chemicals</b>		
Aluminum smelting	Yet to be identified substance or mixture (? aluminum, ? fluorides) that can cause "potroom asthma" in workers at electrolytic reduction facilities	Potroom worker
Ammonium persulphate		Hairdresser
Diazonium salt	e.g., diazonium tetrafluoroborate and p-diethylaminobenzenediazonium chloride;	Manufacturing photocopy paper; manufacturing fluorine polymer precursor
Dioctyl-phthalate		PVC production worker
Drugs		Pharmacist; pharmaceutical worker
Ethylene Oxide		Nurse
Furfuryl alcohol		Foundry mold making; wool dye house
Ninhydrin		Laboratory worker
Nitrogen chloride		Indoor pool lifeguards
Oil mist, mineral	Metalworking or machining fluids, cutting oils (may contain numerous additives and contaminants)	Toolsetter and automobile plant
Styrene		Plastics factory
Sulfites		Water plant; food processor
Tetramethrin		Exterminator
Tetrazene		Detonator manufacturing
Textile dyes		Textiles, dye manufacturing
Triglycidyl isocyanurate		Spray painter
Urea formaldehyde	Kaurit S	Resin and foam manufacturing

Source: <http://www.haz-map.com/OA1.html>



