

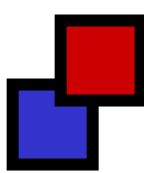
# Seeing "I" to "I": Injuries and Illnesses at Work



Terry Bunn  
Svetla Slavova  
Medearis Robertson



# KY Occupational Injuries and Illnesses Surveillance Program

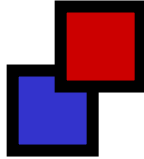
- 13 states funded by CDC/NIOSH to conduct surveillance of 13 indicators of occupational injuries and illnesses
  - State-specific indicator for occupational motor vehicle collision injuries
- 

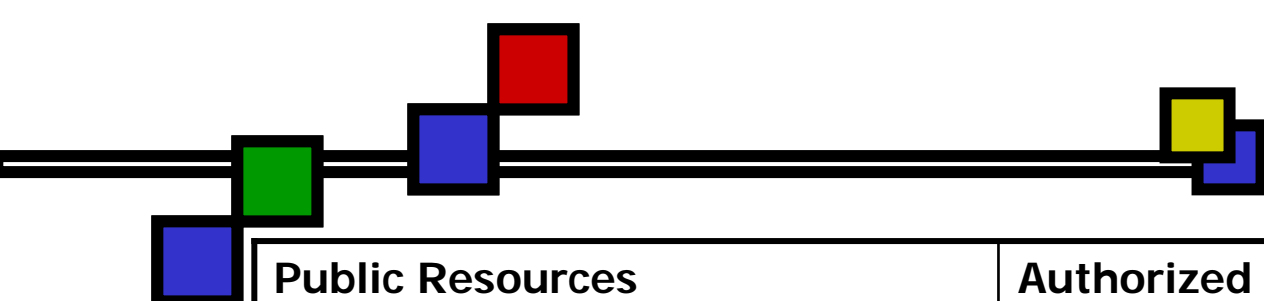


■ Goal:

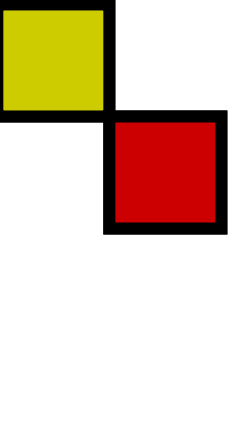
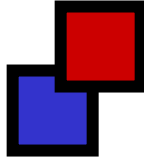
- Target and unite resources from existing health surveillance systems to establish a state-wide population-based occupational safety and health surveillance program

■ Objectives:

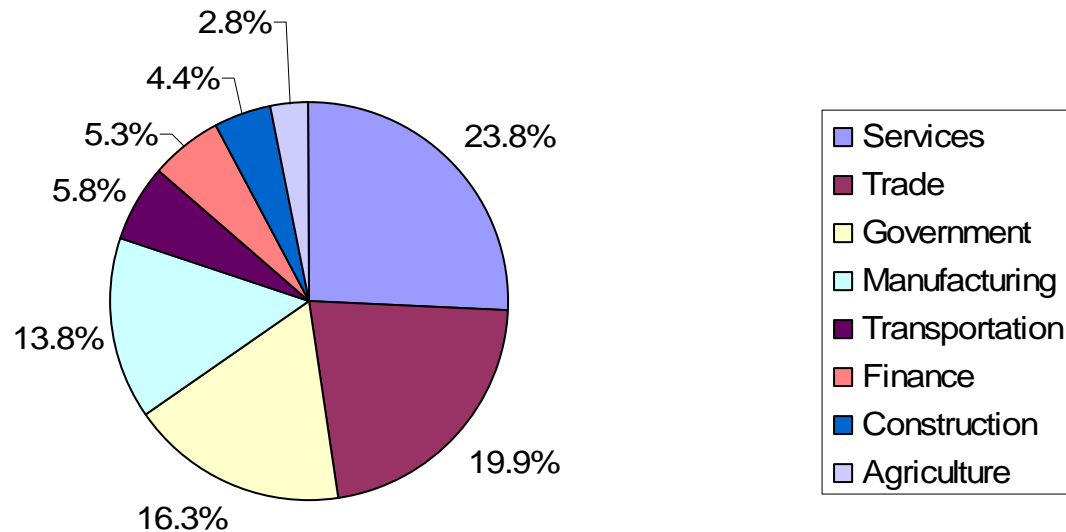
- Identify worker populations and environments at risk for nonfatal and fatal worker injuries and illnesses
  - Identify risk factors for an occupational injury
  - Develop strategies for dissemination of state occupational health data
- 



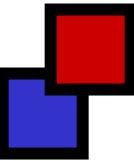
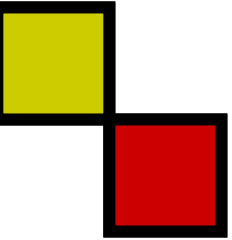
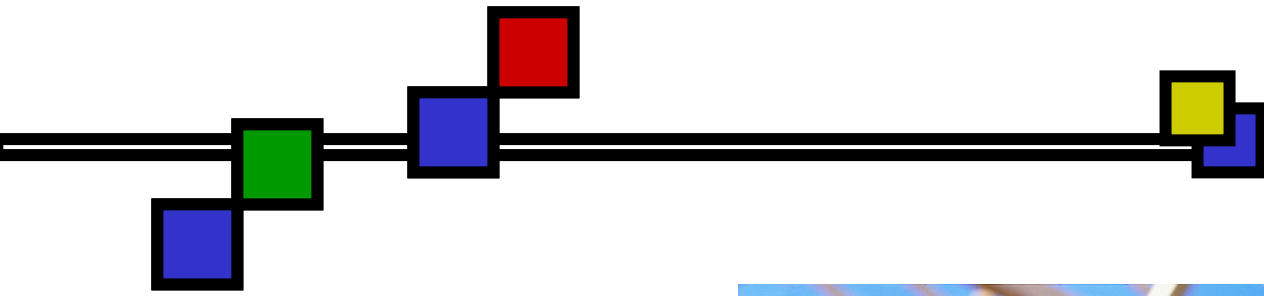
Public Resources	Authorized Resources
BLS Survey of Occupational Injuries and Illnesses	Kentucky Hospital Discharge Data
BLS Current Population Survey	Vital Statistics data (death certificates)
YEAR 2000 US Standard Population	Workers' Compensation system
US Census State Population Data	Kentucky Adult Blood Lead Epidemiology Surveillance (ABLES)
National Academy of Social Insurance Worker (NASI) estimate	FACE data
CFOI	CRASH data
	Kentucky Cancer Registry data
	Poison Control Center data

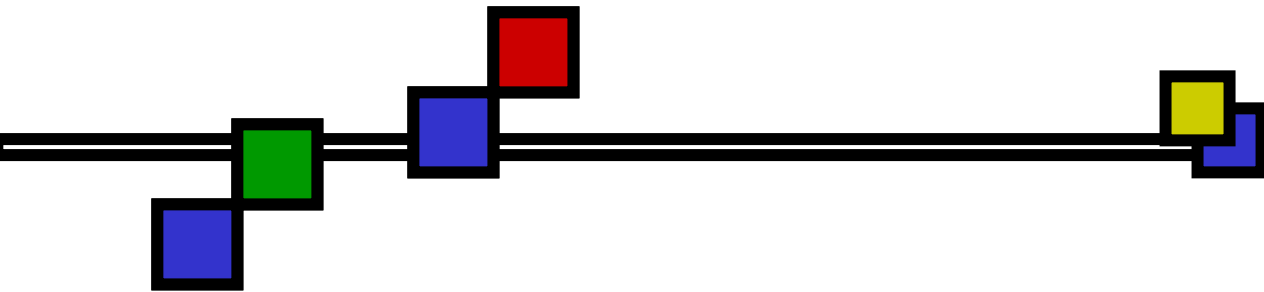



# Employment Demographics, 2002: 1,857,000 people aged 16 and older employed in Kentucky

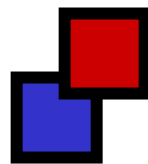


Data Source: Bureau of Labor Statistics (BLS) Geographic Profiles of  
Employment and Unemployment

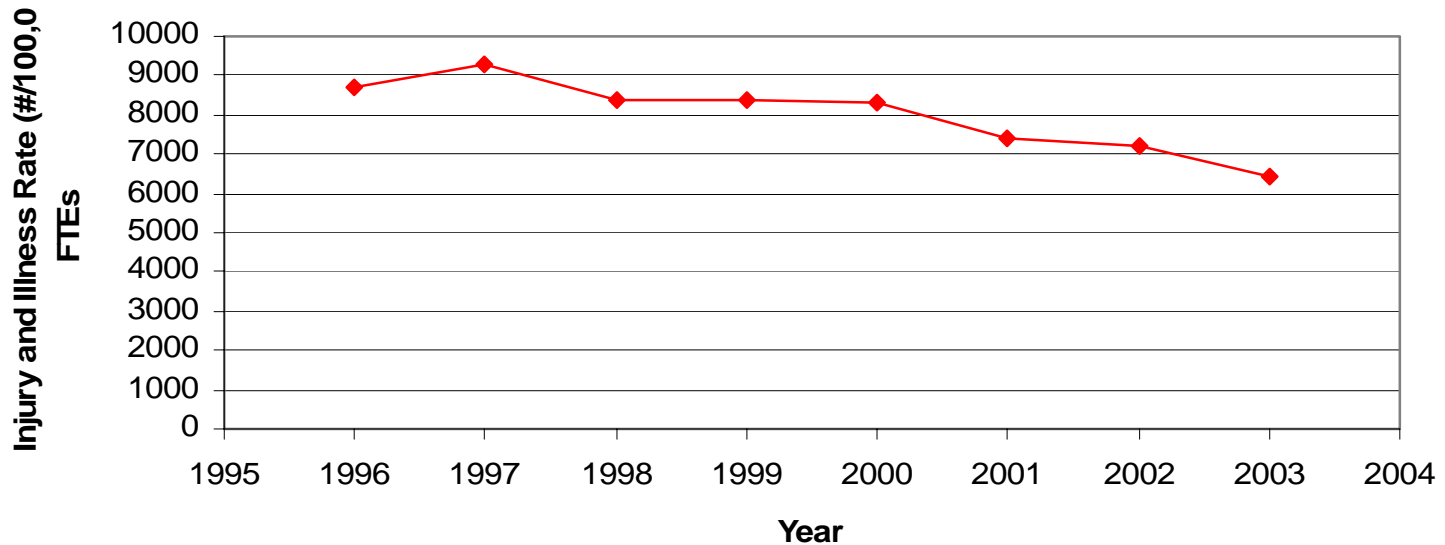




# Indicator #1: Non-fatal Work-related Injuries and Illnesses Reported by Employers

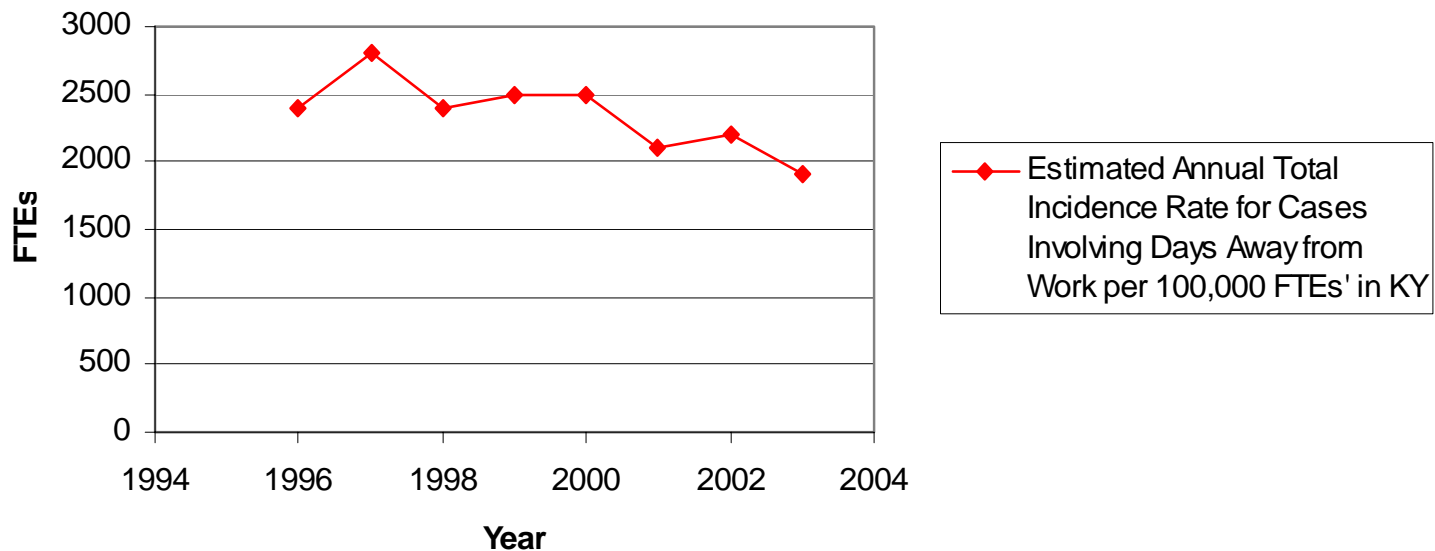


# Estimated Annual Total Work-related Injury and Illness Incidence Rates (1996-2003)



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

# Annual Incidence Rates for Cases Involving Days Away From Work



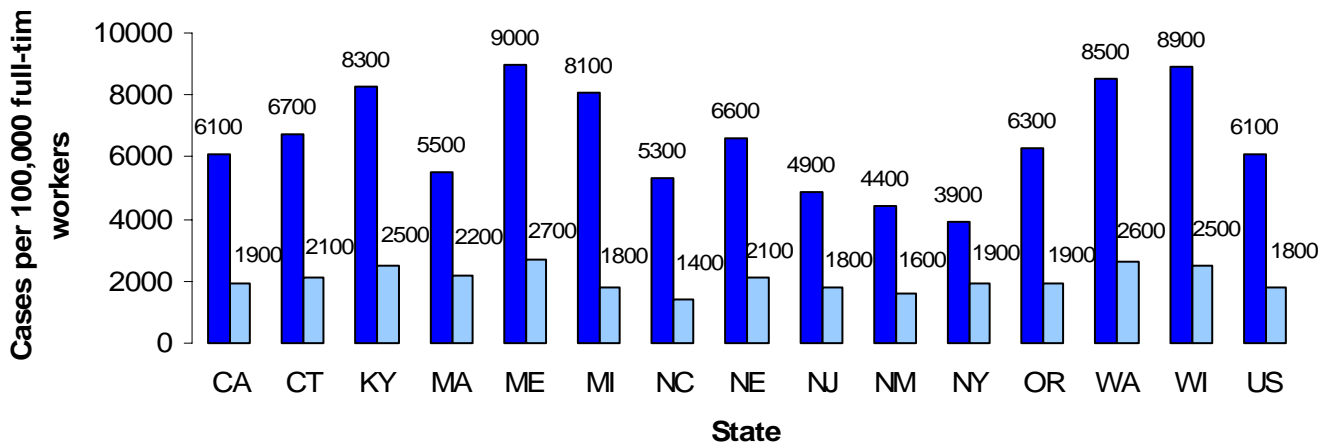
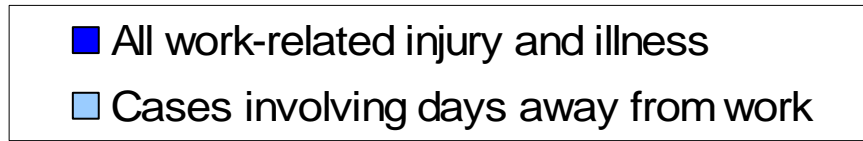
Data Source: Annual BLS Survey of Occupational Injuries and Illnesses (SOII)

**Lost Wages Due to Nonfatal Occupational Injuries and Illnesses Involving Days Away From Work by Industry Division in Year 2002.**

Industry Division (SIC Code)	Average Salary for 2002	Salary Per Day	Number Of Cases With Days Away From Work	Median Days Away From Work	Median Earnings Lost Per Worker
Construction	\$33,271.00	\$91.15	2522	9	\$820
Manufacturing	\$26,393.00	\$72.31	6402	8	\$578
Transportation/Communications/ Public Utilities	\$38,691.00	\$106.00	2567	10	\$1,060
Retail Trade	\$19,713.00	\$54.01	4050	5	\$270
Services	\$21,808.00	\$59.75	6316	6	\$358
Agriculture/Forestry/Fishing	\$30,727.00	\$84.18	484	5	\$421
Wholesale Trade	\$57,478.00	\$157.47	2673	7	\$1,102
Mining	\$22,171.00	\$60.74	1096	33	\$2,005

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

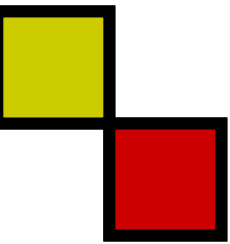
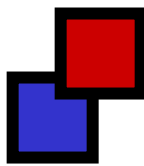
# Rate of Non-fatal Work-related Injuries and Illnesses Reported by Private Sector Employers by State and US, 2000.



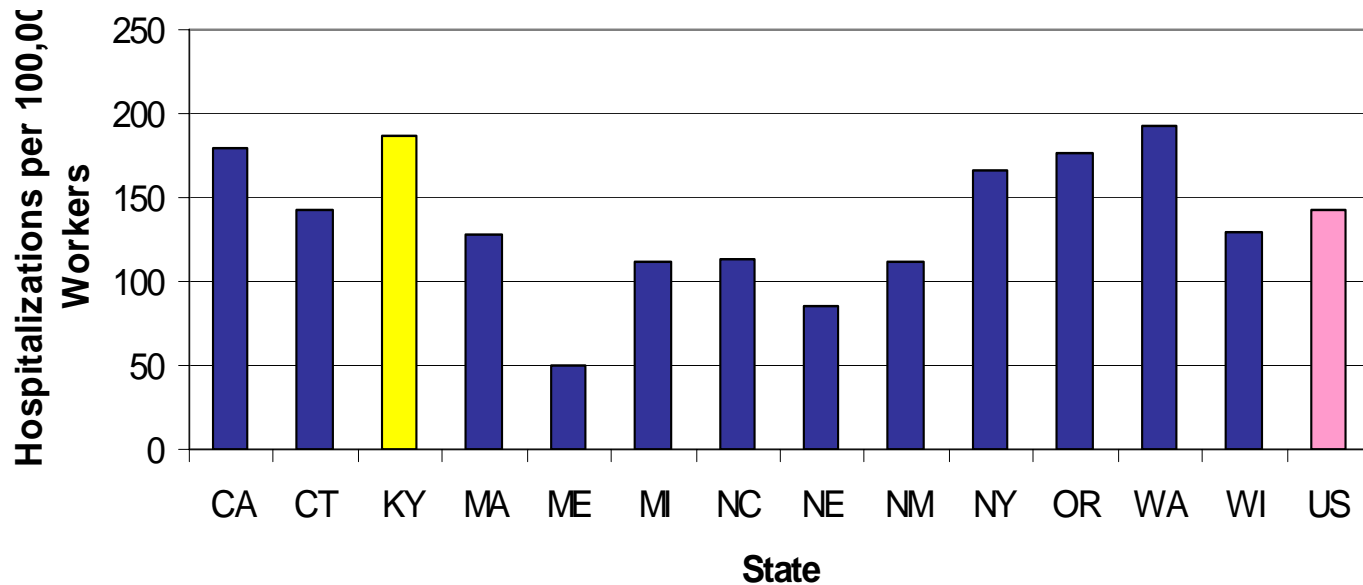




## Indicator 2: Work-related Hospitalizations

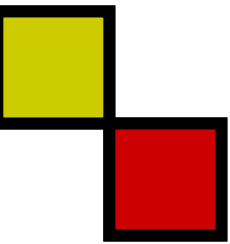
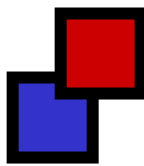
- 3858 work-related hospitalizations in 2002
  - Annual hospitalization rate of 208/100,000
    - ↑ from 187/100,000 in year 2000
- 
- 

# Rate of Work-related Hospitalizations by State and US, 2000.



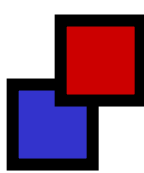


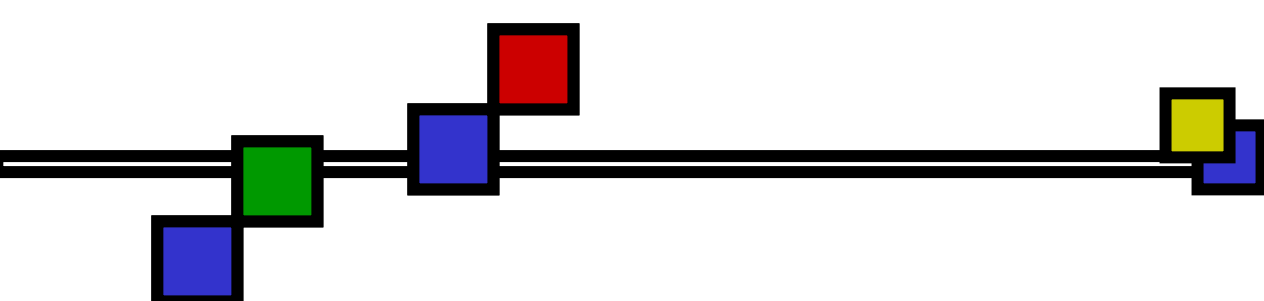
## Most Common Primary Diagnoses

- 
- Intervertebral Disc Disorders- 454 cases
  - Cellulitis and Abscess- 105 cases
  - Unspecified Disorders of Back- 98 cases
  - Osteoarthritis- 76 cases
  - Fractures of Tibia, Fibula, or Ankle- 73 cases
- 

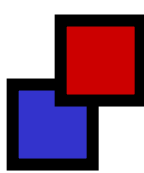


# Hospitalization Costs in Year 2004

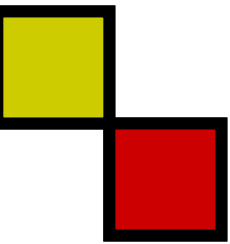
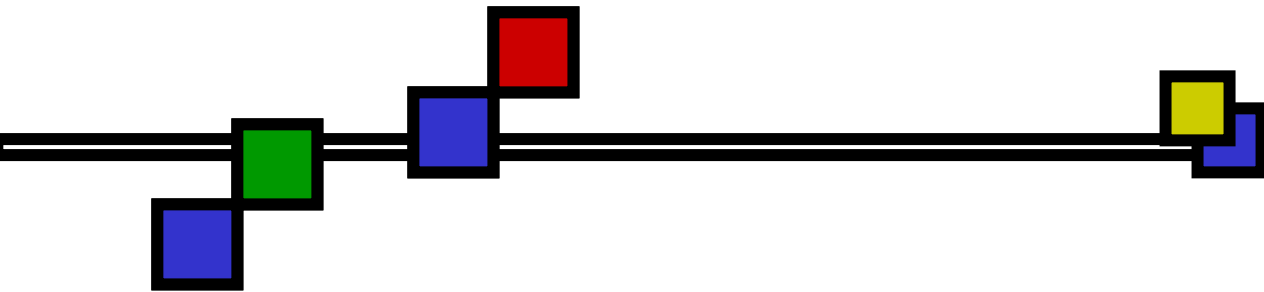
- Highest total costs were for male workers with intervertebral disc disorders- \$8,184,032
  - Highest average costs were for 16-24 year old male workers with cellulitis and/or abscesses- \$31,474
- 



# Primary External Cause of Work-related Hospitalizations

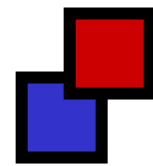
- Falls- 289 cases (highest total hospitalization costs were for male workers suffering falls- \$5,175,365 )
  - Motor Vehicle Collisions- 112 cases (highest average hospitalization costs were for 25-34 year old women in MVCs- \$101,458)
  - Struck By/Against- 77 cases
- 



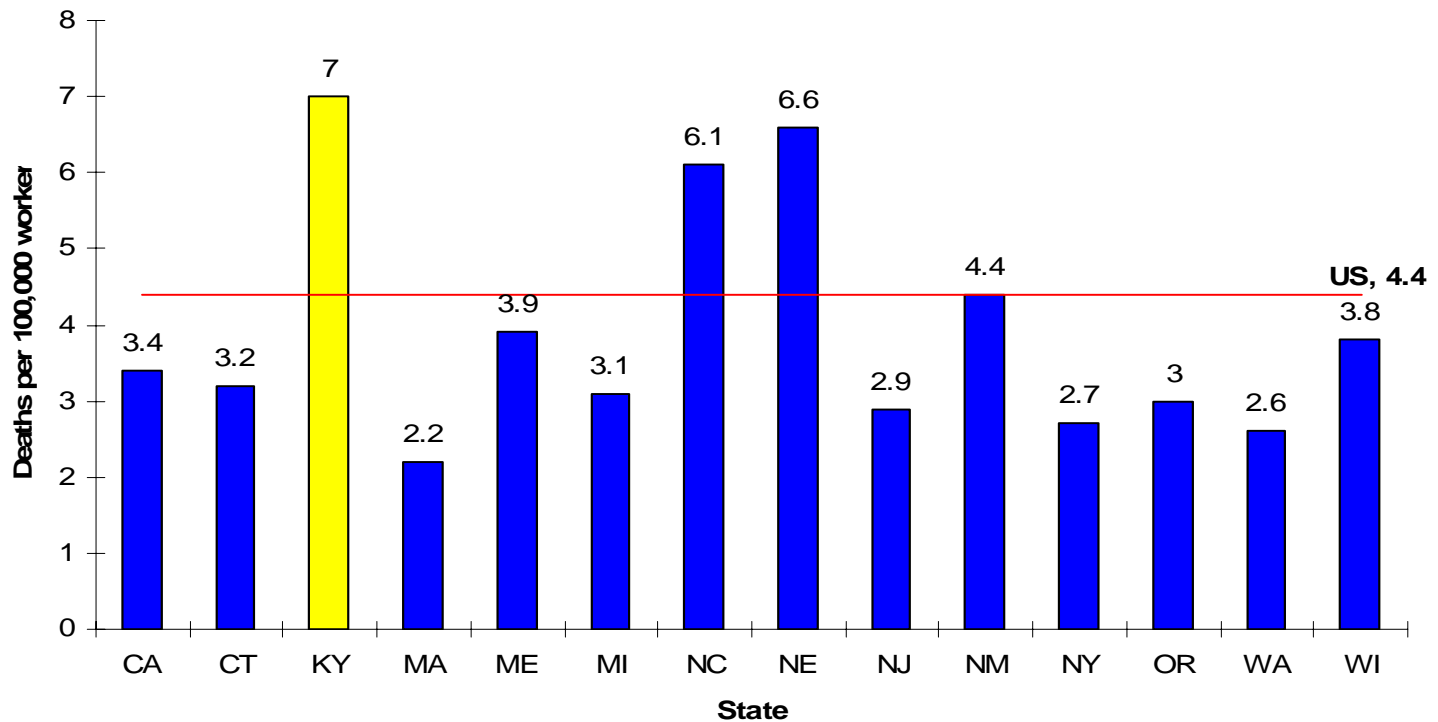


# Indicator #3- Fatal Work-Related Injuries

- 128 work-related fatalities in 2004



# Rate of Fatal Work-Related Injuries by State and U.S., 2000.



**Occupational Fatality Rates<sup>a</sup> by Industry (per 100,000 workers<sup>b</sup>) in Year 2003.**

Industry <sup>c</sup>	Number of Fatalities	2001 KY Rate <sup>d</sup>	2002 KY Rate	2003 KY Rate	US Rate <sup>e</sup>
Agriculture/Forestry/Fishing	24	51	40	46	22.7
TCPU*	26	19	17	24	11.3
Construction	25	16	23	31	12.2
Mining	12	65	59	70	23.5
Manufacturing	18	3	5	7	3.1
Services	11	2	4	2	1.7
Public Administration	7	3	2	2	2.7
Retail/Wholesale Trade	8	2	4	2	2.5
Finance	0	2	1	-	1.0
<b>Totals</b>	131	6.0	6.5	7.0	4.0

<sup>a</sup>FACE surveillance data

<sup>b</sup>Percent distribution of employed persons obtained from 1) *Geographic Profile of Employment and Unemployment*, Bureau of Labor Statistics; 2) US DOE-EIA; Coal Industry Annual; 3) KY FACE Program Annual Report, Kentucky Injury Prevention & Research Center, Lexington, KY.

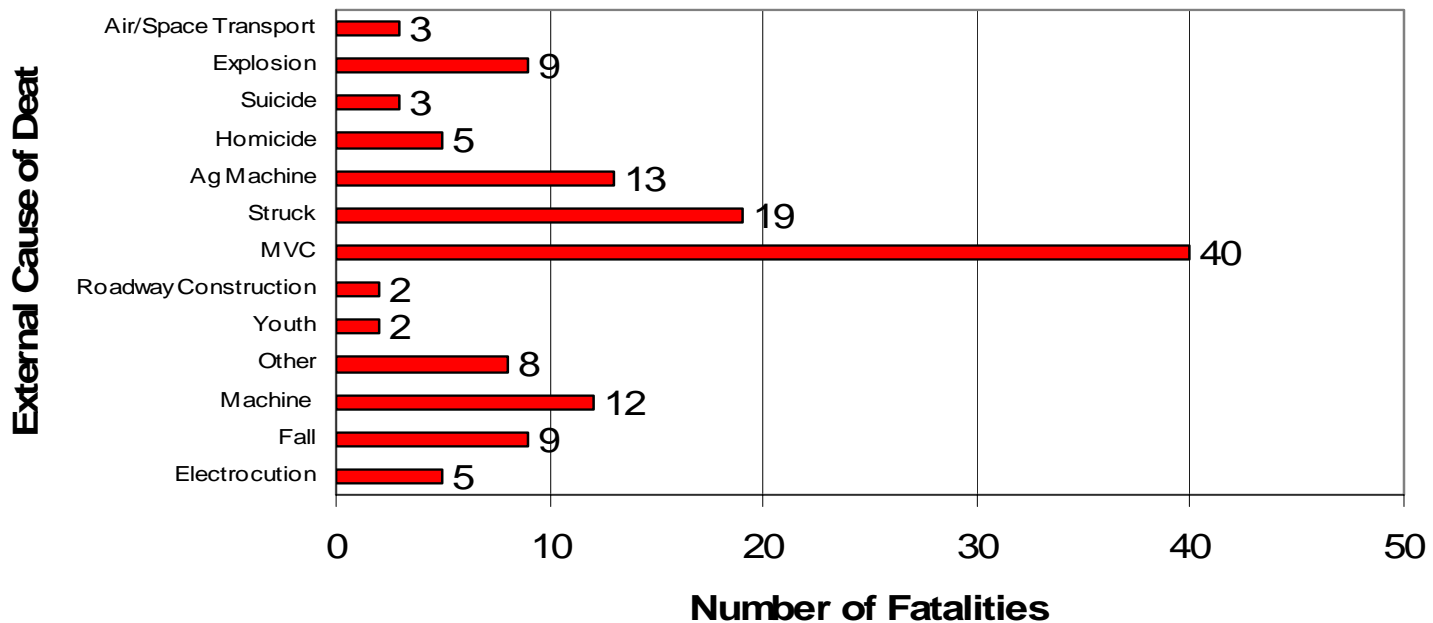
<sup>c</sup>Office of Management and Budget. Standard Industrial Classification Manual 1987. Springfield, VA: National Technical Information Service (NTIS No. PB 87-100012).

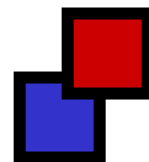
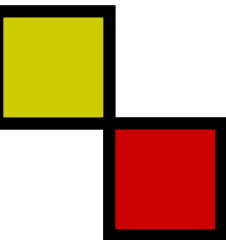
<sup>d</sup>The industries listed do not equal 100 percent of employed persons because of rounding and do not include private household workers, self-employed and unpaid family workers which comprise the remainder of employed persons (6 percent).

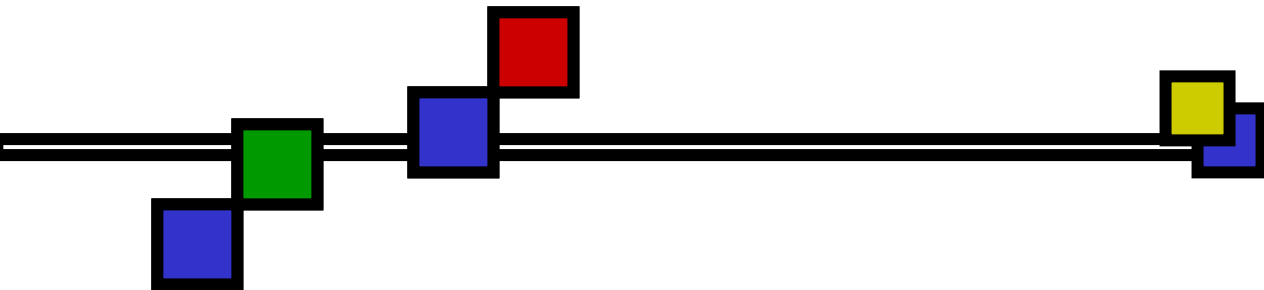
<sup>e</sup>Census of Fatal Occupational Injuries Summary. US Dept. of Labor, Bureau of Labor Statistics, National Census of Fatal Occupational Injuries Summary. NAICS coding for industry was used in 2003 so fatality rates may not be directly comparable to 2002 and 2003.

\*Transportation/Communications/Public Utilities

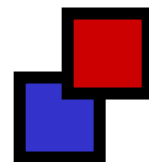
# Occupational Fatalities by External Cause of Death- 2003



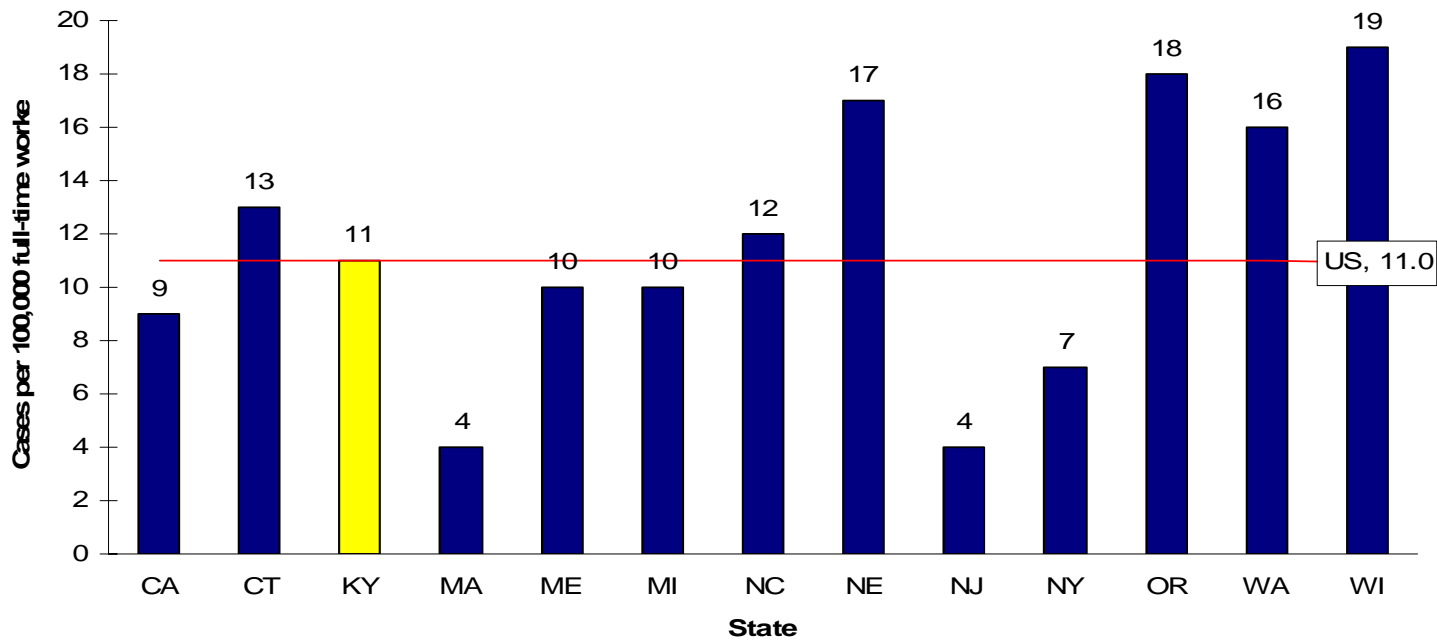




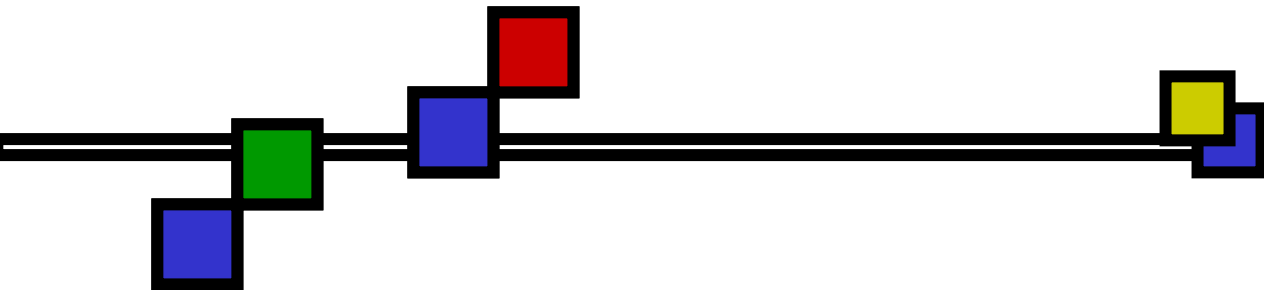
Indicator # 4: Work-related  
Amputations With Days Away  
From Work Reported by  
Employers



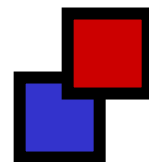
# Rate of Work-related Amputations Involving Days Away From Work Reported By Private Sector Employers by State and U.S., 2000.



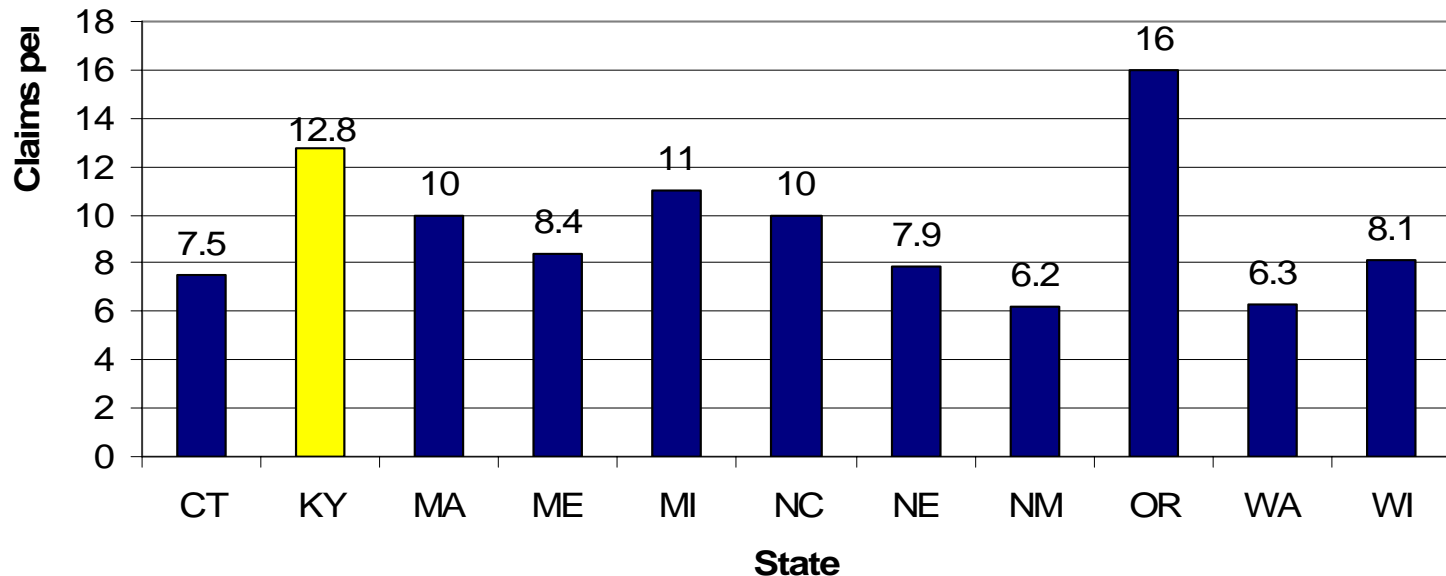




# Indicator #5: Amputations Filed With the State Workers' Compensation System



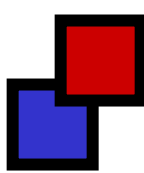
# Rate of Lost Work Time Claims for Amputations Identified in Workers' Compensation Systems by State, 2000.

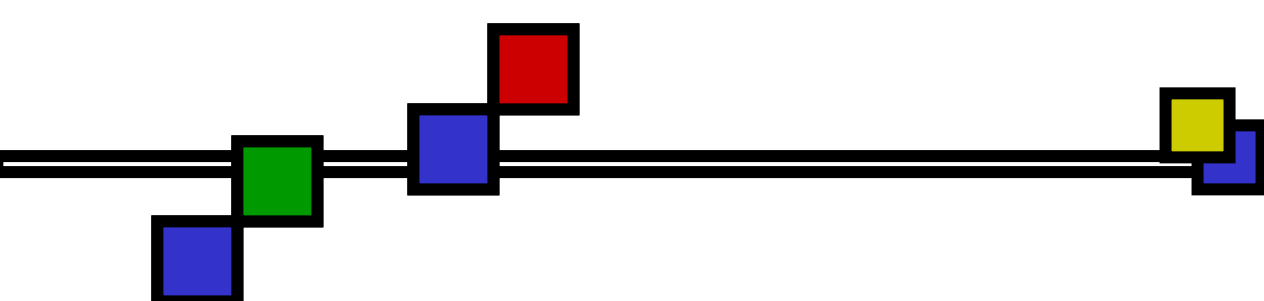


Data Source: Work-related amputation surveillance data was provided by the Kentucky Office of Workers' Claims, Frankfort, KY.

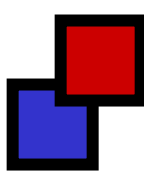


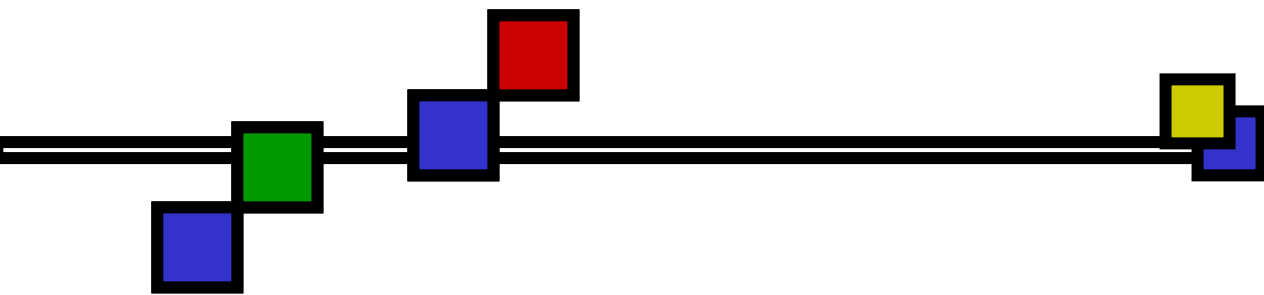
# Major Industries With Amputations, 2000-2004

- Bituminous coal underground mining (n=50)
  - Help supply service (n=48)
  - Motor vehicle parts and accessories (n=35)
  - Sawmills and planing mills (n=25)
  - Plastic products (n=22)
- 



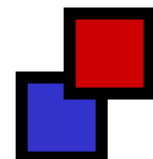
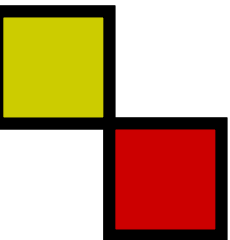
# Occupations with Amputations, 2000-2004

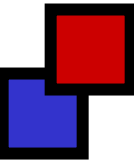
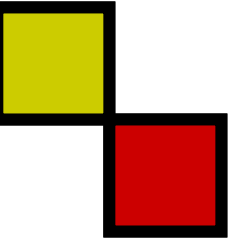
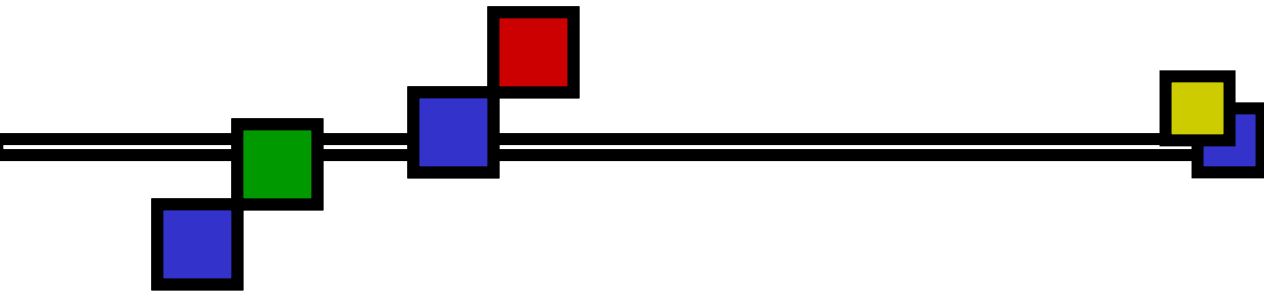
- Machine operators (n=177)
  - Assemblers (n=32)
  - Freight stock material handlers (n=22)
  - Mechanics and Repairers (n=22)
  - Truck drivers (n=21)
- 

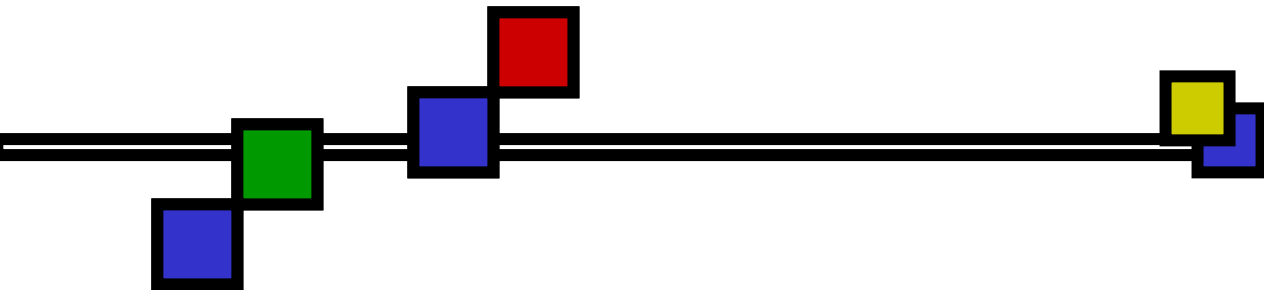


# Most Common Amputations

- Fingers (n=768)
- Thumbs (n=116)

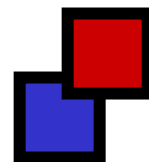




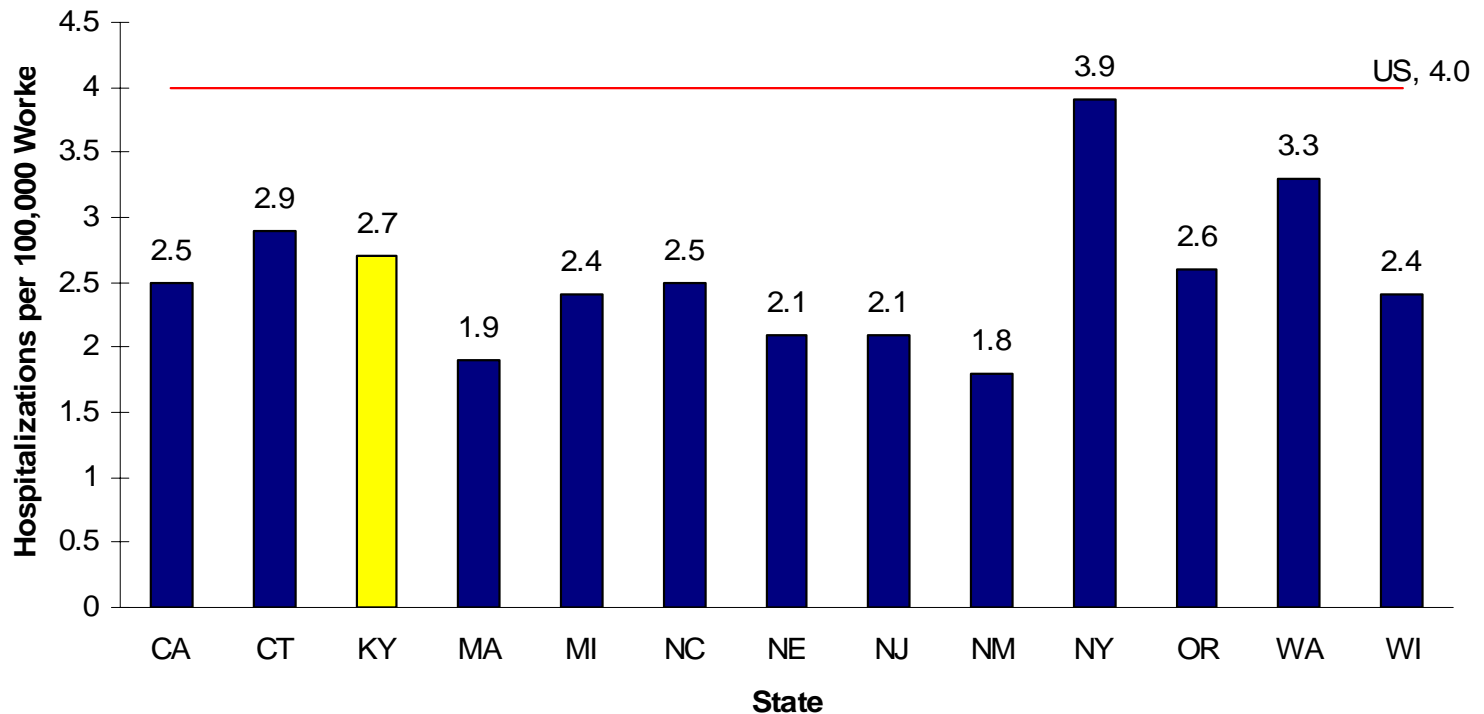


## Indicator #6: Hospitalization for Work-Related Burns

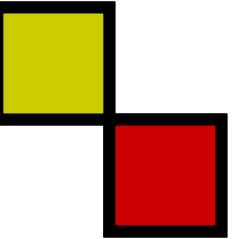
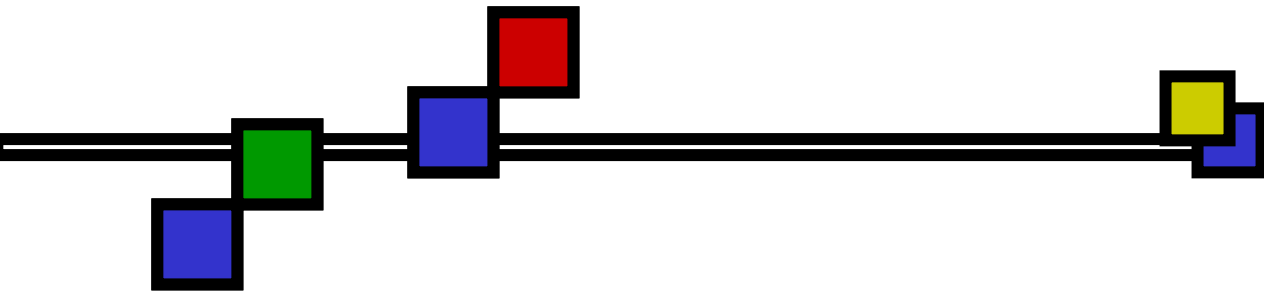
44 cases in 2004

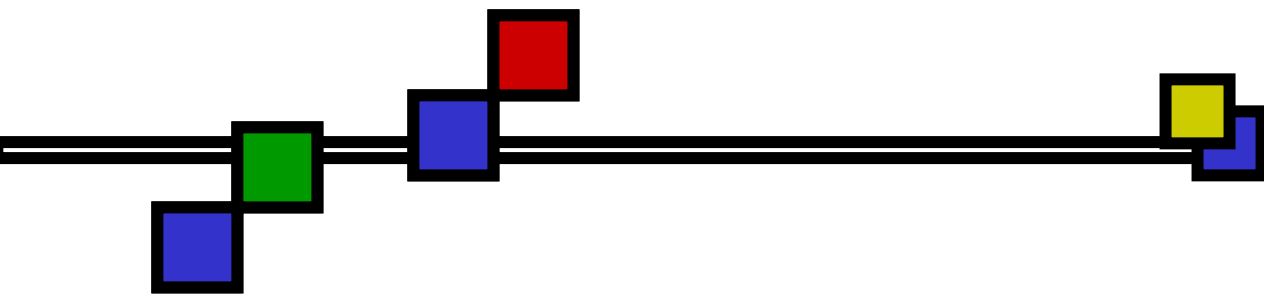


# Rate of Hospitalizations for Work-related Burns by State and U.S., 2000.

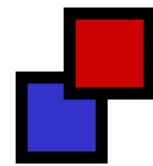
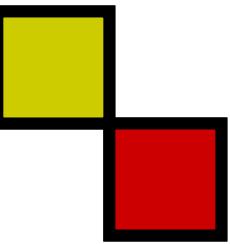


Data Source: Kentucky Department for Public Health UB92 hospital discharge data.





Indicator #7: Work-related  
Musculoskeletal Disorders (MSDs)  
with Days Away From Work  
Reported by Employers

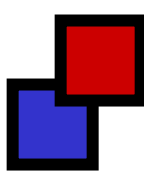


# Numbers and Incidence Rates for MSDs in Kentucky Involving Days Away From Work.

Year	All Musculo-skeletal Disorders		MSDS of the Neck, Shoulder and Upper Extremities		Carpal Tunnel Syndrome Cases		MSDs of the Back	
	<i>Number</i>	<i>Rate<sup>a</sup></i>	<i>Number</i>	<i>Rate</i>	<i>Number</i>	<i>Rate</i>	<i>Number</i>	<i>Rate</i>
<b>2002</b>	10,089	850	2,407	203	275	23	5,481	462
<b>2001</b>	9,912	814	3,011	247	407	33	4,982	409
<b>2000</b>	12,732	1026	3,460	279	331	27	7,053	568



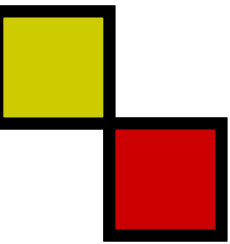
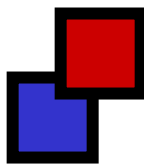
# High-Risk Occupations for MSDs

- Operators, Fabricators, Laborers- Highest number of MSDs (4007 MSDs of neck, shoulder, and upper extremities, 154 carpal tunnel syndrome cases, 2931 MSDs of the back)
  - Service- 1093 MSDs of neck, shoulder, and upper extremities, 1842 MSDs of the back)
- 

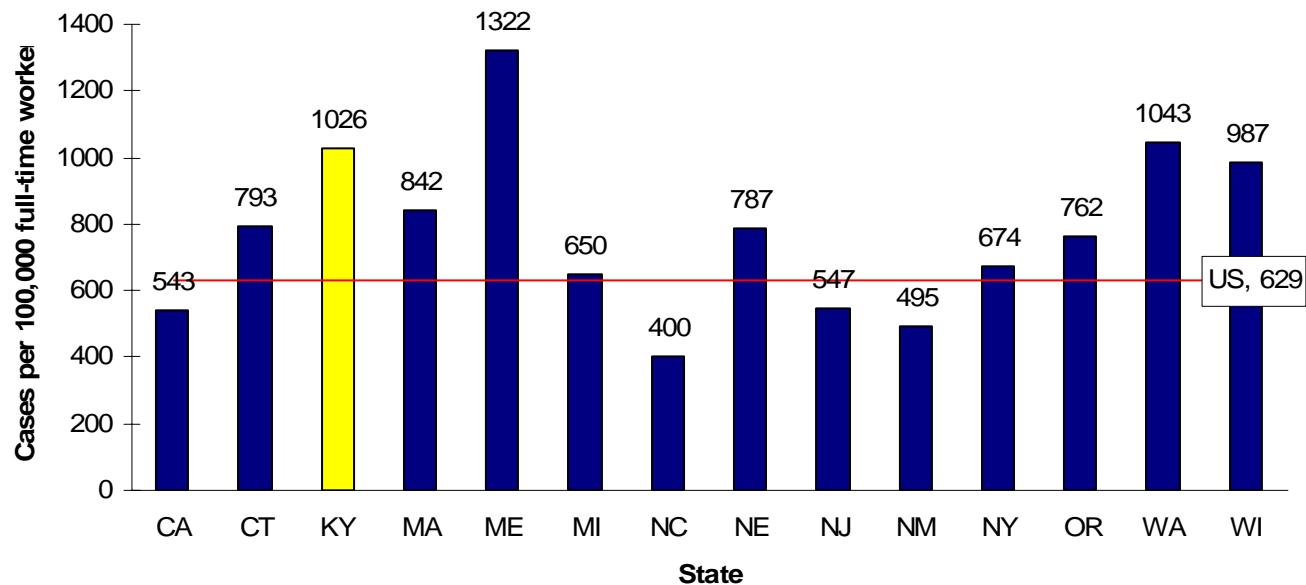
Data Source: Annual Bureau of Labor Statistics (BLS) Survey of Occupational Injuries and Illnesses (SOII).

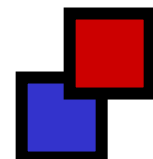
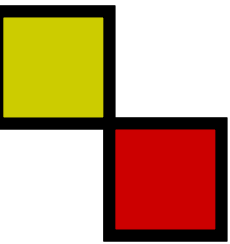
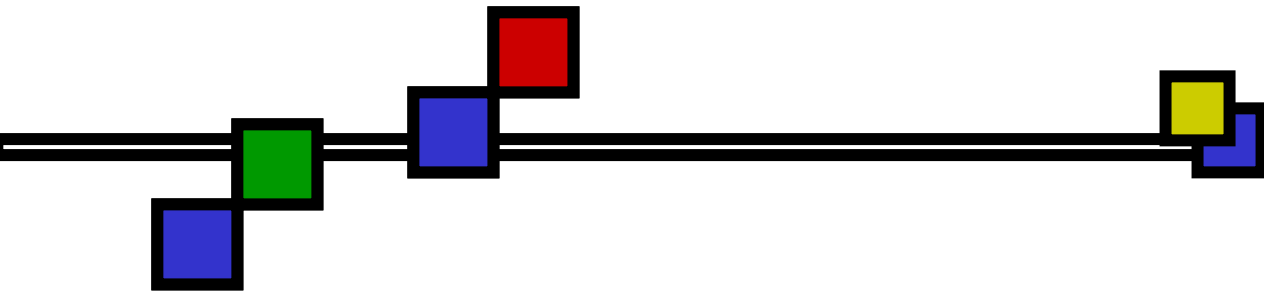


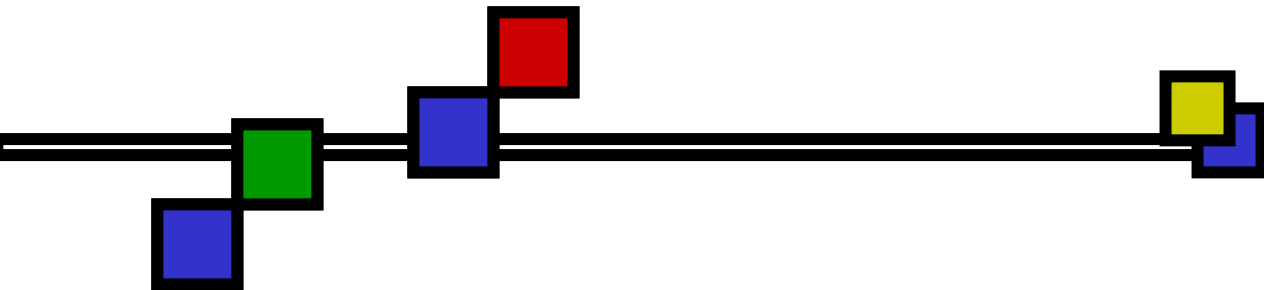
# High-Risk Industries For MSDs

- 
- Manufacturing- (2554 MSDs of the neck, shoulder, and upper extremities, 166 carpal tunnel syndrome cases, 1357 MSDs of the back)
  - Services- (1413 MSDs of the neck, shoulder, and upper extremities, 54 carpal tunnel syndrome cases, 2434 MSDs of the back)
- 

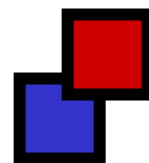
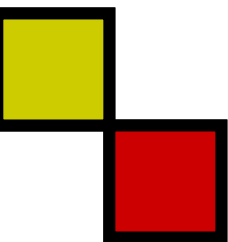
# Rate of All Work-Related Musculoskeletal Disorders Involving Days Away From Work Reported by Private Sector Employers by State and U.S., 2000.



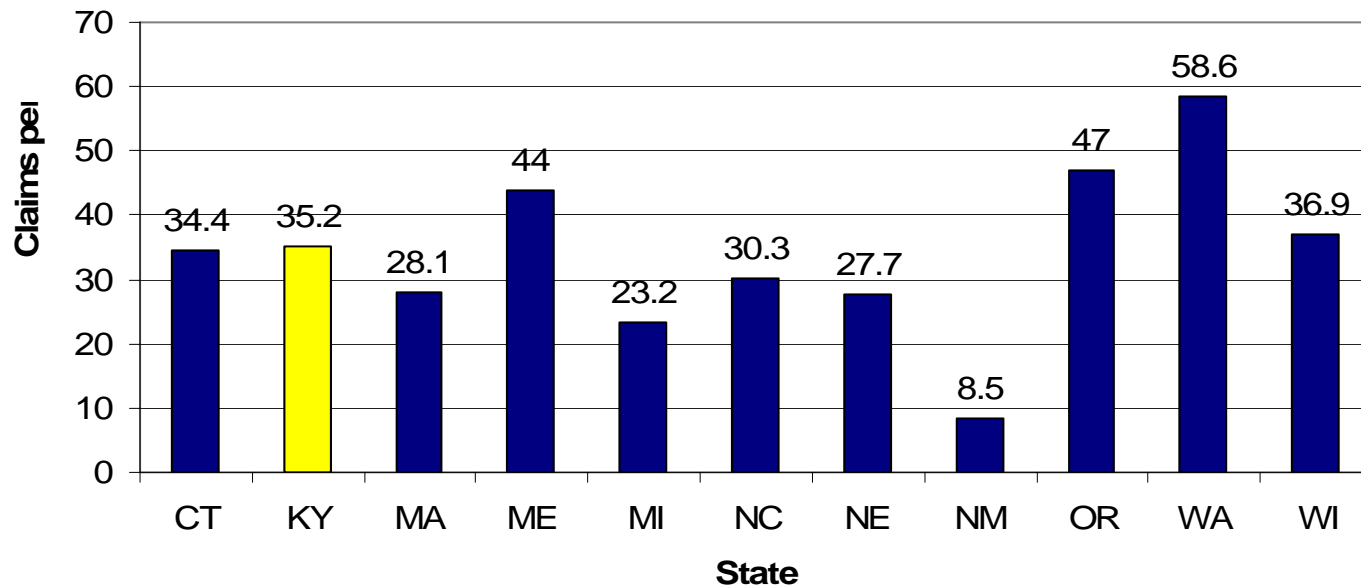




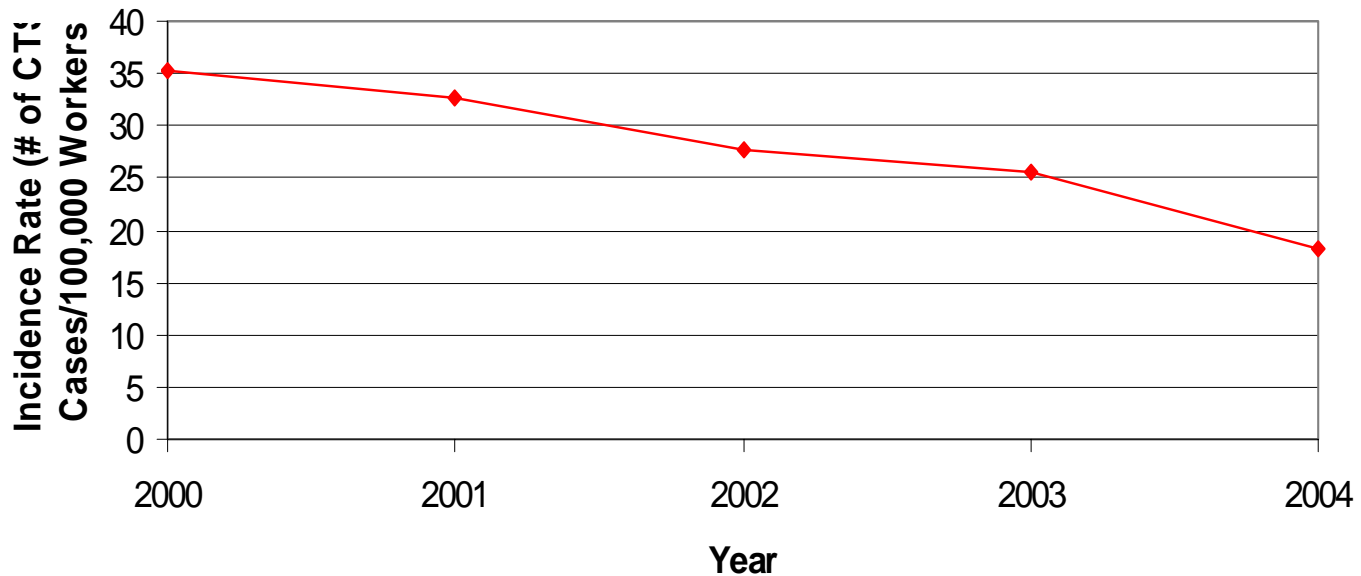
# Indicator #8: Carpal Tunnel Syndrome Cases Filed with the State Workers' Compensation System



# Rate of Lost Work-Time Claims for Carpal Tunnel Syndrome Cases Identified in State Workers' Compensation Systems, 2000.



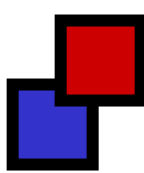
# Kentucky Carpal Tunnel Syndrome Incidence Rates for Years 2000-2004.



Data Source: Carpal tunnel syndrome case data was provided by the Kentucky Office of Workers' Claims, Frankfort, KY.

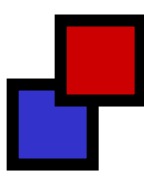


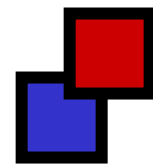
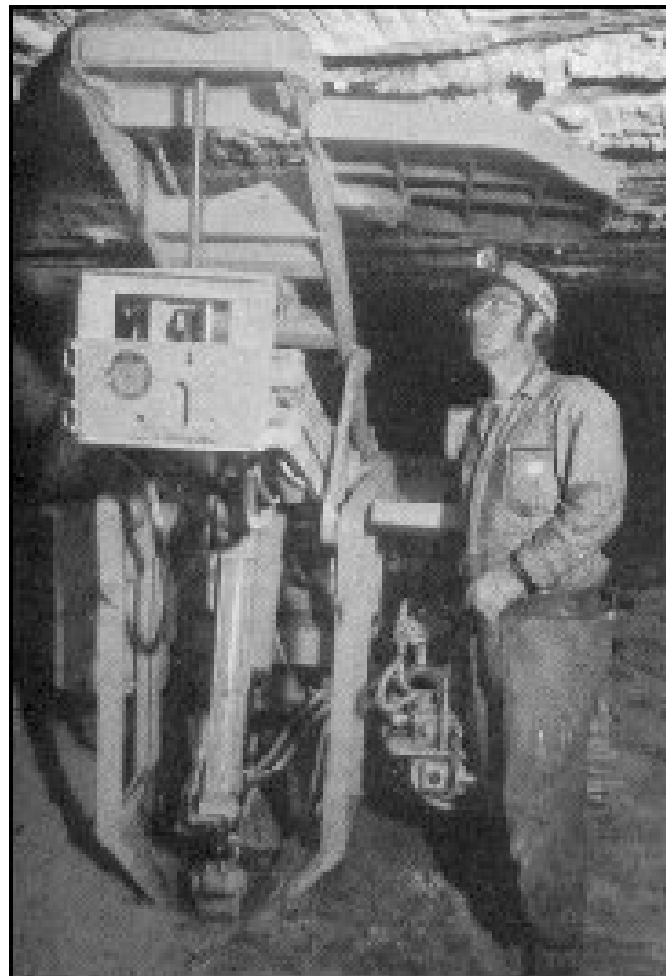
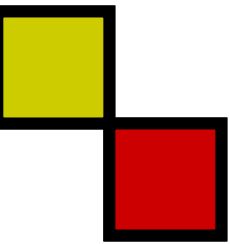
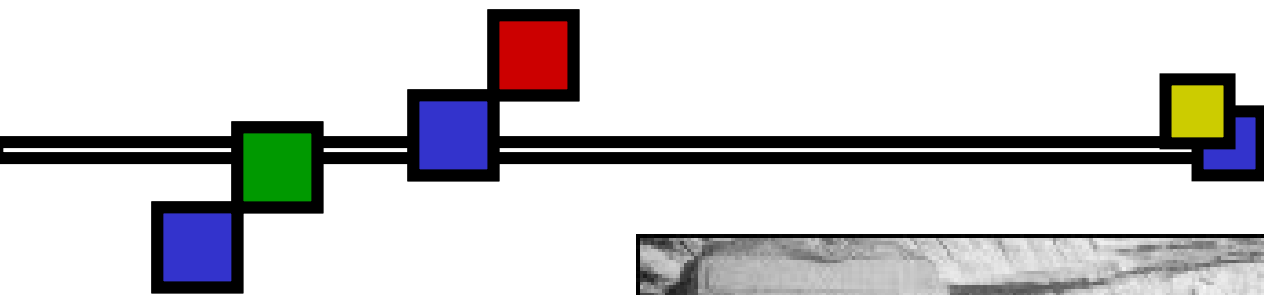
# Industries with Carpal Tunnel Syndrome, 2000-2004.

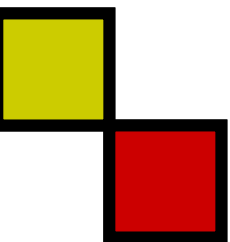
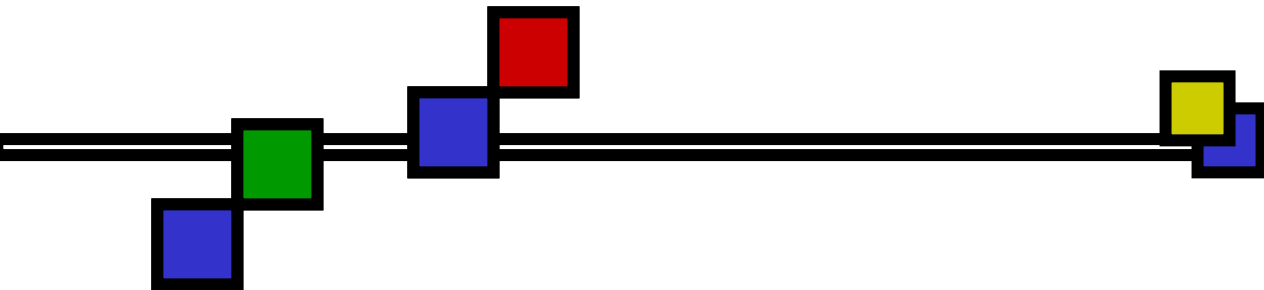
- Elementary and secondary schools (n=89)
  - General medical and surgical hospitals (n=105)
  - Grocery stores (n=77)
  - Motor vehicle parts and accessories (n=119)
  - Motor vehicles and car bodies (n=81)
- 



# Occupations with Carpal Tunnel Syndrome, 200-2004

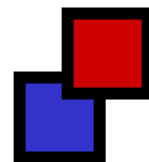
- Machine operators (n=326)
  - Assemblers (n=201)
  - Textile sewing machine operators (n=116)
  - Administrative support (n=83)
  - General office clerks (n=79)
- 



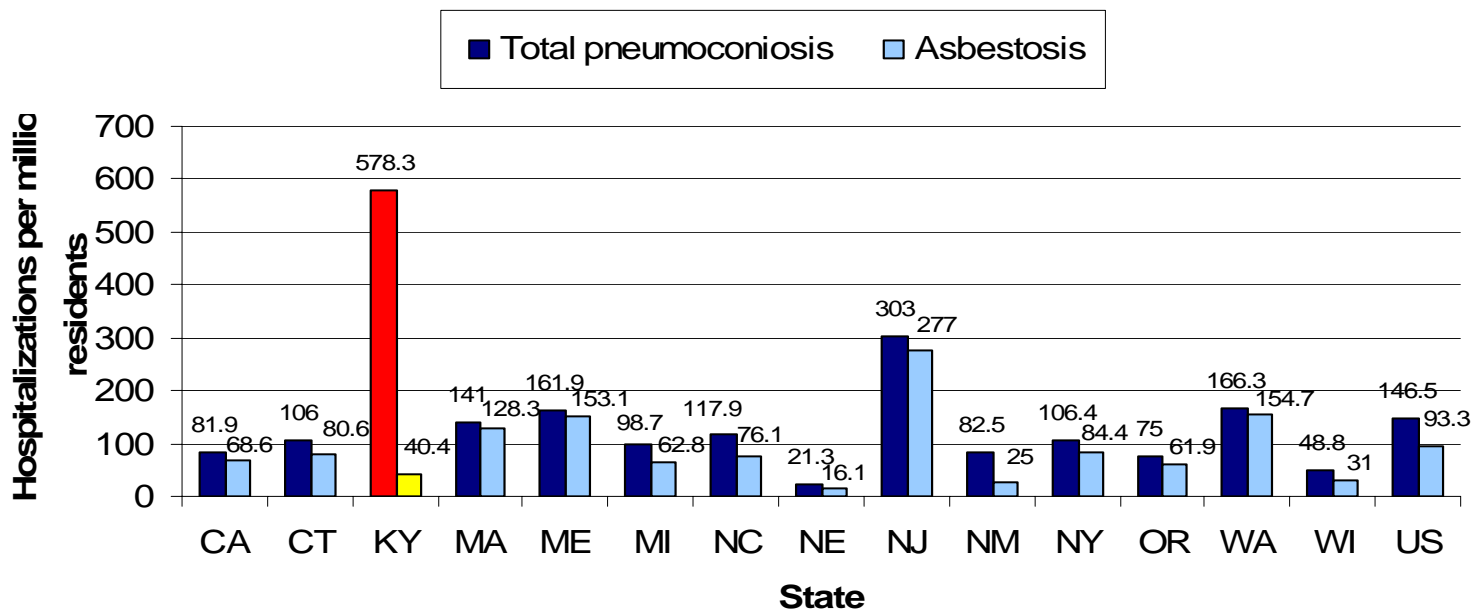


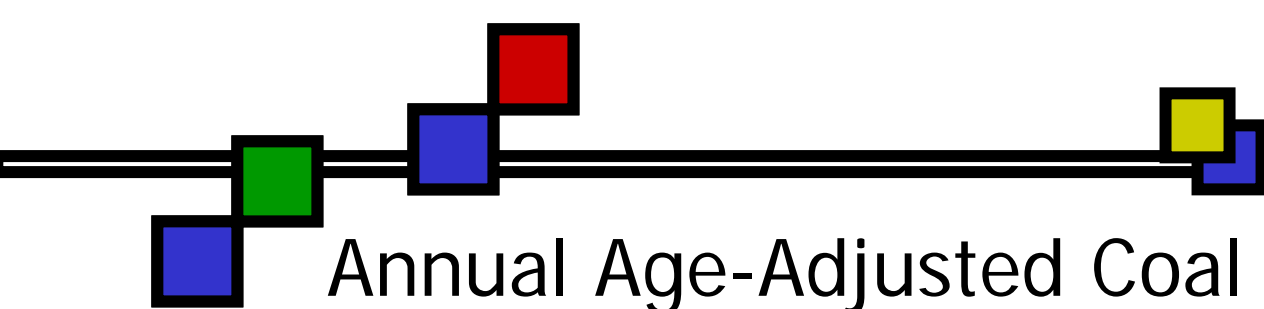
# Indicator #9: Hospitalization From or With Pneumoconiosis

- 1,974 pneumoconiosis hospitalization discharges in 2004

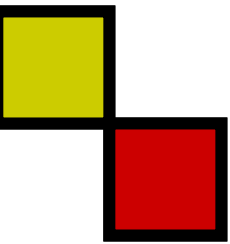


# Age-standardized Rate of Hospitalizations From or With Total Pneumoconiosis and Asbestosis by State and U.S., 2000.

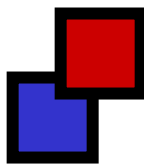




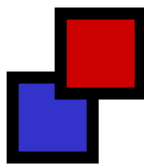
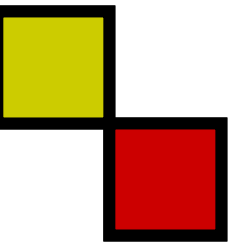
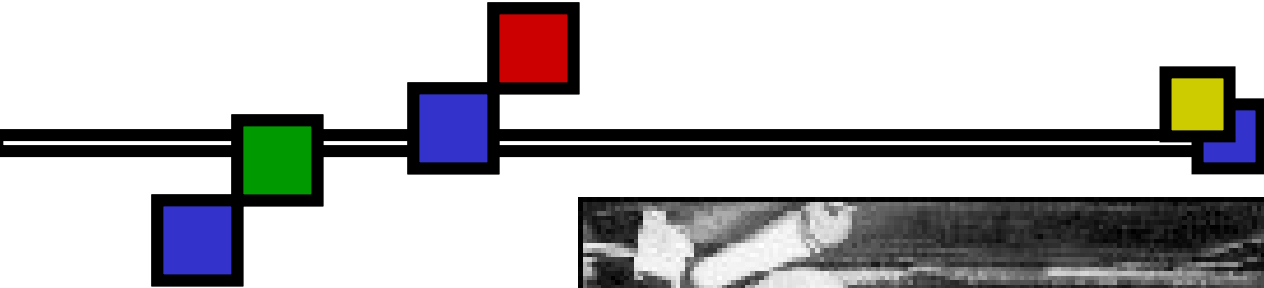
Annual Age-Adjusted Coal Workers  
Pneumoconiosis Hospitalization Rates  
Per Million Residents in Kentucky, (2000-  
2004).

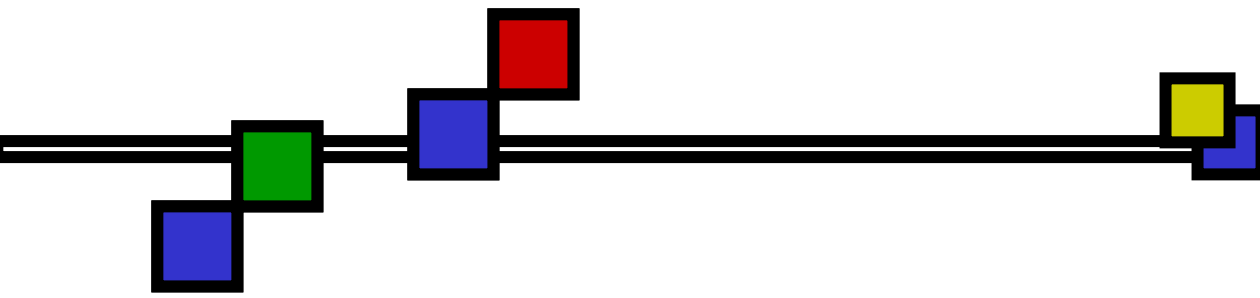


Year	Total # of Hospitalizations	Age-Adjusted Rate
2000	1528	486
2001	1576	499
2002	1740	553
2003	1824	578
2004	1718	545



Data Source: Kentucky Department for Public Health UB92 hospital discharge data.

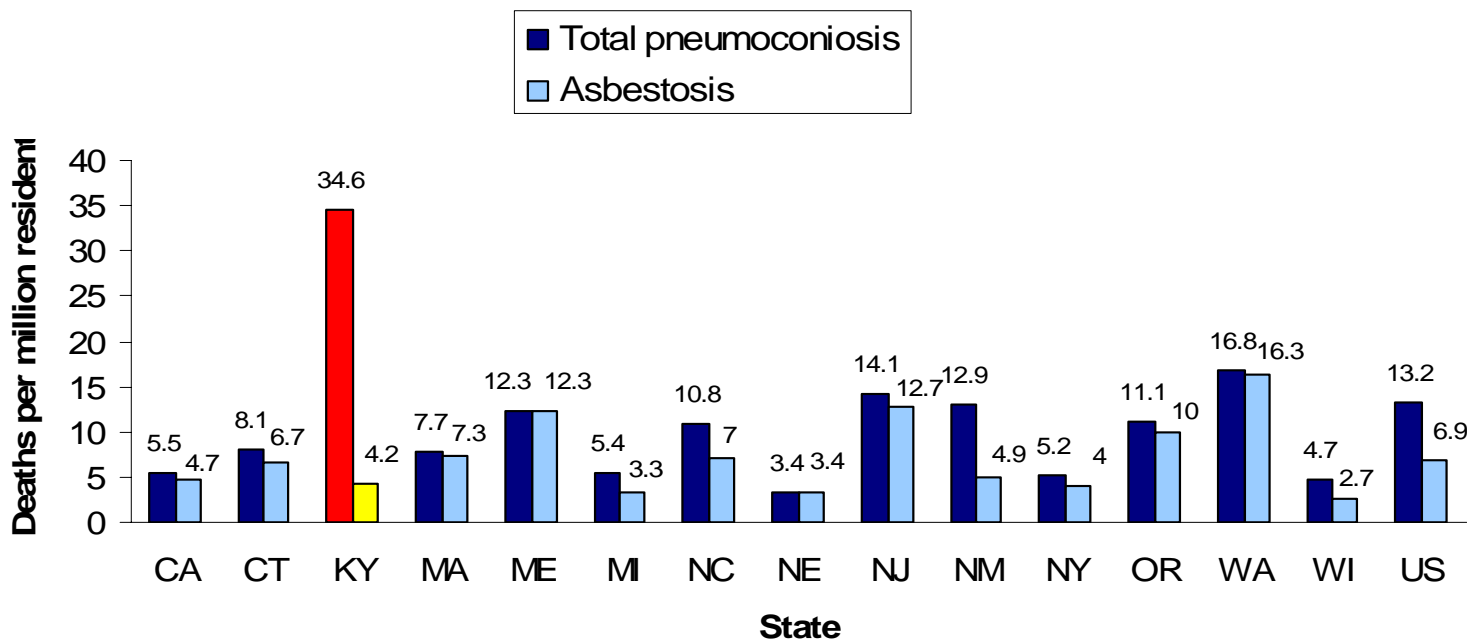


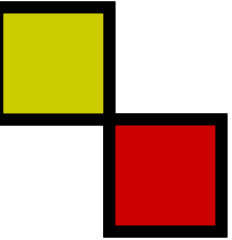
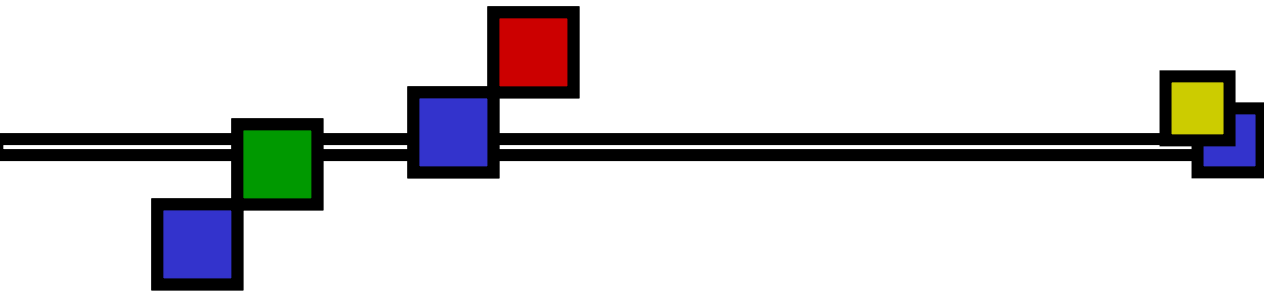


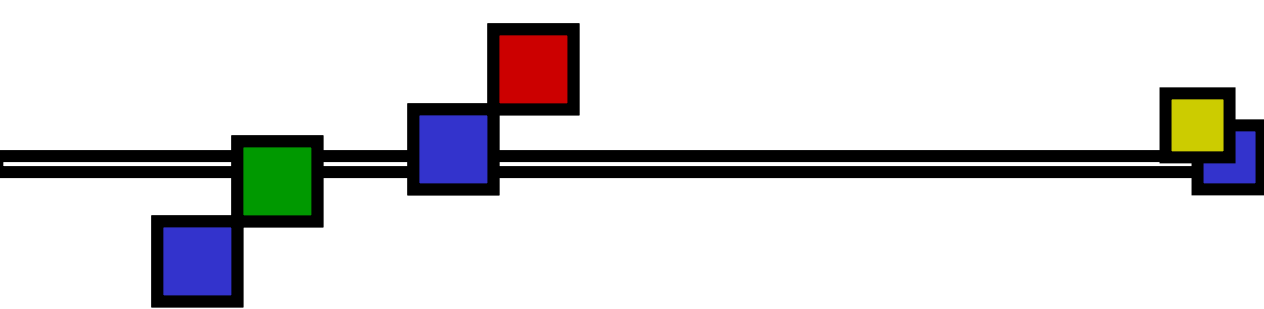
## Indicator #10: Mortality From or With Pneumoconiosis

- 67 cases in 2003, down from 107 in 2000.
- Crude death rate was 20.8 per million residents and age-adjusted death rate was 21.6 in 2003.

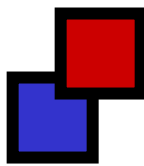
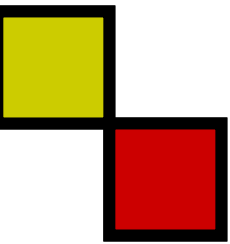
# Age-Standardized Mortality Rate From or With Total Pneumoconiosis and Asbestosis by State and U.S., 2000.





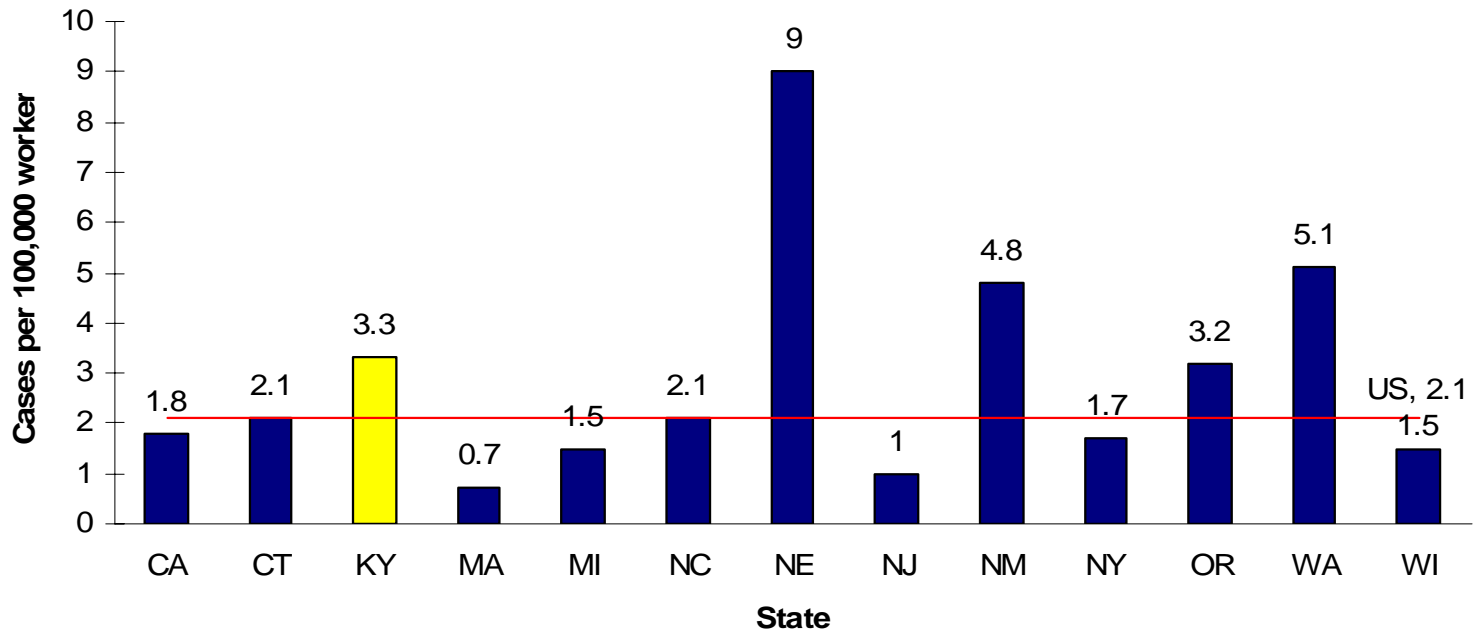


# Indicator #11: Acute Work-Related Pesticide-Associated Illness and Injury Cases Reported to Poison Control Centers



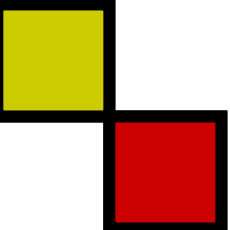
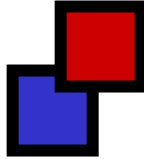
- 59 Pesticide poisoning cases reported in 2004, increased from 47 cases in 2003.
- Annual incidence rate of 3.1/100,000 employed in 2002.

# Rate of Work-Related Pesticide Associated Poisonings by State and U.S., 2000.

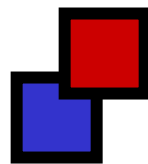
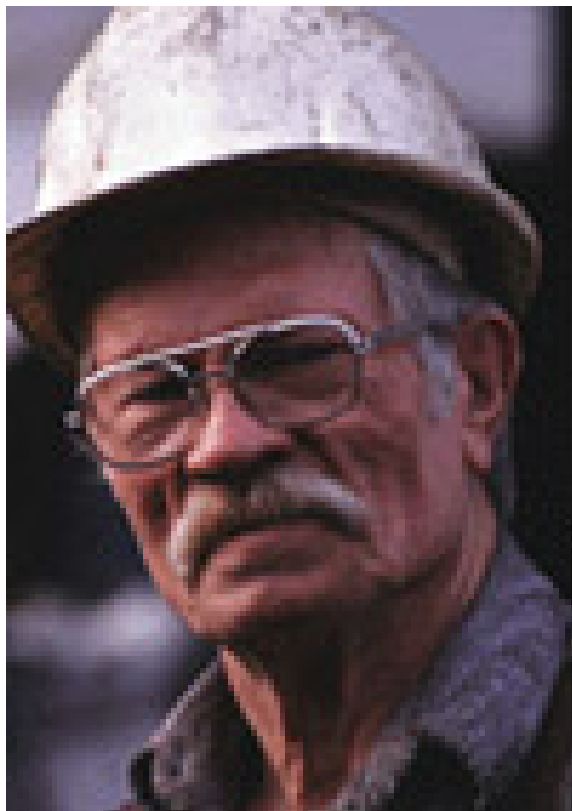
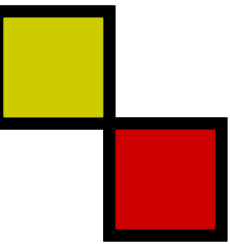
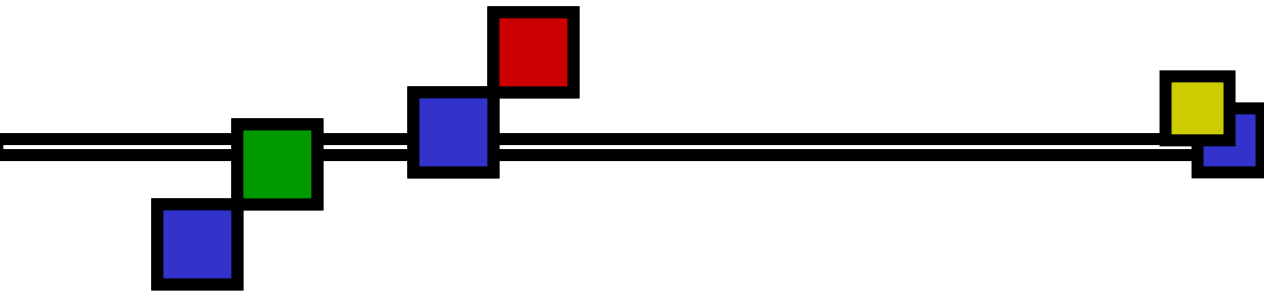


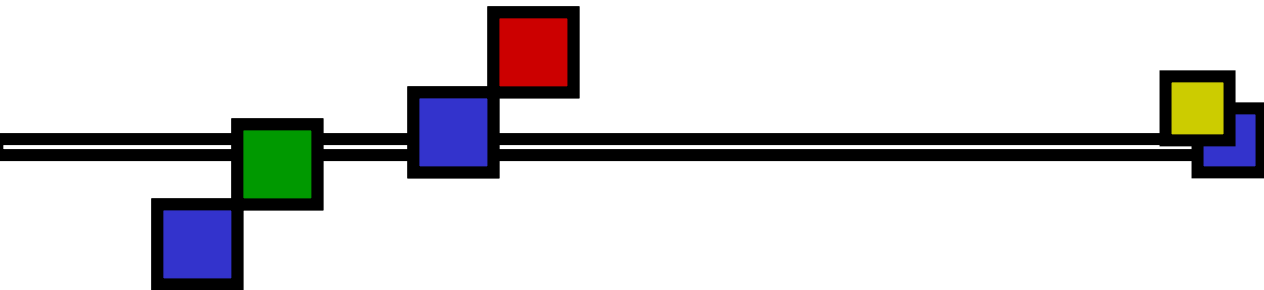


# Primary Pesticide Exposures

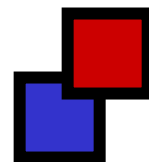
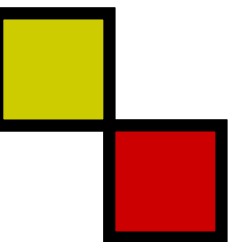
- Disinfectant industrial cleaners (22%)
  - Other/unknown disinfectants (15%)
  - Other herbicides (8%)
- 
- 

Data Source: Work-related pesticide poisoning data was obtained from the Kentucky Regional Poison Control Center, Louisville, KY

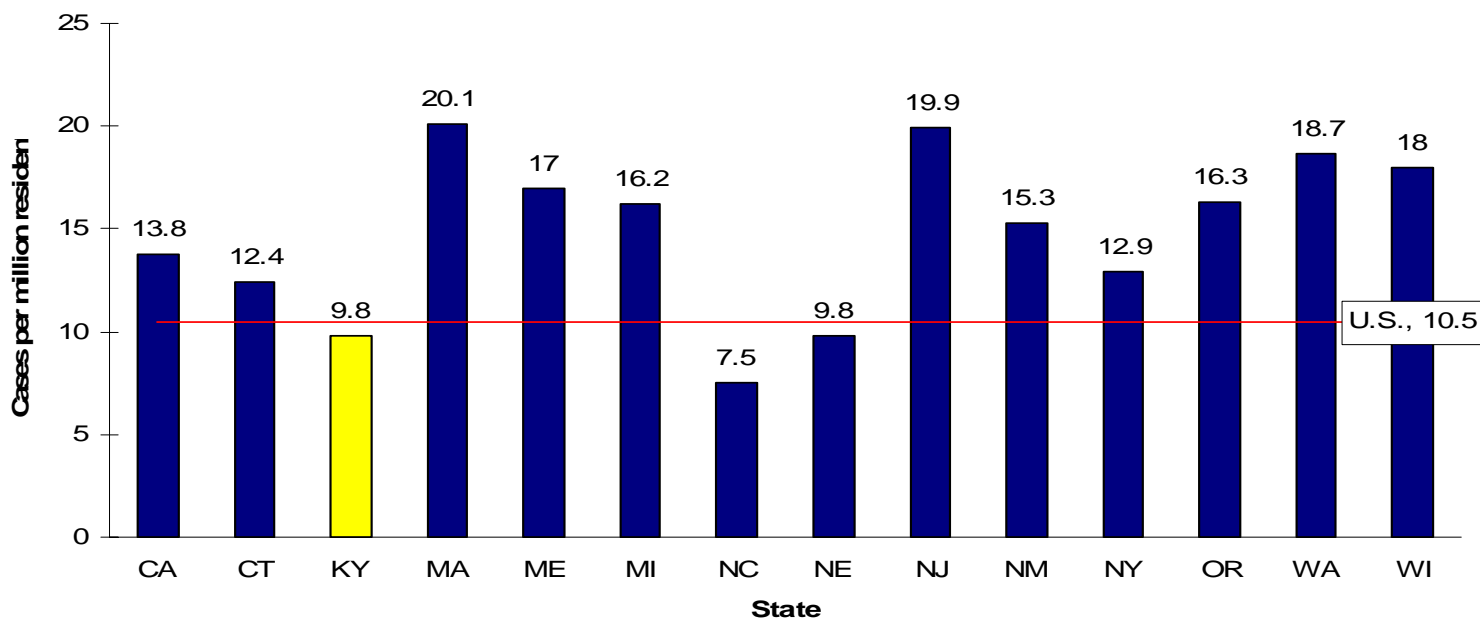




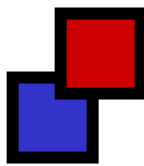
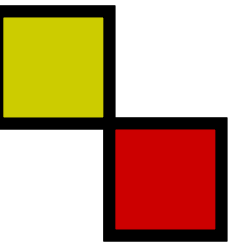
# Indicator #12: Incidence of Malignant Mesothelioma

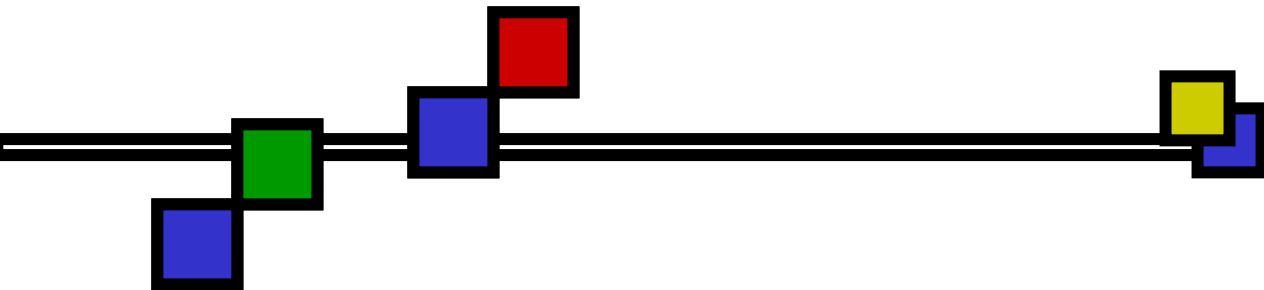


# Age-Standardized Incidence Rate of Malignant Mesothelioma by State and U.S., 2000.



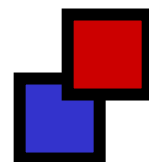
Data Source: Malignant mesothelioma case data was provided by the Kentucky Cancer Registry.



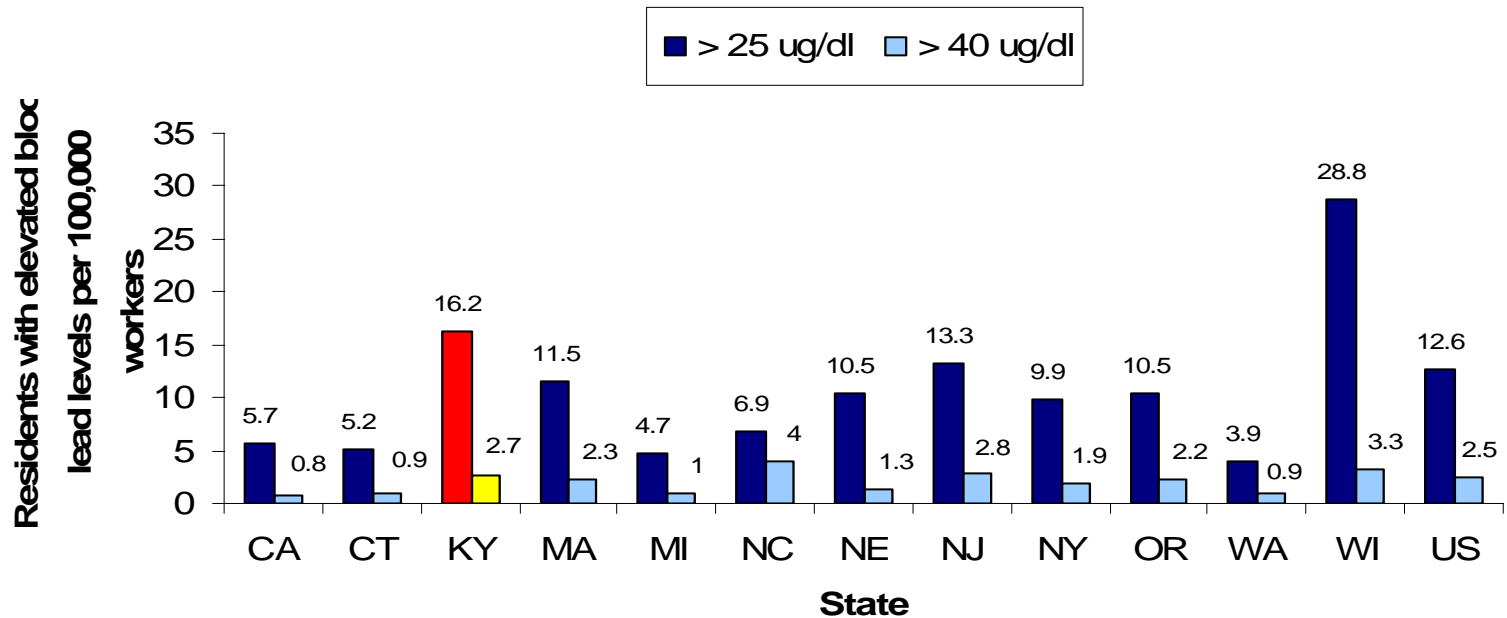


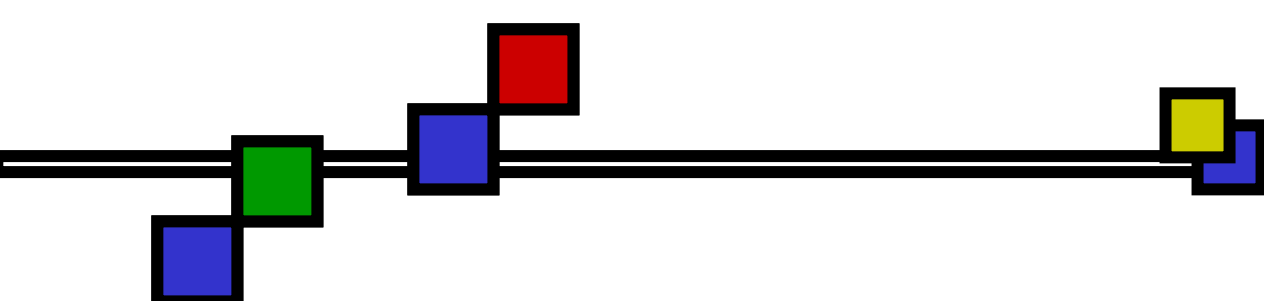
## Indicator #13: Elevated Blood Lead Levels Among Adults

- The Kentucky adult blood lead level ( $>25\mu\text{g}/\text{dL}$ ) prevalence rate was 17.82 cases per 100,000 employed persons, 76% above the average state rate of  $10.1\mu\text{g}/\text{dL}$  in 2001.

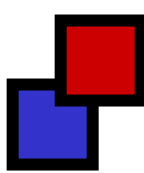


# Prevalence Rate of Persons with Blood Lead Levels $\geq 25\mu\text{g}/\text{dl}$ and $\geq 40\mu\text{g}/\text{dl}$ of Persons Age 16 Years or Older by State and U.S., 2000.





# Industries Where Most Lead Exposures Occurred in 2004

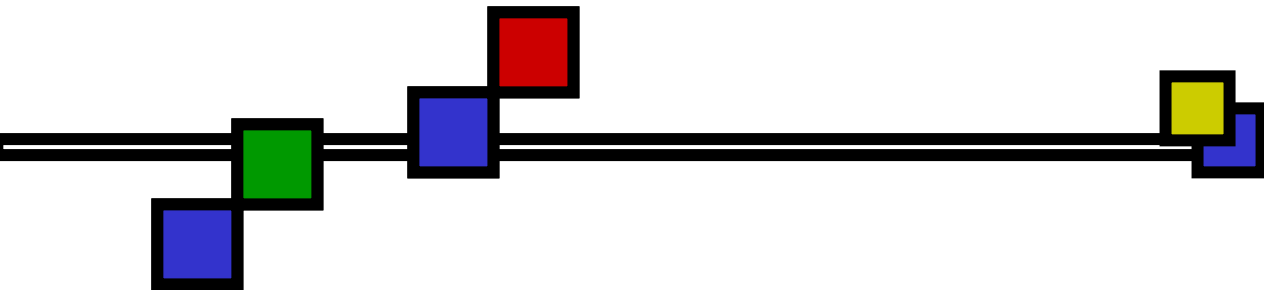
- Battery manufacturing (n=131)
  - Electrical equipment, electric lamp bulb and part manufacturing (n=5)
  - Fabricated metal product manufacturing (n=4)
- 

Data Source: Adult blood lead level data was obtained from the Kentucky Adult Blood Lead Epidemiology and Surveillance (ABLES) program located in the Kentucky Lead Poisoning Prevention Program, Division of Adult and Child Health, Frankfort, KY.



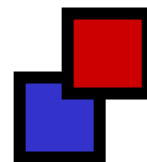
AUTOMOTIVE INDUSTRY:  
CO2 BLAST CLEANING A MAN-FAN

1-800-ALPHEUS  
Copyright 1999 CAE Alpheus Inc.

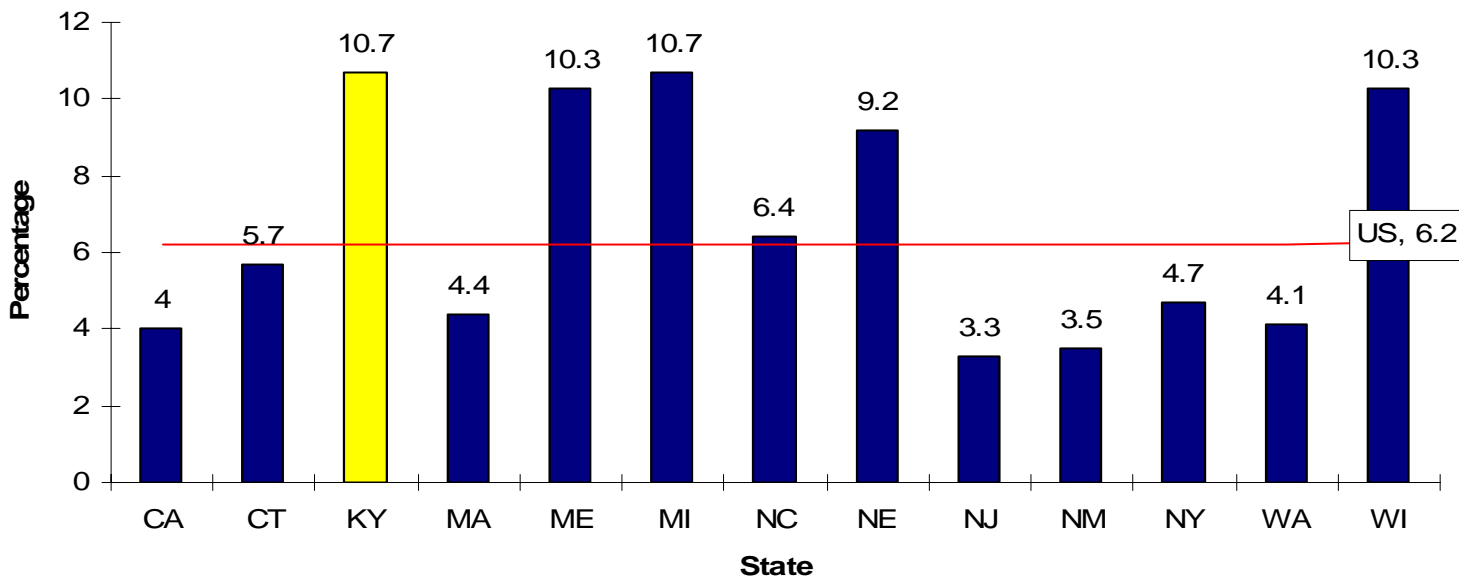


## Indicator #14: Percentage of Workers Employed in Industries at High Risk for Occupational Morbidity

- Kentucky and Michigan employed the largest percentage of workers in high-risk industries

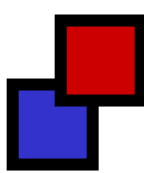


# Percentage of Workers in Industries With High Risk for Occupational Morbidity by State and U.S., 2000.



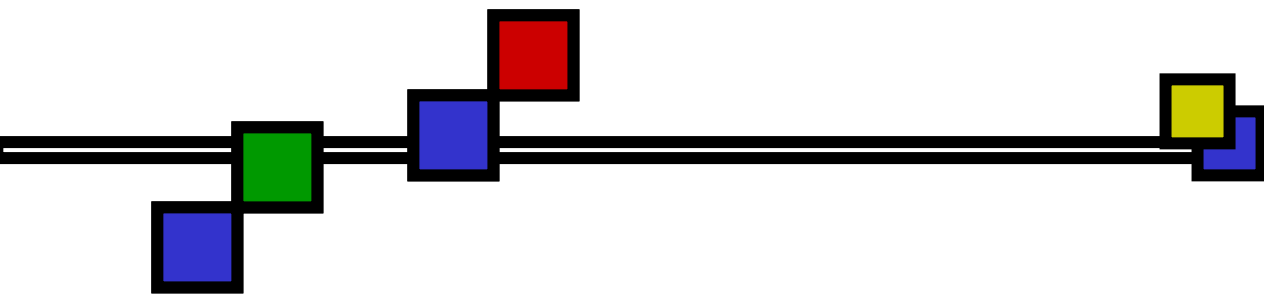


# Kentucky Industries at Great Risk for Occupational Injuries

- Nursing care facilities
  - Scheduled air transportation
  - Motor vehicle manufacturing
- 

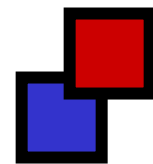
Data Source: Bureau of the Census County Business Patterns (CBP)



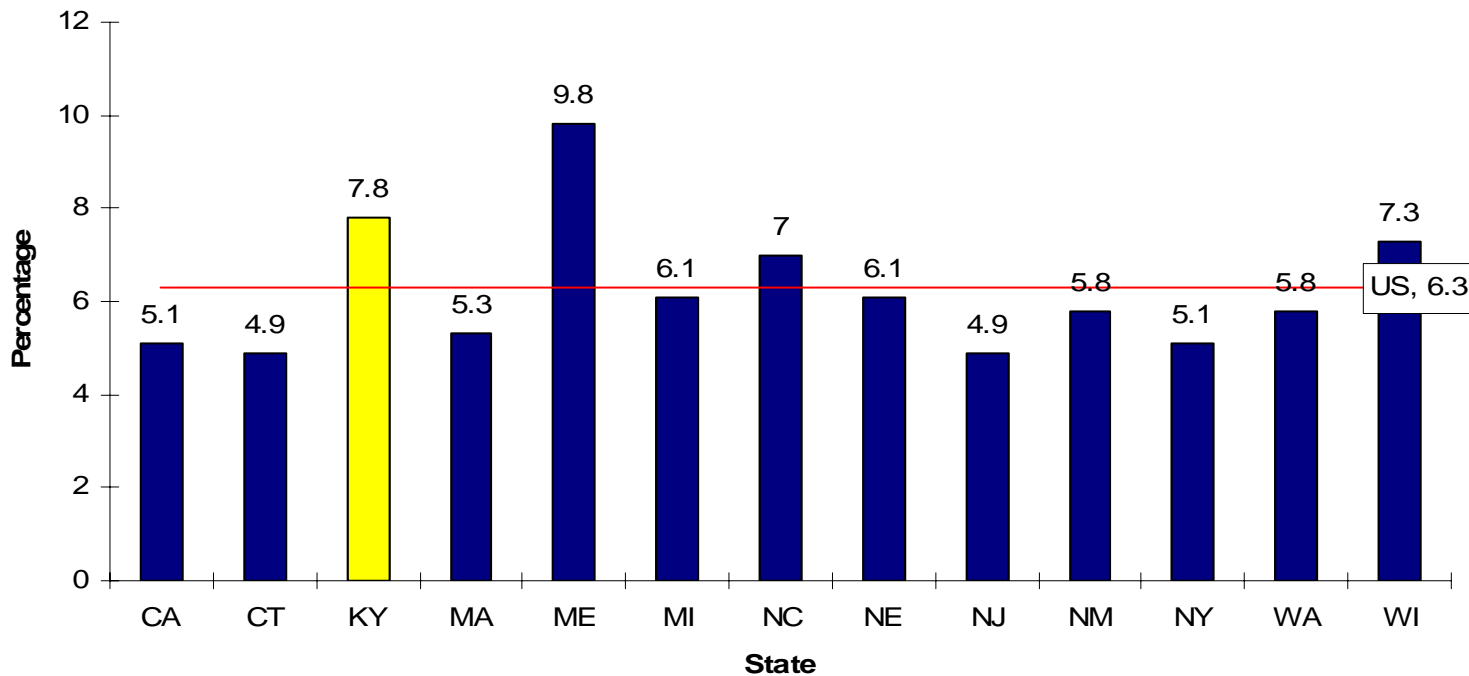


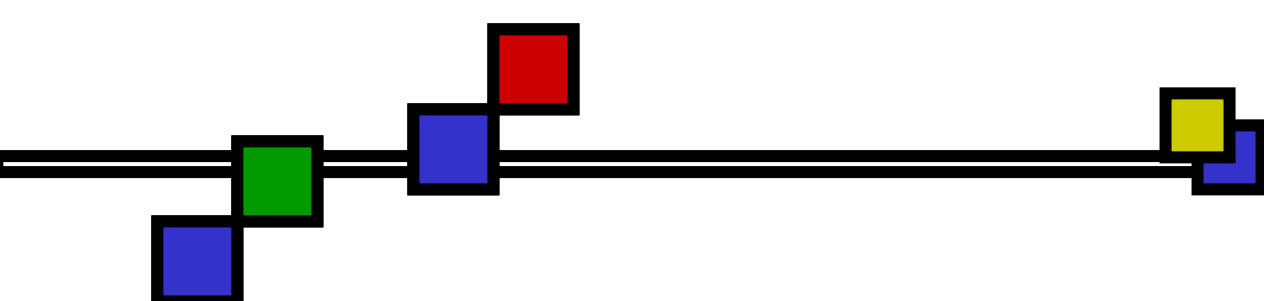
## Indicator #15: Percentage of Workers Employed in Occupations at High Risk for Occupational Morbidity

- Kentucky had 7.8% of its workers employed in occupations at increased risk for an occupational injury, second after Maine.



# Percentage of Workers in Occupations with High Risk for Occupational Morbidity by State and U.S., 2000.

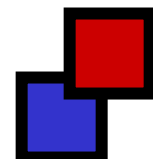
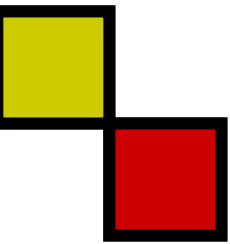
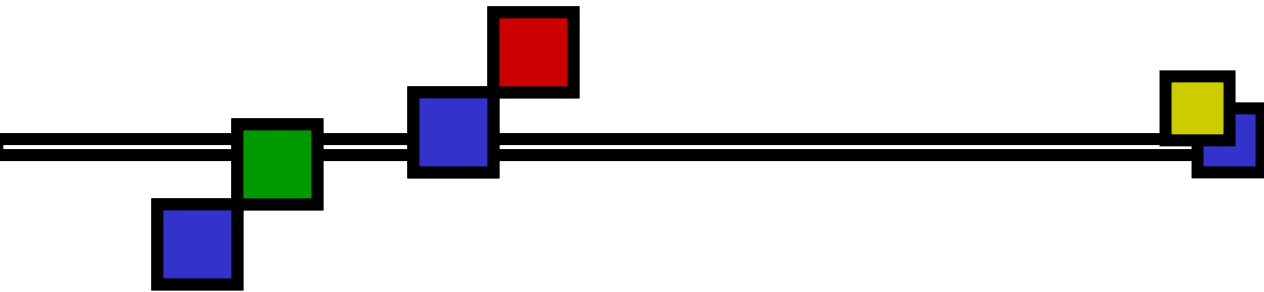


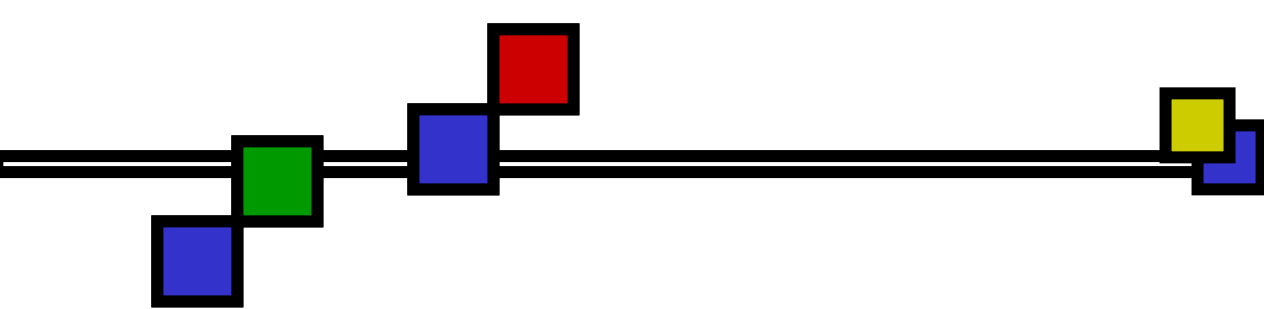


# Occupations at Highest Risk for Occupational Injuries

- Truck drivers
- Laborers

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

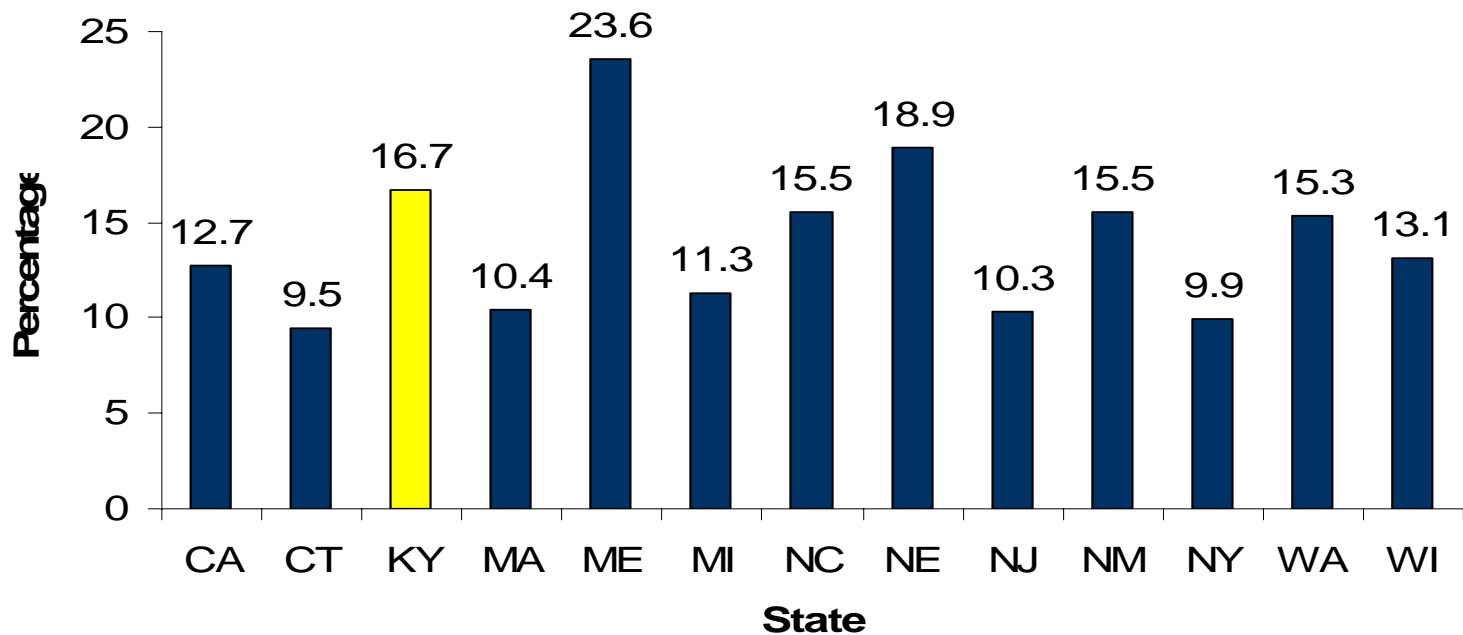




Indicator #16: Percentage of Workers Employed in Industries and Occupations at High Risk for Occupational Mortality.

- 17% of Kentucky's workers were employed in high mortality-risk industries
- 

# Percentage of Workers Employed in Industries with High Risk for Occupational Mortality by State, 2000.



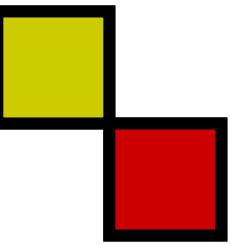
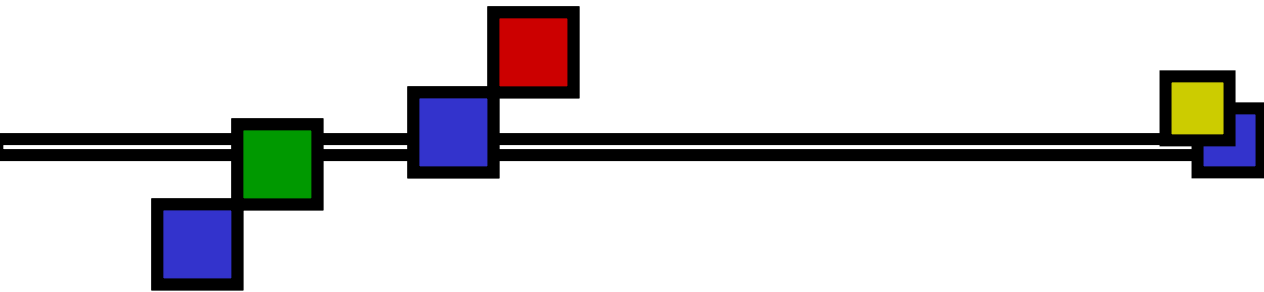


# Occupations With the Highest Risk of Occupational Mortality

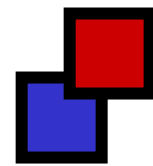
- Truck drivers
  - Farming and farm worker occupations
- 

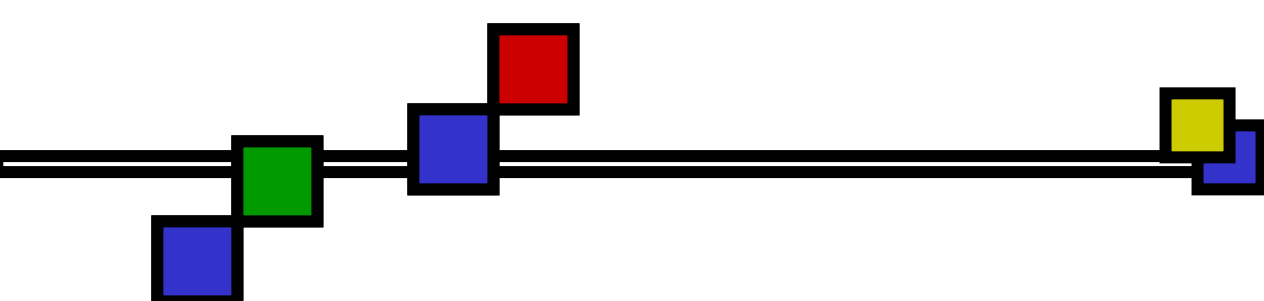
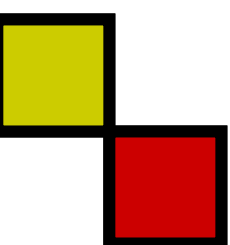
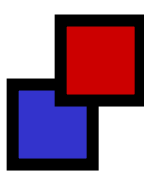
Data Source: Bureau of Labor Statistics (BLS) Current Population Survey (CPS)





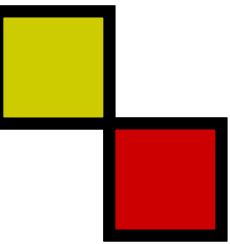
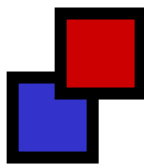
# State-Specific Indicator: Occupational Motor Vehicle Collisions



- 
- 12,573 occupational motor vehicle collisions (MVCs) in 2004
    - 4,567 semi-trucks
    - 3,328 single trucks
    - 1,533 trucks and trailers
  - This number is increased from the 11,459 occupational MVCs in 2003.
- 
- 

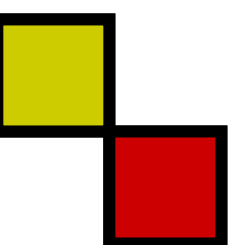


# Work-Related MVCs

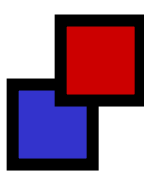
- 
- 3,194 people were injured in occupational MVCs in 2004
  - 135 people (drivers and occupants) were killed in 2004
  - The occupational motor vehicle fatality rate was 0.9/100,000 in 2002.
  - The nonfatal occupational MVC injury rate was 21.5/100,000 in 2002.
- 



# Injury Severity of Occupational Driver MVCs, 2000-2004.



<b>Injury Severity</b>	<b>2004</b>	<b>2003</b>	<b>2002</b>	<b>2001</b>	<b>2000</b>
<b>Fatal</b>	25	23	16	8	20
<b>Incapacitating</b>	106	103	102	121	138
<b>Non-Incapacitating</b>	343	331	335	374	399
<b>Possible Injury</b>	337	317	308	316	381
<b>None Detected</b>	12509	11264	10620	11038	11485



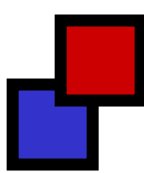
Data Source: Motor vehicle collision surveillance data was obtained from the Collision Report Analysis for Safer Highways (CRASH) database established and maintained by the Kentucky State Police.

# Human Factors Involved in Occupational MVCs

Human Factor:	Non-Occupational Driver					Total	Occupational Driver					Total
	2000	2001	2002	2003	2004		2000	2001	2002	2003	2004	
<b>Distraction/ Inattention</b>	1164	1166	1132	1292	1404	<b>6158</b>	3214	2974	2769	2770	3113	<b>14840</b>
<b>Failed To Yield Right of Way</b>	545	555	578	564	538	<b>2780</b>	635	541	514	500	523	<b>2713</b>
<b>Following Too Close</b>	186	161	138	141	193	<b>819</b>	325	248	246	241	246	<b>1306</b>
<b>Misjudge Clearance</b>	130	142	139	152	161	<b>724</b>	1293	1299	1380	1393	1516	<b>6881</b>
<b>Not Under Proper Control</b>	158	197	226	273	299	<b>1153</b>	245	328	361	398	472	<b>1804</b>

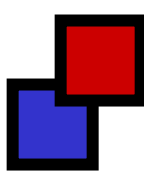


# Summary I

- KY's fatal work-related injury rate is 75% above the national fatality rate.
  - KY's work-related hospitalization rate was 32% higher than the national rate in 2002.
  - When compared to other pilot states, KY had the 2<sup>nd</sup> highest rate of lost work time claims for amputations (WC)
- 

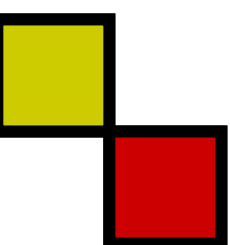
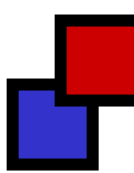


# Summary II

- KY had the 10<sup>th</sup> highest musculoskeletal disease case rate involving days away from work in the nation in 2002.
  - In 2004, there were 12,573 occupational MVCs with 3,194 injured and 135 killed.
  - KY had the 3<sup>rd</sup> highest coal workers' pneumoconiosis mortality rate in the nation in 2002.
- 

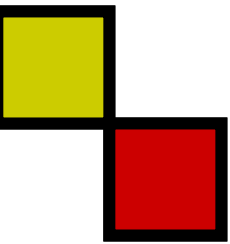
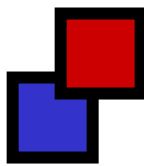


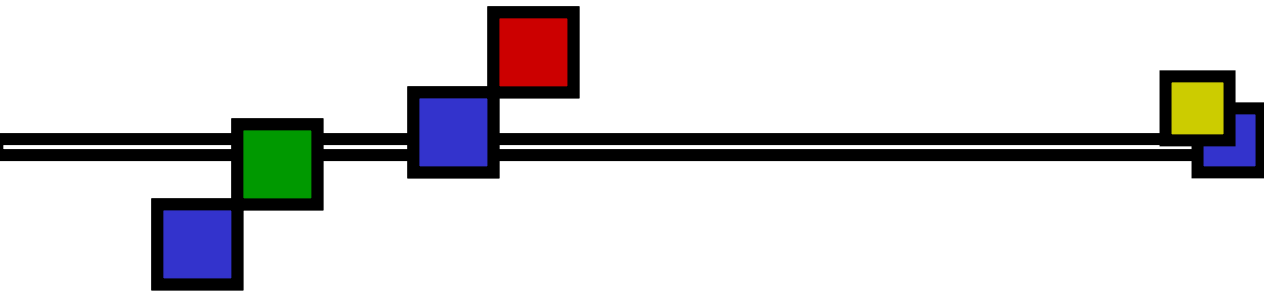
# Summary III

- 
- KY had the 7<sup>th</sup> highest incidence rate for occupational poisonings in 2002.
  - The KY adult blood lead level prevalence rate was 76% above the average state rate in 2002.
  - When compared to the pilot states, KY had the highest and 3<sup>rd</sup> highest percentages of workers in high-risk industries for nonfatal and fatal occupational injuries.
- 

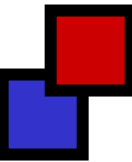
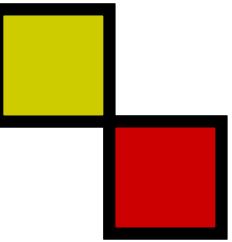


# Where do we go from here?

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- Establishment of consortium to develop state-wide priorities for the prevention of occupational injuries and illnesses.
- 



# Occupational Motor Vehicle Fatality Investigation

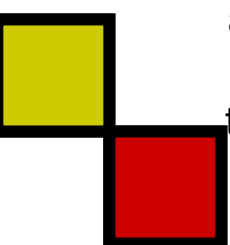


# Passenger Dies When Semi-Truck Trailer Hits Cow In Roadway



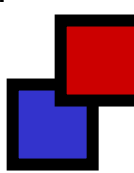


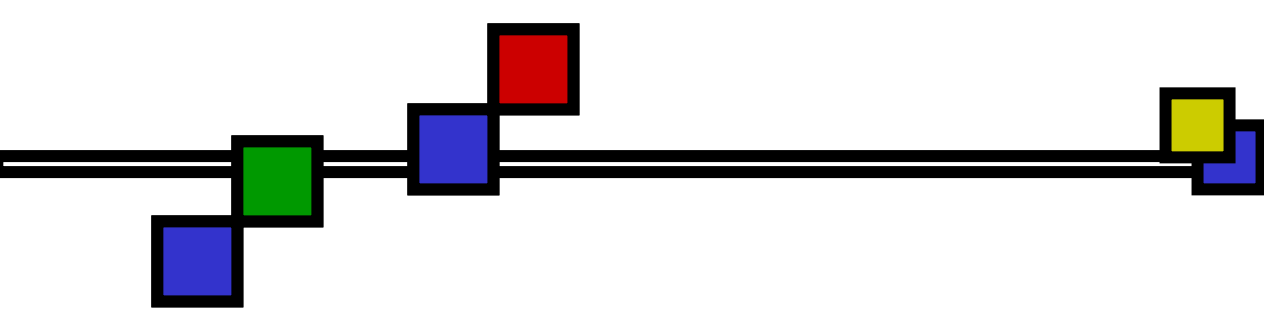
## Summary



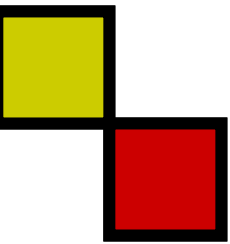
On November 8, 2005, a 26-year-old male laborer who was a passenger in a semi-truck died when the driver swerved to avoid hitting a cow that was standing in the parkway lane. The two employees had been traveling westbound for approximately one hour when the driver noticed a cow in his lane. He swerved to avoid hitting the cow but hit it anyway. The tractor and two trailers jack-knifed, traveled through the median with the cab and trailers flipped onto their right sides, slid across the eastbound lanes, then the cab slammed through the guardrail.

The cab came to rest on the steep embankment of the shoulder. A passing motorist called emergency services. Emergency personnel arrived, climbed down the steep embankment and found the top of the cab crushed. Both driver and passenger were thought to be alive. However, because of the steep slope and the condition of the cab, rescue personnel could not administer first aid to the two men in the cab. Tow trucks were called to the scene to move the two trailers and pull the cab up the slope and onto the pavement. Using torches, rescuers cut away the metal of the cab to reach the two men. Both men were wearing seatbelts which needed to be cut in order to free them. Emergency personnel assessed both men. The driver was found to be alive and was transported to the nearest hospital. However, the passenger did not have vital signs. The local coroner was contacted; he arrived and declared the passenger dead at the scene.

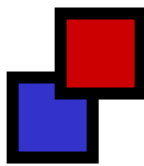




**Recommendation No. 1: Livestock owners should ensure boundary fences are appropriate for the animal type and regularly maintained to ensure both animal and public safety.**

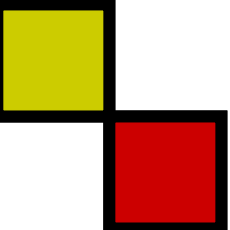
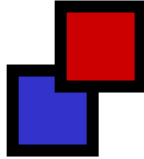


The cow did not have identifying marks and the police were unable to trace the cow's owner. However, it is believed that the cow escaped through a hole in the fence of a nearby farm and onto the parkway. Adequate fencing such as woven wire, no-climb or electric should be used to contain livestock on farms. Fencing should be routinely checked and maintained to ensure breaks, holes, or gaps are repaired in a timely manner.



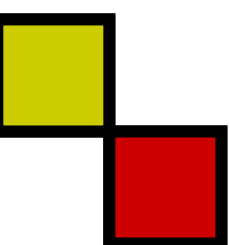
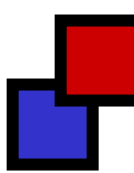


**Recommendation No. 2: Police should warn motorists when errant farm animals are on interstate highways.**

- 
- Police departments should use citizen band radios and temporary roadside signs to warn motorists of errant farm animals loose on the highway. Alerts should be implemented immediately upon notification of a potentially dangerous situation in the area. The alerts should be kept in place until the animal(s) have been removed from the roadways and removal has been verified.
- 

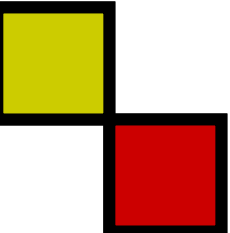


**Recommendation No. 3: Companies should provide professional training for company truck drivers.**

- 
- Company truck drivers should receive formal professional driver training. This training should include defensive driving techniques, driving in adverse weather and road conditions, as well as dealing with the general motoring public. According to two truck driver training schools, defensive driving techniques would include looking eight to ten seconds ahead of the truck and how to deal with animals such as cows in the roadway. Companies should also require truck drivers to receive driver training during night time hours.
- 



**Recommendation No. 4: Parkway medians should be designed and constructed with median barriers to deter crossover median crashes.**

- 
- Parkway medians are designed and constructed to drain water away from road surfaces, give errant drivers space to regain control of their vehicles, provide space for emergencies, and help prevent crossover median crashes. Crossover median crashes result in higher fatality rates than non-crossover crashes (Federal Highway Administration). To help prevent crossover median crashes, installation of barriers in medians less than 60 feet wide should be considered. The median in this incident was 30 to 40 feet wide. Use of continuous, cast-in-place concrete median barriers that are at least 42 inches tall should be considered in parkway medians that are less than 60 feet in width. Also, according to the Federal Highway Administration, this type of barrier is able to contain large trucks and help prevent median crossover crashes of large, heavy semi-tractor trailers.
- 