

# Kentucky Fatal Occupational Injuries 1994-2003



**KENTUCKY FATALITY ASSESSMENT & CONTROL  
EVALUATION (FACE) PROGRAM**

**KENTUCKY INJURY PREVENTION AND RESEARCH CENTER**

## Cooperative Agreement Number U60/CCU409879-10

The Kentucky Fatality Assessment and Control Evaluation (KY FACE) Program is an occupational fatality surveillance project of the Kentucky Injury Prevention and Research Center (KIPRC)\*. The goal of KY FACE is to prevent fatal work injuries by studying the worker, the work environment including the task being performed, the tools used, the energy exchange resulting in fatal injury, and the role of management in controlling the interaction of these factors. KY FACE investigators evaluate information from multiple sources including interviews of employers, coworkers, witnesses and other investigators; examination of the fatality site and equipment; and review of records such as Occupational Safety and Health Administration (OSHA), police, and medical examiner reports; employer safety procedures; and training plans. The FACE program does not seek to determine fault or place blame on companies or individual workers. Findings are summarized in narrative reports that include recommendations for preventing similar events in the future.

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## EXECUTIVE SUMMARY

From 1994-2003, **1319** occupational fatalities were recorded by KY FACE, with **131** worker deaths during 2003. Ninety-six on-site investigative case reports were completed from 1994-2003 and disseminated to employers and others in a position to effect change in work practices.

Following are significant findings of this report:

- 1. Future lost earnings could total as much as \$65.2 million dollars in industries where fatal work injuries occurred.**
- 2. A total of 2248 Years of Potential Life (YPLL) were lost due to fatal worker injuries in 2003.**
- 3. The majority of total Kentucky fatal work injuries occur in the agriculture/forestry/fishing industry.**
- 4. Most Kentucky workers were employed as operators/fabricators/laborers at the time of death.**
- 5. The primary external cause of death in Kentucky workers is motor vehicle collisions.**
- 6. 54% of self-employed worker deaths from 1994-2003 were in the agriculture, forestry, fishing industry. The major external causes of death were due to Ag machinery (28%), motor vehicle collisions (18%), being struck by (12%), and homicide (11%).**
- 7. There were 187 tractor-related deaths in Kentucky from 1994-2003 and 56% of those could have been prevented by the use of a Rollover Protective Structure (ROPS) and safety belts.**
- 8. Thirty-four percent of all Kentucky logging fatalities involved loggers who were self-employed at the time of their death.**

## 2003 INVESTIGATION PROGRAM

The KY FACE Project initiated 28 on-site investigations of selected occupational fatalities during 2003 and 9 evaluation reports were written and disseminated to the work community. Five were machinery-related incidents, and 4 were immigrant worker deaths. Following are case summaries for each of these incidents:

Case 1: Two 20 year-old laborers died after falling approximately 25 feet from suspension scaffolding while preparing the inside of a municipal water tank for painting. Neither laborer was wearing fall personal protection equipment at the time of the fatal incident. The laborers were preparing the inside of a 200,000-gallon water tank for painting when one end of the scaffolding dropped after a support cable slipped. The job foreman arrived at the job site and entered the tank to check on the laborers. He found both laborers on the tank floor. Laborer 1 had respiratory vital signs but Laborer 2 did not. The foreman left the tank, called 911 then reentered the tank. Emergency medical services arrived at the scene and administered cardio-pulmonary resuscitation to the laborers. Laborer 2 was declared dead at the scene. Laborer 1 died the next day in the hospital.

Case 2: On December 3, 2002, a 30-year old Hispanic laborer died when an unsupported 8-foot wall of a trench collapsed on him. Three laborers were working in an unsupported trench when one side caved in, burying one laborer (decedent) and partially burying another Hispanic worker. The third laborer managed to escape the trench unharmed. Two of the laborers were Hispanic, the third was a brother of the owner of the company digging the trench. The coroner pronounced the 30-year old laborer dead at the scene due to asphyxiation.

Case 3: On May 31, 2002, a 25 year-old Hispanic worker died when the gasoline-powered tractor he was operating overturned. The incident occurred when the decedent mowed a steep embankment along a rural roadside and the tractor flipped over a 3-strand, barbed wire fence, pinning the operator under the seat and tire. A passing motorist noticed the overturned tractor and notified 911, emergency services. Local police and fire departments arrived at the scene, as did a local ambulance. The coroner arrived and declared the tractor operator dead due to asphyxiation and crushing injuries to the chest.

Case 4: On November 22, 2002, a 21-year-old male laborer died after being hit in the head with the bucket of a track hoe. He was wearing a safety helmet at the time of the incident. There were six or seven workers at the job site when the incident occurred. The work crew was pouring the footing for a retaining wall as part of a bridge for a private runway that was being built. The concrete form collapsed, trapping one worker and almost trapping two others. The decedent had left to retrieve a shovel to help free the trapped co-worker. As he retrieved the shovel, he walked into a blind spot of the track hoe operator at the same time another worker asked the track hoe operator if there was a chain in the cab of the track hoe. The operator looked down at the floor and as he did so, his hand slightly moved the hand control causing the bucket to move, thus striking the decedent. He was transported to a hospital where he was declared dead by the coroner from blunt force injuries to the head.

Case 5: On October 23, 2002, a 41 year-old male died after he was hit in the head with the handle of an auger. He was part of a four-member work crew tying water lines of private

residences into a municipal water line. He was injured while backing the auger out of the hole. The handle became tangled with the rotating auger bit which caused the handle to flip up and strike him in the head, twice. After being struck, with co-workers following him trying to convince him to sit down, he walked away from the site until emergency rescue workers arrived and convinced him to sit down on a stretcher. He was transported to a local hospital then air lifted to a larger facility where he died five days later from a closed head injury.

Case 6: On August 12, 2002, at 6:40 pm, a Chinese immigrant restaurant owner died after being electrocuted by 110 volts of electricity. The decedent and his wife were refurbishing a restaurant they had recently purchased. They spent the day cleaning the kitchen area while waiting for a washing machine repairman to arrive. Earlier in the day, the decedent had removed the electric cord to a single door, glass-fronted vertical cooler on rollers. He replaced the electrical cord from the unit with an electrical cord he had fabricated himself by attaching one end of a 10 foot length of 10/2 wire to the cooler and the other end to one-foot length of extension cord which plugged into the wall receptacle. The unit was moved around the kitchen all day while the kitchen was cleaned. The ground wire on the 10/2 length of wire came loose and came in contact with the metal frame of the cooler. The owner then moved the cooler eight to twelve inches catty-corner to a gas cook stove. The owner, who was hot, sweaty and shirtless, bent down between the cook stove and the cooler. As he did so, his chest touched the outside aluminum casing of the cooler as his back touched the metal stove. He was electrocuted when the electric current traveled from the cooler through him to ground through the stove.

Case 7: On June 19, 2003, a 58-year-old bulldozer owner/operator died when he was thrown off the track of his bulldozer. The bulldozer owner/operator and a laborer were having difficulty starting the bulldozer. Together, the two men had tried several different methods to start the bulldozer including spraying ether into the air chamber, having the battery recharged, replacing the battery cables with new ones, and tightening wires to the starter. They worked from the left side track of the bulldozer. The laborer sat towards the front of the track tightening the wires to the starter while the owner stood on the track to the right of the laborer three to four feet away. As the laborer tightened the main lead wire to the starter, the owner stood on the track, leaned into the cab of the bulldozer and pushed the start button. The two men did not realize the dozer was in reverse gear. When the owner pushed the button, the bulldozer jumped backward, throwing the laborer off the side of the bulldozer track and throwing the owner underneath the track. The owner died at the scene from massive injuries to his pelvis and chest.

Case 8: The Kentucky Fatality Assessment and Control Evaluation program was notified July 31, 2003, via newspaper surveillance, of an occupational fatality involving a 55-year-old bulldozer owner/operator. On July 29, 2003, a bulldozer owner/operator drowned in the cab of his machine as he was trying to find a leak in a pond dam. The operator had been hired by a local farm owner to find and repair a leak in one of the ponds on her farm. As the operator dug a trench through the earthen dam, a section at the top collapsed sending sludge into the trench. The water/sludge mixture filled the cab of the bulldozer, trapping the operator inside. When the owner/operator did not return home as expected, his wife called the pond owner. The pond owner and the operator's wife searched the pond area for the bulldozer operator. They found the water-filled trench next to the pond, but not the bulldozer or the operator. Emergency medical services (EMS) were called to the pond. After arriving at the scene, EMS contacted a diver who then found the bulldozer



submerged in the water with the decedent inside. The coroner stated the cause of death as drowning.

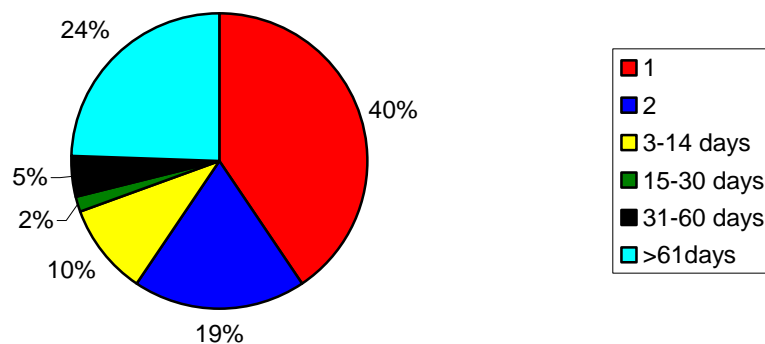
Case 9: On March 3, 2003, a 22-year-old Hispanic female laborer died when she fell from a roof. She had been working on the roof with her brother, who was a subcontractor for a local roofing company. The work crew consisted of two brothers and the decedent. Two days prior to the incident, the decedent had worked for her brother cleaning and organizing materials on the ground at another location. It was the decedent's first day on this job site. It is unknown whether or not the decedent had worked on other roofing jobs. Her job was to organize materials and hand her brothers tools. Just before falling, she had handed one brother a hammer. Neither brother saw her fall, but they heard the crash of guttering falling and found their sister on the ground below. She was not wearing any personal fall protection nor was a fall protection system in place at the time of the incident. She was transported to a local hospital where the coroner pronounced her dead "due to multiple blunt force injuries, due to fall from a great height".

### QUANTITATIVE ANALYSIS

#### *Identification of Cases*

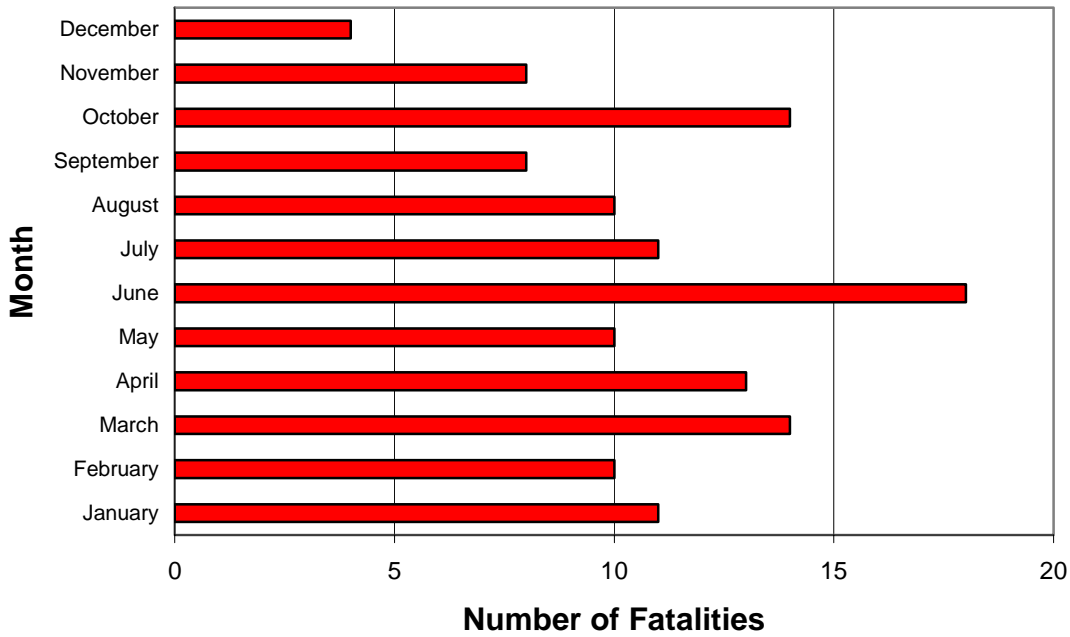
Newspapers were the primary source of case identification in 68% of all cases for 2003. KY FACE was informed of 60% of all occupational fatality cases within two days (Figure 1).

**Figure 1. Time of Initial Notification of Occupational Fatalities in 2003.**



The most worker deaths in a month occurred during June (n=18). Few occupational fatalities (n=4) were recorded in December (Fig. 2). Monday was the day of the week with the most worker deaths (Fig. 3).

**Figure 2. Kentucky Occupational Fatalities by Month-2003.**



**Figure 3. Occupational Fatalities by Day of Week-2003.**

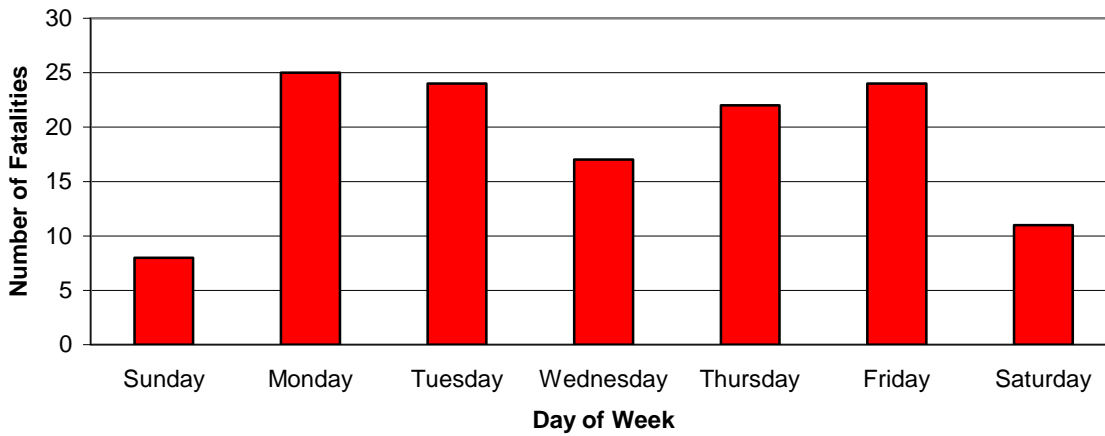


Figure 4 shows the time of day when most fatalities occurred from 1994-2003. Work fatalities were most common between 2pm and 4pm. As expected, few occurred between midnight and 6am.

Figure 4. Occupational Fatalities by Time of Day for 1994-2003.

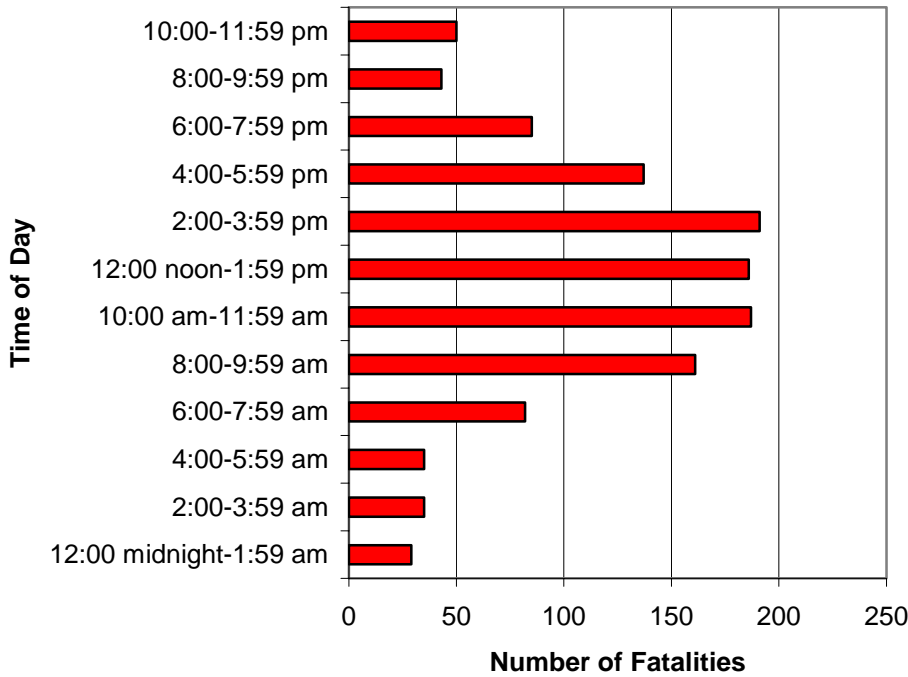
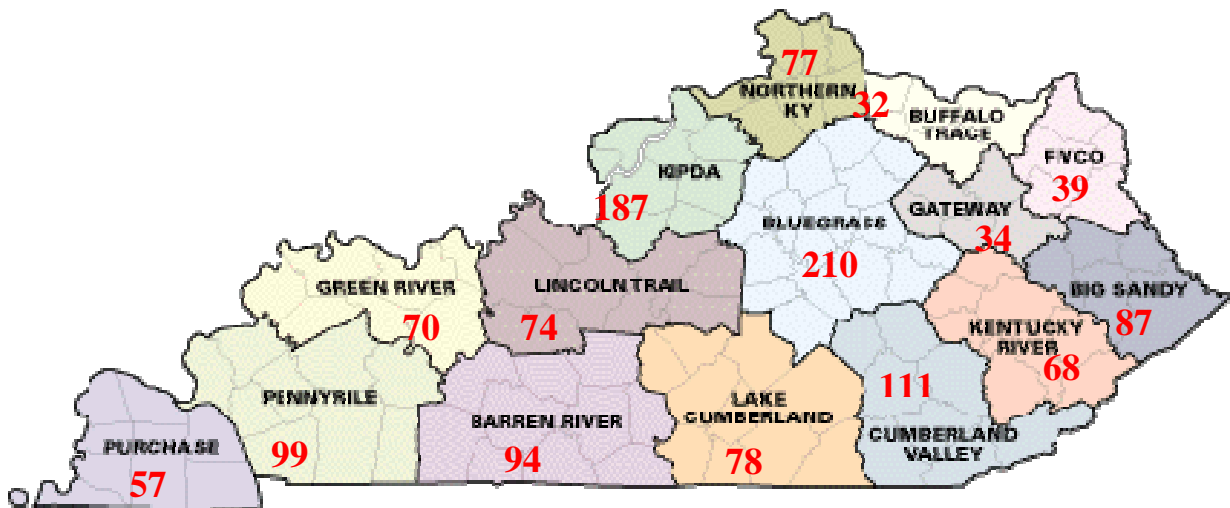


Figure 5 shows a map of Kentucky with the number of work-related fatalities that occurred in each Area Development District (ADD). ADD's are defined as partnerships of local governments, which provide for planned growth. The Bluegrass ADD (which includes Lexington-Fayette County) recorded the most fatalities with 210 for 1994-2003, followed by the KIPDA District (includes Louisville) with 187. The smallest number of occupational fatalities were recorded in the Gateway district (n= 34).

Figure 5. Number of Occupational Fatalities in Kentucky per Area Development District (ADD) (1994-2003).



Fayette County had the most fatalities in 2003 with 13, followed by Jefferson County with 8. Table 1 shows the fatality rate per 100,000 workers for counties using employment estimates. Perry County had the highest fatality rate because of fewer people employed by that county. The fatality rate in Laurel is also increased; the 7 worker fatalities in Laurel County were the result of one incident.

**Table 1. Fatality Rates for Counties with the Greatest Frequency of Occupational Fatalities in 2003.**

<b>County</b>	<b>Fatalities</b>	<b>Employment*</b>	<b>Rate per 100,000 Workers</b>
<b>Fayette</b>	13	139,960	9.3
<b>Jefferson</b>	8	360,432	2.2
<b>Laurel</b>	7	22,661	30.9
<b>Perry</b>	5	10,595	47.2
<b>Pulaski</b>	5	25,642	19.5
<b>Kenton</b>	5	76,709	6.5
<b>Total KY</b>	129	1,860,000	6.9

\*County employment estimates are from the 2002 Kentucky Deskbook of Economic Statistics. Kentucky Cabinet for Economic Development, Division of Research; Frankfort, KY.

Fatality numbers were calculated for all counties experiencing a fatality from 1994 to 2003 inclusive and are listed in Table 2. No worker deaths were reported in Menifee and Robertson counties in this 10-year period.

### ***Demographics***

Demographic characteristics of all workers fatally injured on the job for 1994-2003 are shown in Table 3. Ninety-four percent of all workers killed were male, and decedents were primarily white (92%). Sixty-eight percent of those killed were married. Seventy-three percent were high school graduates and 6% had a college degree (data only available for 2001-2003). Twenty-one percent of workers killed had less than a high school education. Foreign-born and English as a Second Language (ESL) workers accounted for 6% of all occupational fatalities (data only available for 2001-2003).

When 2003 in-state vs. out-of-state resident deaths were compared, sixteen (12%) of the 131 fatal incidents involved out-of-state residents who died while working in Kentucky.

**Table 2. Fatality Numbers for Kentucky Counties (1994-2003).**

<b>County</b>	<b>#</b>	<b>County</b>	<b>#</b>	<b>County</b>	<b>#</b>
Adair	11	Grant	3	Mason	14
Allen	5	Graves	10	Meade	4
Anderson	8	Grayson	9	Menifee	0
Ballard	6	Green	4	Mercer	9
Barren	15	Greenup	5	Metcalf	4
Bath	3	Hancock	5	Monroe	9
Bell	16	Hardin	32	Montgomery	14
Boone	19	Harlan	20	Morgan	9
Bourbon	10	Harrison	9	Muhlenberg	8
Boyd	13	Hart	12	Nelson	5
Boyle	6	Henderson	18	Nicholas	3
Bracken	8	Henry	10	Ohio	10
Breathitt	12	Hickman	3	Oldham	11
Breckenridge	8	Hopkins	20	Owen	7
Bullitt	10	Jackson	4	Owsley	1
Butler	4	Jefferson	135	Pendleton	6
Caldwell	4	Jessamine	12	Perry	21
Calloway	4	Johnson	5	Pike	49
Campbell	8	Kenton	19	Powell	3
Carlisle	3	Knott	4	Pulaski	26
Carroll	11	Knox	12	Robertson	0
Carter	9	Larue	4	Rockcastle	9
Casey	6	Laurel	20	Rowan	8
Christian	31	Lawrence	9	Russell	5
Clark	7	Lee	7	Scott	10
Clay	10	Leslie	7	Shelby	15
Clinton	5	Letcher	13	Simpson	6
Crittendon	3	Lewis	2	Spencer	3
Cumberland	5	Lincoln	12	Taylor	11
Daviess	18	Livingston	6	Todd	6
Edmonson	2	Logan	13	Trigg	15
Elliott	3	Lyon	6	Trimble	3
Estill	8	McCracken	18	Union	4
Fayette	56	McCreary	4	Warren	24
Fleming	8	McLean	4	Washington	3
Floyd	20	Madison	24	Wayne	1
Franklin	17	Magoffin	1	Webster	11
Fulton	4	Marion	9	Whitley	17
Gallatin	4	Marshall	8	Wolfe	3
Garrard	3	Martin	12	Woodford	12

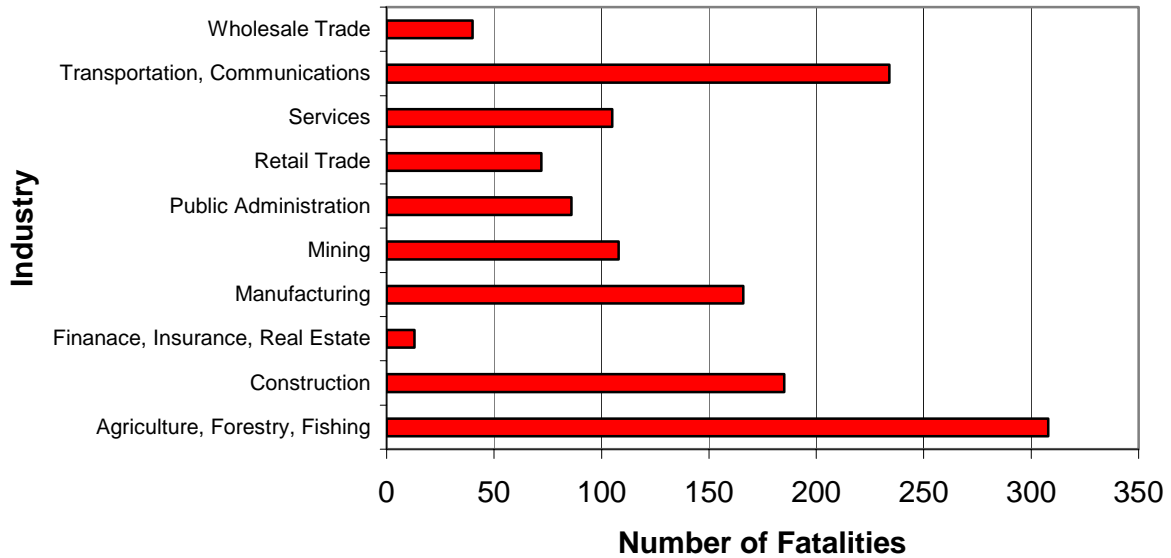
Table 3. Demographic Characteristics of Worker Deaths (1994-2003).

Characteristics	Number	Percent
<b>Total Fatalities</b>	1319	100%
<b>Sex</b>		
Male	1240	94%
Female	79	6%
<b>Race</b>		
White	1146	92%
Black	56	5%
Other	18	1%
Unknown	20	2%
Asian/Pacific Islander	4	<1%
<b>Age</b>		
<20	37	3%
20-29	192	15%
30-39	274	21%
40-49	303	23%
50-59	255	19%
60-69	139	11%
70-79	72	5%
80-89	37	3%
>90	5	<1%
Unknown	5	<1%
<b>Marital Status</b>		
Never married	170	14%
Married	821	68%
Divorced	194	16%
Widowed	27	2%
<b>Education</b> (2001-2003 data)		
Less than high school	60	25%
High school graduate	128	54%
Some college	30	13%
College graduate	15	6%
Unknown	3	<1%
<b>Country of Origin</b> (2001-2003 data)		
United States	338	94%
Mexico	5	1%
Other	10	3%
Unknown	8	2%
<b>Primary Language</b> (2001-2003 data)		
English	337	94%
Spanish	5	1%
Other	8	2%
Unknown	9	3%

*Industry*

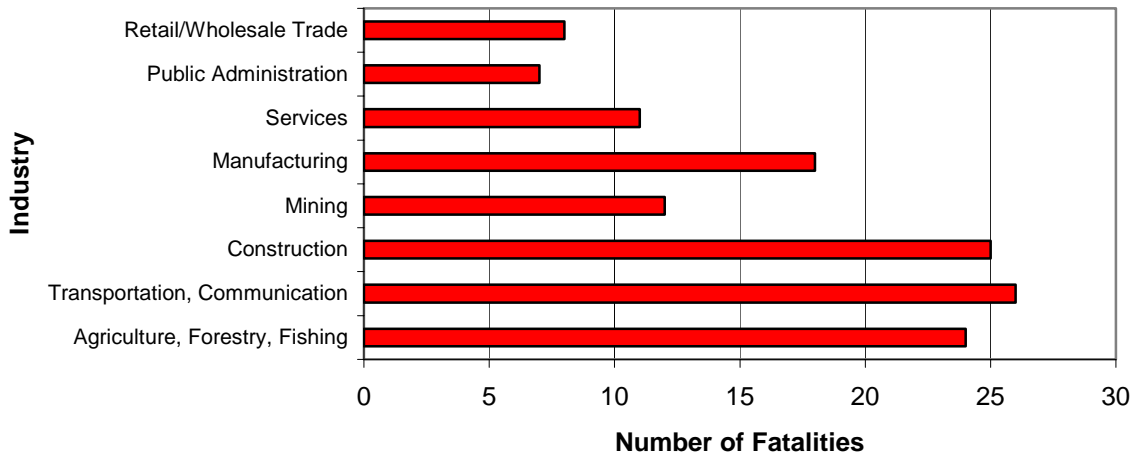
In the period 1994-2003, most of Kentucky’s work-related deaths occurred in the agriculture, forestry, fishing industry (23%) followed by the transportation, communications industry (18%) (Fig 6).

**Figure 6. Occupational Fatalities By Industry-(1994-2003).**



In 2003, most worker fatalities occurred in the transportation/communications industry (20%), the construction industry (19%), and the agriculture/forestry/fishing industry (18%) (Fig. 7).

**Figure 7. Occupational Fatalities by Industry- 2003.**



Occupational fatality rates are more than double the national rates for a number of Kentucky industries (Table 4), including agriculture/forestry/fishing industry, construction, and transportation/communications. Industries with low occupational fatality rates are the Public Administration, Retail/Wholesale trade, and the Finance industries.

**Table 4. Occupational Fatalities by Industry- 2003 (Rates calculated per 100,000 workers<sup>a</sup>).**

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

<sup>a</sup>Percent distribution of employed persons obtained from 1) 2001, 2002,2003 from *Geographic Profile of Employment and Unemployment*, US Department of Labor, Bureau of Labor Statistics, Washington, DC; 2) US DOE-EIA; Coal Industry Annual, 2002; 3) Kentucky FACE Program Annual Report 2001, 2002. Kentucky Injury Prevention & Research Center, 333 Waller Ave., Suite 202, Lexington, KY 40504-2915.

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

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

<sup>d</sup>Census of Fatal Occupational Injuries Summary. US Dept. of Labor, Bureau of Labor Statistics, National Census of Fatal Occupational Injuries Summary. US Dept. of Labor, Bureau of Labor Statistics, National Census of Fatal Occupational Injuries in 2002.

\*Transportation/Communications/Public Utilities

### ***External Cause of Death***

The most common cause of work-related fatal injuries is motor vehicle collisions (29%). Being struck by an object (15%), agricultural machines (12%), and falls (9%) were the other major external causes of death in Kentucky workers (Fig. 8).

In 2003, there were 40 job-related fatal motor vehicle collisions, comprising 31% of all occupational deaths (Fig. 9). The other major external causes of death in Kentucky workers were being struck by an object (15%), and ag machines (10%).



Figure 8. Occupational Fatalities by External Cause of Death- (1994-2003).

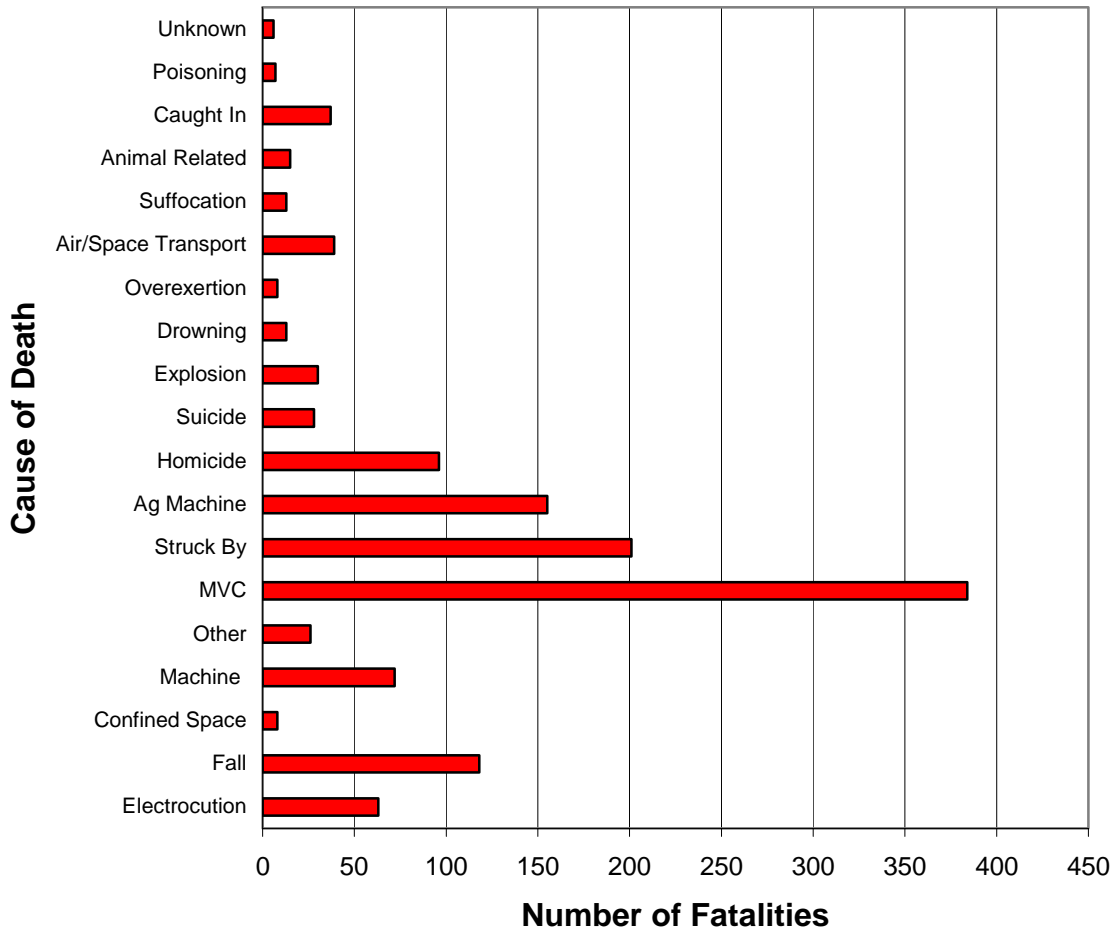
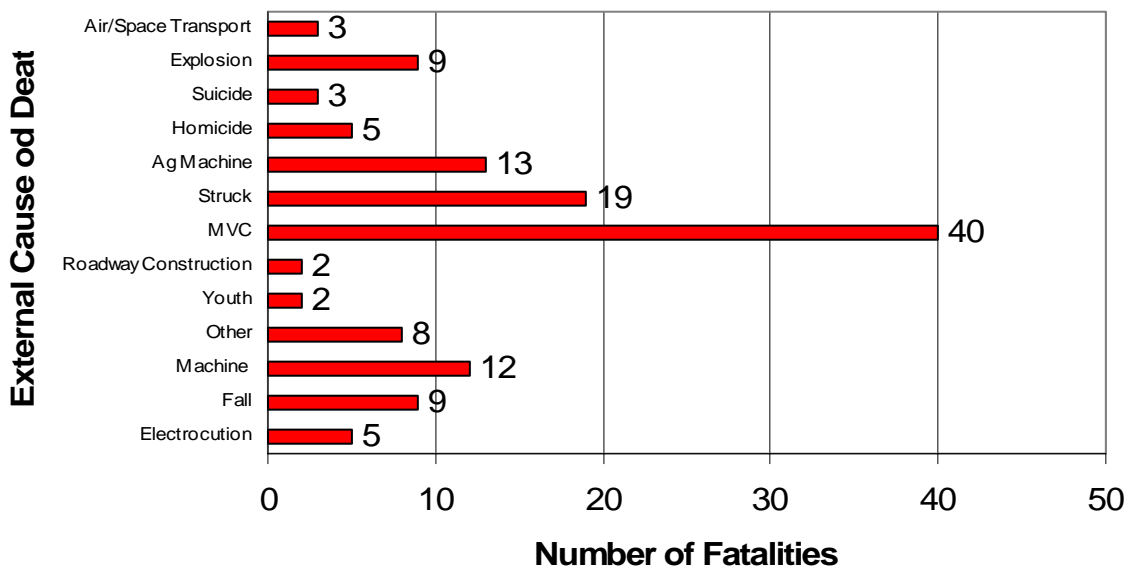
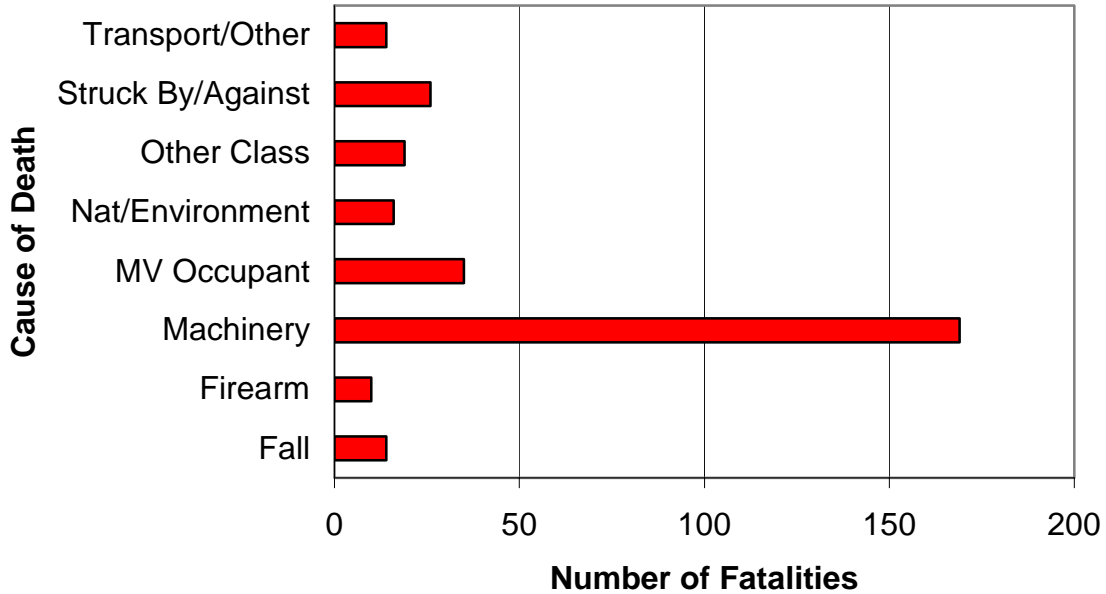


Figure 9. Occupational Fatalities by External Cause of Death- 2003.



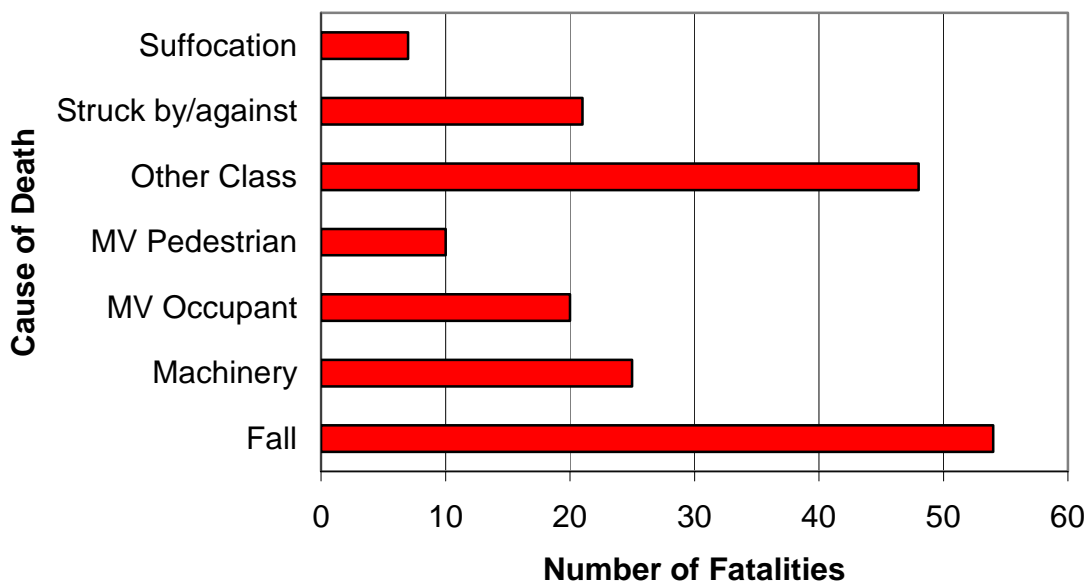
Machinery was the major cause of death (Fig. 10) in the agriculture/forestry/fishing industry (56%).

**Figure 10. External Cause of Deaths in the Ag/Forestry/Fishing Industry (1994-2003).**



The most common cause of worker deaths in the construction industry (Fig. 11) is falls (29%), followed by machinery (14%), and motor vehicle collisions (16% including both occupants and pedestrians). In 2003, there were 25 construction worker deaths. Seven involved machinery (28%), and 5 involved falls (20%).

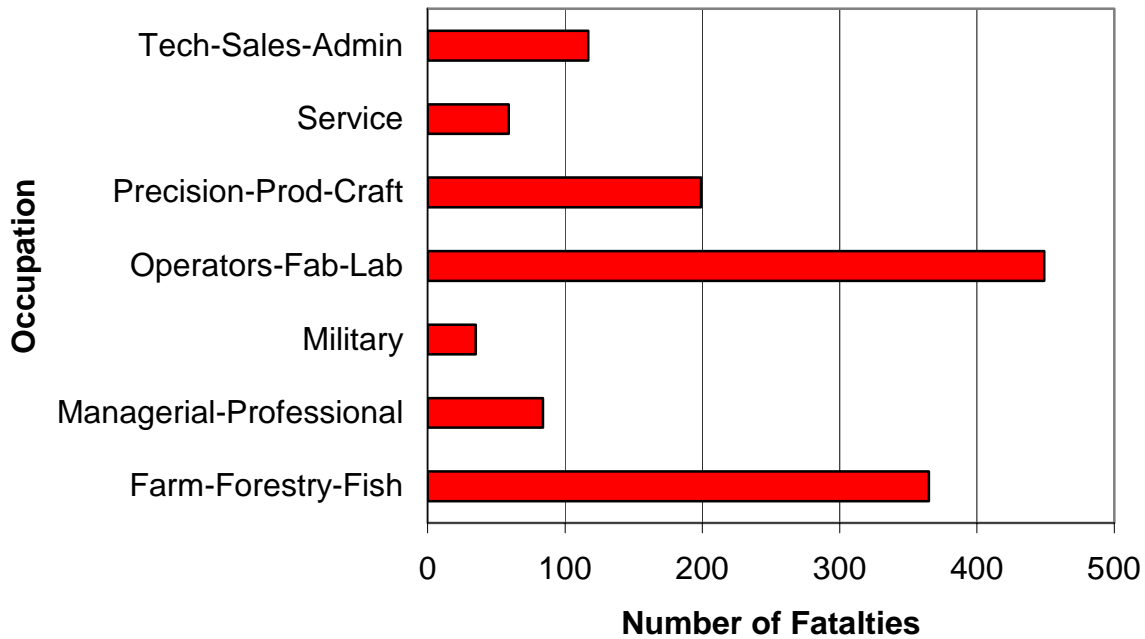
**Figure 11. External Cause of Deaths in the Construction Industry for 1994-2003.**



*Occupation*

Operator/Fabricator/Laborer occupations were the most dangerous for fatal work injuries (34%) from 1994-2003 and for 2003 alone. The next most hazardous occupations were farming/forestry/fishing (28%) and precision/production/crafts occupations (15%) (Fig. 12). Fatality rates for each major occupation category are shown in Table 5.

**Figure 12. Worker Fatalities by Occupation (1994-2003).**



**Table 5. Work-Related Fatality Rates by Occupation- 2003.**

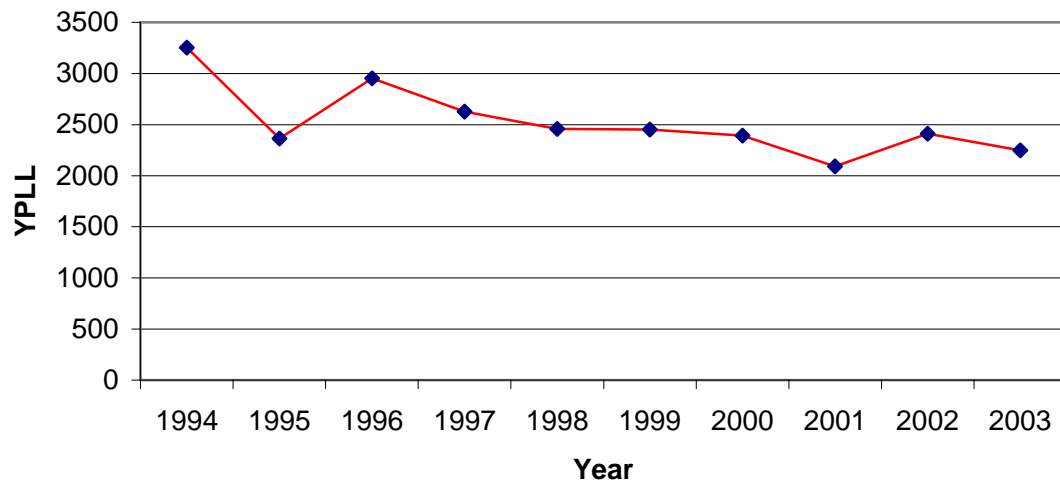
Occupation	Number (%)	KY Rate	US Rate
Operators, Fabricators, Laborers	47 (36%)	15.9	4.6
Farming, Forestry, Fishing	26 (20%)	46.4	18.0
Precision production, Craft, Repair	25 (19%)	13.5	4.3
Technical, Sales, Administrative Support	12 (9%)	2.3	0.6
Managerial, Professional specialty	11 (8%)	2.0	0.5
Service	9 (7%)	3.7	0.9
Military	1 (<1%)	n/a	n/a

<sup>a</sup> Employment figures and national occupational fatality numbers obtained from *Census of Fatal Occupational Injuries- 2002 data*, and *Geographic Profile of Employment and Unemployment, 2002*, US Department of Labor, Bureau of Labor Statistics, Washington, DC 20212-0001 . Rates were calculated as the number of occupational fatalities per 100,000 workers.

*Years of Potential Life Lost (YPLL)*

One hundred thirty-one Kentucky workers died in 2003 due to fatal occupational injuries with a total of 2248 YPLL (Fig. 13) based on age 65. YPLL was calculated as the age of the worker at death subtracted from the average age of retirement. The median age at time of death was 46 years of age, which is higher than the national average age of workers. The median age of the national labor force was 38.7 in 1998 and is projected to be 40.7 years in 2008. (<http://stats.bls.gov/opub/ted/2001/june/wk4/art02.htm>).

**Figure 13. Total Years of Potential Life Lost (YPLL) in Kentucky 1994-2003.**



In Table 6, the total and average YPLL were calculated per industry division. The industries with the highest average YPLL were mining and construction. The greatest total number of YPLL was in the construction industry. Future lost productivity could total as much as \$65.2 million dollars (Table 7) and the construction industry alone could lose approximately \$17.1 million dollars. This substantial total dollar amount is indicative of the continued need for targeted injury prevention strategies and interventions in the workplace.

**Table 6. Total and Average YPLL by Industry Classification for 2003.**

Industry	Total Fatalities	2003 Total YPLL	Average YPLL Per Fatality
Ag/Forestry/Fishing	24	325	13.5
Mining	12	276	23.0
Construction	25	513	20.5
Manufacturing	18	315	17.5
Transportation/ Public Utilities	26	363	13.7
Wholesale Trade	2	8	4
Retail Trade	6	116	19.3
Services	11	204	18.5
Public Administration	7	128	18.3
<b>Total</b>	<b>131</b>	<b>2248</b>	<b>16.5</b>

Table 7. Future Lost Wages by Industry-2003.

Industry Division	Average Salary <sup>a</sup>	Total Earnings Lost (in millions)	% of Total
Construction	\$33,271	\$17.1	26%
TCPU	\$38,691	\$14.0	21%
Agriculture/Forestry/Fishing	\$30,727	\$10.0	15%
Manufacturing	\$26,393	\$8.3	13%
Mining	\$22,171	\$6.1	9%
Services	\$21,808	\$4.4	7%
Retail Trade	\$19,713	\$2.3	4%
Public Administration	\$19,530	\$2.5	4%
Wholesale Trade	\$57,478	\$0.5	1%
<b>Total</b>		<b>\$65.2</b>	<b>100%</b>

<sup>a</sup>Average Salaries from *Employment and Wages-Kentucky, Annual Averages 2002*, U.S. Bureau of Labor Statistics, Washington, DC. Amounts are not adjusted for inflation.

## Special Topics

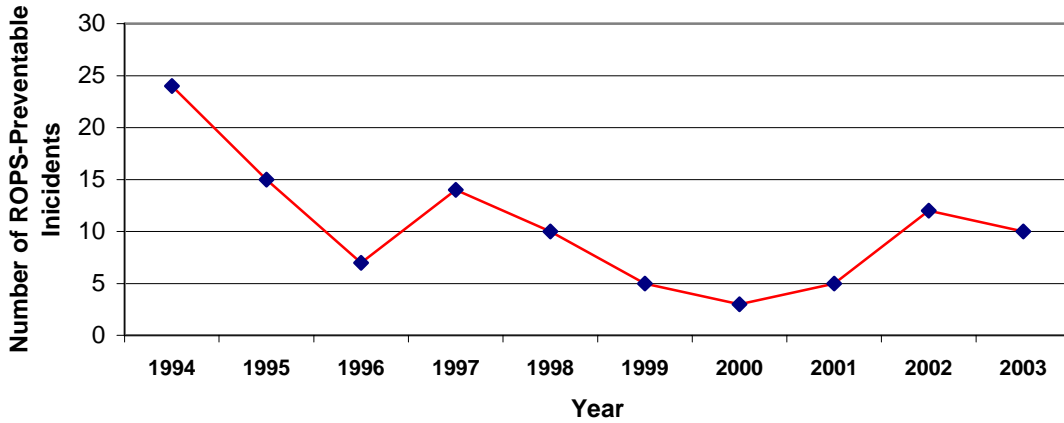
### *Fatal Tractor Injuries*



Farm tractor injuries are a major cause for concern in the United States. The agriculture/forestry/fishing (Ag) industry national fatality rate was 22.7 fatalities/100,000 workers in 2002. In comparison, Kentucky's ag industry fatality was more than double the national rate (46 deaths /100,000 workers). From 1994-2003, there were 308 Kentucky agricultural fatalities and 187 were tractor-related (61%). Factors contributing to tractor-related deaths were: tractor overturns (47%), fell off and run over (17%), other runovers (10%), and tractor collisions (14%). Fifty-six percent of the tractor-related fatalities involved a tractor-

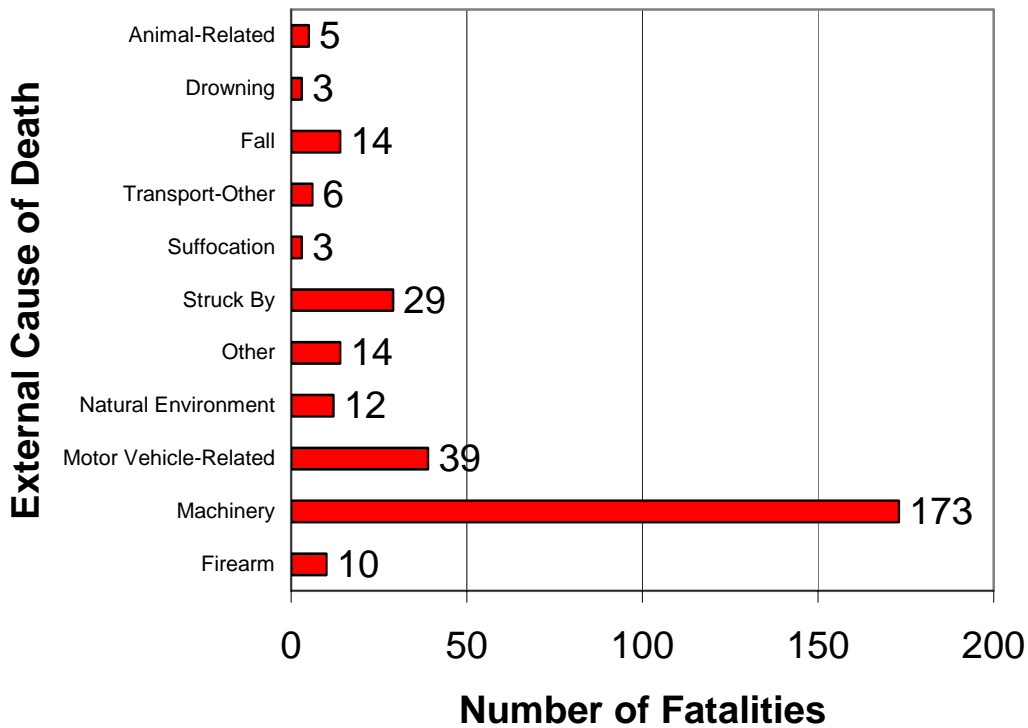
related overturn or fall-off where tractor was not equipped with a ROPS or safety belt. In our judgment, these could have been prevented by the use of a Rollover Protective Structure (ROPS) and seatbelts (Fig. 14).

**Figure 14. Number of ROPS-Preventable Tractor-Related Fatalities.**



When the external cause of death was examined, the majority of Ag deaths were due to machinery (Fig. 15).

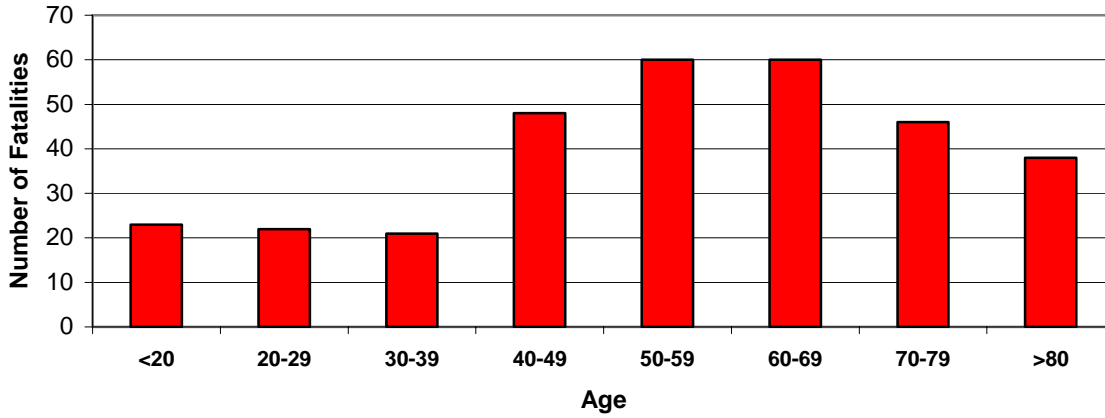
**Figure 15. External Cause of Death in Agricultural Fatalities**



The average age of the farmer who died on the job was 50-69 years of age (Fig. 16).



Figure 16. Agricultural Fatalities by Age Group (1994-2003).



*Self-Employed Workers*



Nationwide, self-employed workers comprise approximately 10% (7% unincorporated, 3% incorporated business) of the total workforce (BLS, CFOI, 2002 and US Census Bureau, 2000) and 19% of all worker deaths. From 1994-2003, there 1319 worker deaths in Kentucky and 23% (n=302) of the workers were self-employed.

The identification of self-employed worker deaths is based on a number of sources- death certificates, coroner reports, newspaper articles, among others. Death certificates alone do not identify all self-employed worker cases. When examining self-employed worker death certificates, the “injury at work” box was marked “yes” for only 68% of self-employed worker deaths. The “injury at work” box was checked “no” for 23%, “no response” for 5%, and

“unknown” for 3% of the death certificates. In addition, the “usual occupation” box did not match the working occupation at the time of death for 10% of the death certificates. The industry where the victim worked at the time of death did not match the “usual industry” for 61 cases (20%).

Over one-half (54%) of the self-employed worker deaths were in the agriculture, forestry, fishing industry, 10% in services, and 9% each in the construction and manufacturing industries (Fig.17). The most frequent external cause of death (Fig. 18) in self-employed workers was due to ag machines (28%), motor vehicle collisions (18%), being struck by (12%) and homicide (11%).

**Figure 17. Self- Employed Fatalities by Industry (1994-2003).**

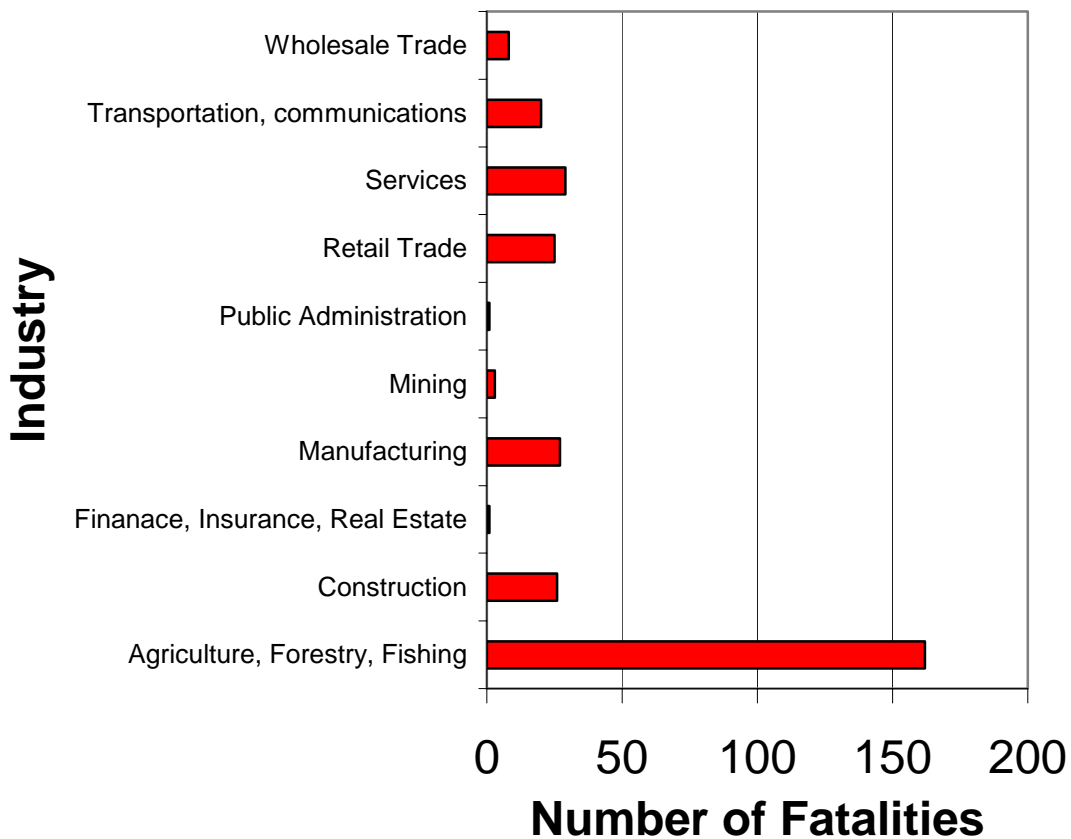
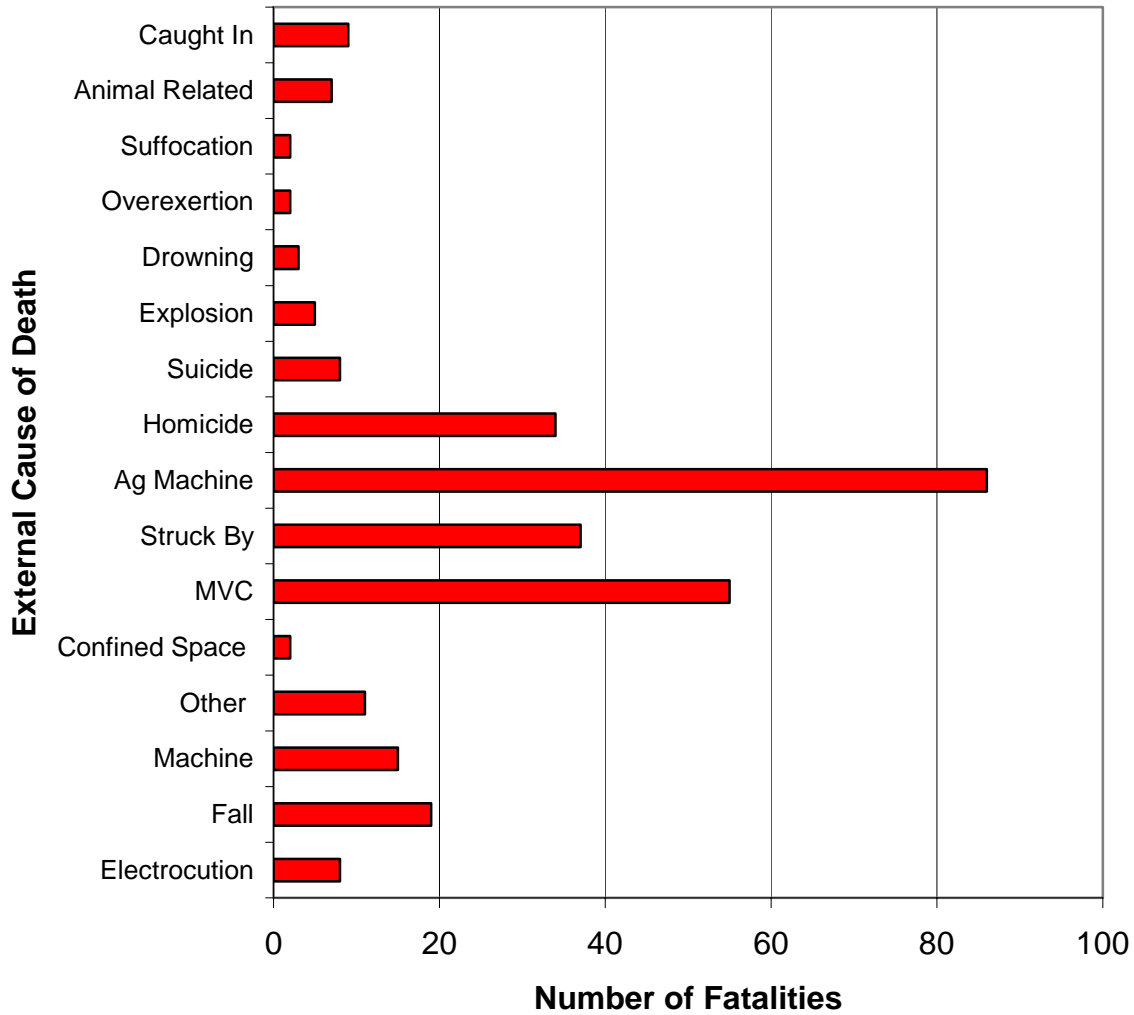




Figure 18. Self-Employed Fatalities by External Cause of Death (1994-2003).



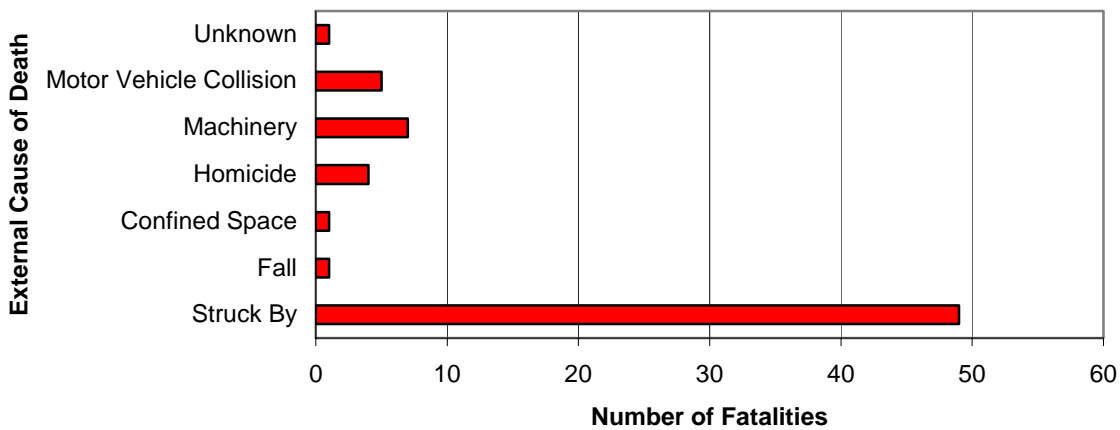
Self-employed workers were most frequently fatally injured in June (19%, only 2002-2003 data available), on a Tuesday (26%, 2001-2003 data), and 50-59 years of age (22%). Ninety-five percent were white, and 1% were Hispanic. Five percent were out-of state residents. One-third of the workers who were self-employed had less than a high school education.

*Fatal Logging Injuries*



From 1994-2003, there were 68 logging fatalities in Kentucky and in 2003, 4 logging deaths were recorded. Almost half of the loggers who died (44%) were between 30-44 years of age. Thirty-one percent finished high school and 28% had less than a high school education. The majority of the fatal logging incidents were caused by being struck by an object (72%) and 10% involved machinery (Figure 19).

**Figure 19. External Cause of Death in the Logging Industry, 1994-2003.**



One-third of the loggers who died were self-employed (Fig. 20). The logging occupation most at risk for a fatality is the logger himself/herself (88%). Only 10% of the logging fatalities involved truck drivers. There have been 4 logger deaths each recorded in Estill, Whitley, and Fleming counties and 3 logger deaths each in Adair, Bell, Breathitt, Harlan, Muhlenberg, and Cumberland counties.

**Figure 20. Employment Status of Loggers (1994-2003).**

### *Conclusion*

Of the 1319 worker deaths since 1994, 140 have been targeted for evaluation of the contributing factors (examining the pre-event, the event, and the post-event) for occupational fatalities. Ninety-eight evaluation reports including prevention recommendations were written and disseminated to similar industries and occupations. Fifteen Haz Alerts were produced and distributed to employers addressing motor vehicle collisions, machines including ag machines, falling objects, homicides, falls, electrocution and heat stroke. One Haz Alert (occupational motor vehicle collisions) alone reached 6000 employers/employees. Additionally, 13 peer-reviewed articles have been published by KIPRC using Kentucky FACE data.

While definite strides have been made regarding the prevention of Kentucky workplace fatalities in the last ten years, more effort is needed regarding the analysis of the contributing factors for worker deaths. With continued funding of the Kentucky FACE program including surveillance and evaluation data, further targeted intervention strategies and approaches can be developed for specific applications in high-risk industries and occupations.

## **REFERENCES**

*Alphabetical Index of Industries and Occupations*. 1992. U.S. Department of Commerce. Washington, DC: US Government Printing Office.

*International Classification of Diseases, Ninth Revision (ICD-9)*. 1993. Los Angeles CA: Practice Management Information Corporation.

Number of nonfatal occupational injuries and illnesses involving days away from work by selected worker characteristics and industry division, 2001, Bureau of Labor Statistics, U.S. Department of Labor.

Number of nonfatal occupational injuries and illnesses involving days away from work by selected worker and case characteristics and industry, Kentucky, private industry, 1992-2001, Bureau of Labor Statistics, US Department of Labor, May 22, 2003.