KENTUCKY FACE* PROJECT

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*Fatality Assessment and Control Evaluation

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KENTUCKY INJURY PREVENTION AND RESEARCH CENTER

OCCUPATIONAL INJURY PREVENTION PROGRAM

The Kentucky Fatality Assessment and Control Evaluation (KY FACE) Project is an

occupational fatality surveillance project of the Kentucky Injury Prevention and Research Center (KIPRC)*. Its primary purposes are to gather data on work-related fatalities and to develop prevention strategies, which are disseminated to employers, workers, agencies with interests in public health, and others who may be in a position to effect change.

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*Organizationally, KIPRC is part of the University of Kentucky College of Medicine. It maintains a contractual relationship with the Kentucky Department for Public Health (KDPH). Funding for the KY FACE Project is from a cooperative agreement between the National Institute for Occupational Safety and Health (NIOSH) and KDPH that is subsequently contracted to KIPRC.

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EXECUTIVE SUMMARY

During 1999, KY FACE staff identified and recorded 117 occupational fatalities. The categories designated by NIOSH as eligible for field investigation during this period were falls and machinery-related incidents; in addition, logging was selected by KY FACE staff as an area of concern.

In addition to investigative activities, following are some of the notable accomplishments of the KY FACE Project during its sixth year:

- KY FACE continued to disseminate prevention materials through agreements with (1) the American Pulpwood Association (APA) providing case reports to be used in *APA Safety Alerts* (circulation approximately 4,500) and (2) Southern States Cooperative, providing safety messages for inclusion in newsletters and for educational programs. These agreements went into effect early in FFY 1998.

- Agricultural safety display and handouts at Kentucky Farm Bureau (KFB) Annual Meeting, December 1999.

- FACE data used in public service announcements (PSA), newsletters, newspaper articles, and handouts for the Community Partners for Healthy Farming (CPHF) Project (*e.g.*, 1,479 radio PSA messages; more than 70 ROPS were purchased by farmers in the treatment counties).

- Poster display and handouts at KY Migrant Network Coalition Conference, Lexington, KY, April 1999

- Oral presentation, KY Coroners' Annual Conference, Louisville, KY, April 1999 (fifth consecutive year).

- Oral presentation, Governor's Safety and Health Conference, Louisville, KY, May 1999.

- UK Forestry Department prepared a Bulletin based on FACE data, which it distributed to approximately 1,000 individuals and organizations in its newsletter, and used this newsletter in its Master Logger Program classes. UK Forestry Department also included a FACE-generated *Logging Hazard Alert* in another newsletter.

- Expansion of web-based material to include a complete description of data collected 1994 through 1999. All FACE reports are available on the site.

- A logging safety video was produced which demonstrates safe unloading of logging trucks. This video is used during the KY Master Logger training sessions across the state.

- Three thirty second Television Public Service Announcements were produced promoting Rollover Protective Structures (ROPS) for tractors. These have been aired by television stations throughout the state.

- Occupational fatalities can now be mapped on the KIPRC website (http://www.kiprc.uky.edu/dcerts.html).

- Assistance was provided to D. Shleenbaker to complete a Masters thesis on female occupational homicides. This included using FACE and CFOI data and conducting on-site surveys of businesses that had been robbed and those that had not been robbed. Material from the thesis will be considered for a manuscript.

PROGRESS TOWARD PROGRAM OBJECTIVES

Following are some of the goals that were set by KY FACE staff at the beginning of 1999, and, for each, a brief evaluation of progress made:

Objective 1) Continue working with CFOI, coroners, State Police, and other agencies to ensure that a minimum of occupational fatalities go unreported.

Frequent comparisons of findings with the Labor Department's Census of Fatal Occupational Injuries (CFOI) program indicate that KY FACE is missing no cases, and, in fact at times, reveals cases previously unknown to CFOI.

Objective 2) Complete First Reports and Supplements (when appropriate) on all occupational fatalities and transmit data to NIOSH in an accurate and timely fashion.

While first reports and supplements have been completed in an accurate and timely fashion, data transmission to NIOSH has not. This is due, in part, to the changeover at NIOSH from Epi-Info to Access, and the requested hold of data that resulted during the transition, and in part due to the staffing situation of the KY FACE project for much of the year. We fully expect to be current on our data transmission to NIOSH at or near the time that this report is printed. Once "caught up," our data transmissions will become and remain timely.

Objective 3) Complete at least 12 on-site investigations of occupational fatalities in designated categories during 99.

Due to staff changes and position vacancies during this year, we investigated 3 cases. We plan to investigate any future occupational fatalities within scope.

Objective 4) Continue to develop and expand dissemination methods to communicate FACE results, program activities, goals, and priorities.

FACE staff (and others during vacancies) have responded to 42 requests for FACE data, which is slightly more than last year (39), indicating continued and increasing awareness of the existence of KY FACE and interest in the project's results.

Tim Struttmann taught an Agriculture Safety class at the University of Kentucky which relied heavily on and presented KY FACE data acquired over the years.

The Community Partners for Healthy Farming Project has continued to use KY FACE data in the development of agricultural safety information, particularly messages designed to increase farmers retrofitting their tractors with rollover protective structures.

Objective 5) Collaborate with KIPRC's Community Injury Prevention Program and the Center for Transportation Research about occupational deaths in MVCs.

Data from the Fatality Analysis Reporting System (FARS) was linked electronically with the KY FACE data to gain additional information about the occupational deaths due to motor vehicle crashes. An abstract was submitted and accepted for presentation at the Fifth World Conference on Injury Prevention and Control.

Objective 6) Submit abstracts to professional meetings and publish results.

An oral presentation was given at the KY Coroners' Annual Conference in April, and the Governor's Safety and Health Conference and Exposition, which was held in May.

Amy Scheerer used KY FACE data in an oral presentation, "Logging Fatalities Due to Logs Rolling Off Trucks," at the American Public Health Association (APHA) Annual Meeting held in Chicago, November 1999.

Tim and Amy submitted a manuscript to American Journal of Industrial Medicine titled "Fatal Injuries at Sawmills Due to Logs Rolling Off Trucks at Sawmills – Kentucky 1994-1998. Reviewers comments were addressed and it was re-submitted.

Objective 7) Finish logging video.

The logging safety video was finished and has, as anticipated, been incorporated into the Kentucky Department of Forestry's Master Logger Program. We have already received several requests for copies of this video. This is also available on the KIPRC website, www.kiprc.uky.edu.

Objective 8) Write article based on occupational fatality data in Kentucky to be submitted to peer-reviewed journal (CFOI vs. FACE analysis, data linkage project).

Because of staffing situations, this objective was not met. It remains an area of interest and, therefore, this objective has been carried over for the next fiscal year.

Objective 9) Hire and train a new investigator and project manager.

Mike Pope was hired as the KY FACE Project Manager in January. Since that time he has received training and direction from Tim Struttmann and has visited Morgantown, WV, for informal introductions and a question/answer session with individual key personnel at NIOSH. We are currently searching for and planning to hire a FACE Field Investigator. We have received and reviewed several applications and are planning to conduct interviews and make final decisions as soon as possible. Both Mike and the new Field Investigator will attend NIOSH investigator training in Morgantown when offered.

Objective 10) Finish qualitative analysis of survivors interviews.

Families who experienced a farming-related death were identified through KY FACE records. Nine interviews were conducted with 10 participants. Transcripts were stored and analyzed using NUDIST software. A manuscript is in progress describing the experiences of the seven widows who participated. Another manuscript is planned regarding data from the follow-up questionnaires that were sent to each participant.

SURVEILLANCE PROGRAM

During 1999 the KY FACE Project continued to develop and expand its network of notification sources while maintaining the relationships formed in its prior years of operation. The following is a list of currently active sources:

- County coroners and deputy coroners
- Kentucky Labor Cabinet, Census of Fatal Occupational Injuries (CFOI)
- Kentucky Labor Cabinet, Occupational Safety and Health (OSH)
- Community Partners for Healthy Farming (CPHF) Project
- State Vital Statistics Registrar
- Emergency Medical Services offices
- Southeast Center for Agricultural Health and Injury Prevention (SCAHIP)
- Kentucky State Police, Fatal Accident Reporting System (FARS)
- County Cooperative Extension offices
- Kentucky Water Patrol
- Mining Safety and Health Administration (MSHA)
- Print and electronic media news reports

INVESTIGATION PROGRAM

The KY FACE Project continues to conduct on-site investigations of occupational fatalities which fall into the NIOSH-designated categories of machinery related incidents and falls, as well as logging incidents which were designated as a target area by Kentucky. Added later in the year to the NIOSH focus, were highway construction zones and youth workers (<18 years). Agriculture remains the leading industry for work-related deaths in Kentucky.

A table of incidents that were either investigated, completed, or both by KY FACE during 1999, follows:

Demographic Info. Sex	Age	Manner of Death, Case #	Industry	Occupation	Circumstances	Key Recommendations
M	62	Machine (Tractor) #98KY072	Agriculture	Farmer	Victim was driving a tractor with an attached rotary mower mowing tall (about 5 feet) weeds and brush when he struck an above ground valve of a natural gas pipeline which exploded and caught the tractor on fire.	• Above ground pipes and valves need to be clearly visible at all times. • Regulations should be considered for maintaining the area around above ground pipes and valves. • Above ground sections of pipelines should be regularly checked for visibility and condition.
M	42	Struck By #98KY099	Logging	Logger	Victim was struck by a log that rolled off of a log truck at a sawmill as he loosened the binding chains.	• The height of the stack of logs should not exceed the standards on the truck. • Sawmill operators should enforce safe unloading procedures such as not releasing binders until a loader is able to secure the load of logs. • Loggers/truck drivers should ensure that binders/chains sufficiently secure the logs to avoid movement during transit.

Demographic Info. Sex	Age	Manner of Death, Case #	Industry	Occupation	Circumstances	Key Recommendations
M	31	Struck By #98KY103	Logging	Truck Driver	Victim was struck by a log that rolled off of a log truck at a sawmill as he was preparing it to be unloaded.	• The height of the stack of logs should not exceed the standards on the truck. • Binders should not be released prior to securing with an unloading device. • Binders should only be released from the side on which the unloader operates except when the person making the release is using a remote control device or is protected by racks.
M	58	Fall #98KY115	Retail	Delivery Truck Driver	Victim was standing on a storage rack about 48" high handing down items to be loaded into a truck when he fell striking his head on a concrete floor.	• Employees should use ladders or moveable stairs when retrieving materials that cannot be reached from floor level. • A written policy should be developed regarding when ladders or moveable stairs are required and how they are to be used. • Employees should be trained about the policy and how to identify and address fall hazards in the workplace.

Demographic Info. Sex Age	**Manner of Death, Case #**	**Industry**	**Occupation**	**Circumstances**	**Key Recommendations**
M 33	Machine (Tractor) #98KY116	Construction	Construction Worker	Victim was attempting to turn a tractor around on a road in preparation for loading onto a trailer when he drove too close to the edge of the road and went over a bank and overturned.	• All tractors should be equipped with ROPS and seatbelts worn at all times. • Tractor operators should always examine the area, take into consideration environmental conditions and terrain, and make necessary adjustments to accommodate to them.

PREVENTION/INTERVENTION ACTIVITIES

Upon completion of each investigation report (example, Appendix A), copies were provided to the employer, if applicable, to the coroner involved, and to any witnesses or others who assisted with the investigation. These reports are also available to others (*e.g.*, presentation audiences) via a request form or the KIPRC website. A sample form is included as Appendix B.

FACE Hazard Alerts, newsletters and other NIOSH handouts were distributed at many statewide conferences (*e.g.*, for safety and health professionals, coroners, emergency medical service personnel, the agricultural community). In addition, prevention materials were periodically distributed to the state's 120 county extension agents, postage free, through the UK Department of Agriculture, which distributes packets weekly to all agents.

FACE staff members made oral presentations during 1999 to the following groups: the State Coroners' Association; the Governor's Safety and Health Conference; and the American Public Health Association Conference. These presentations served to expand our network of notification sources and also increased the number of requests for FACE data.

The educational module developed and initiated in FFY 1995 for coroners and deputy coroners was continued. This is an on-going project related to accurate completion of death certificates with respect to work-relatedness.

QUANTITATIVE ANALYSIS

Kentucky FACE identified 117 fatal occupational injuries during 1999. The following section provides a descriptive analysis of the KY FACE data for that year.

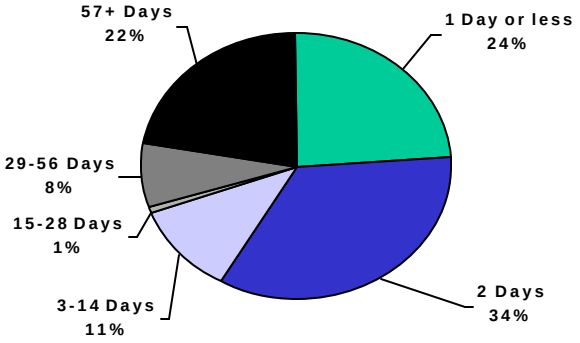
Notification of Cases

Newspapers were the most common source of initial notification (Table 2). FACE was informed of 58 percent of the cases within two days (Figure 1), compared to 53 percent in FFY1998. After a case was identified, a variety of other sources was used to gather additional details about the fatal incident, including death certificates, coroners, employers, law enforcement officers, Mining Safety and Health Administration (MSHA) reports, autopsy and toxicology reports, and interviews with witnesses and family members during investigations.

Table 2. Initial Sources of Notification

Source	Percent of Cases
Newspapers	63%
Vital Statistics	16%
KY State Police Fatal Accident Reporting System (FARS)	11%
Coroners	2%
Census of Fatal Occupational Injuries (CFOI)	6%
Community Partners for Healthy Farming	1%
Emergency Medical Services	1%

Figure 1. Initial Notification Times



When and Where

Figure 2 shows the number of fatalities that occurred each month during the year. The peak month was July (n=15), followed by March, April, May, June, and November (n=11 for all). February had the fewest occupational fatalities during 1999 (n=6).

Figure 2. Fatalities Per Month

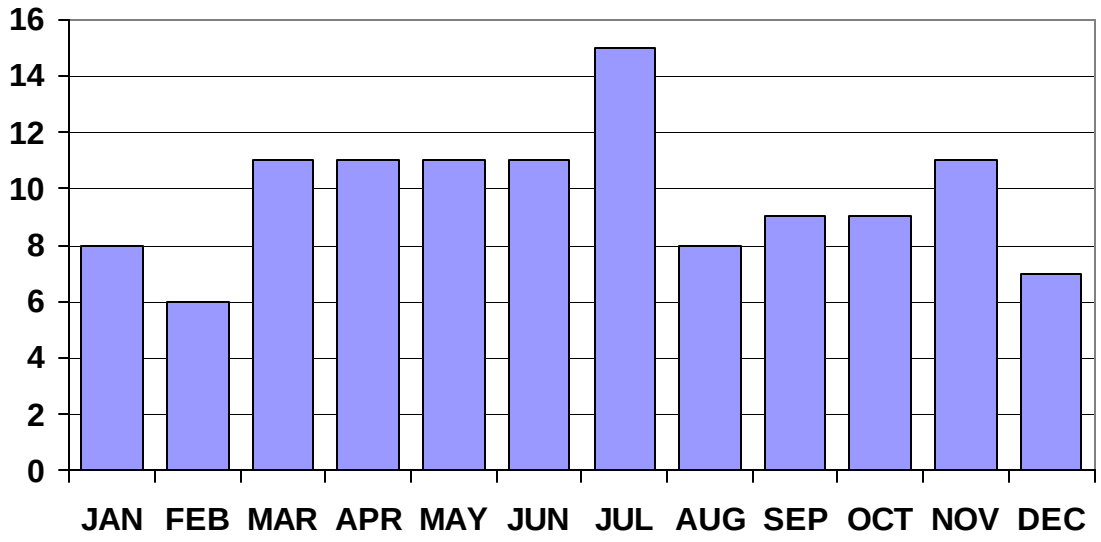
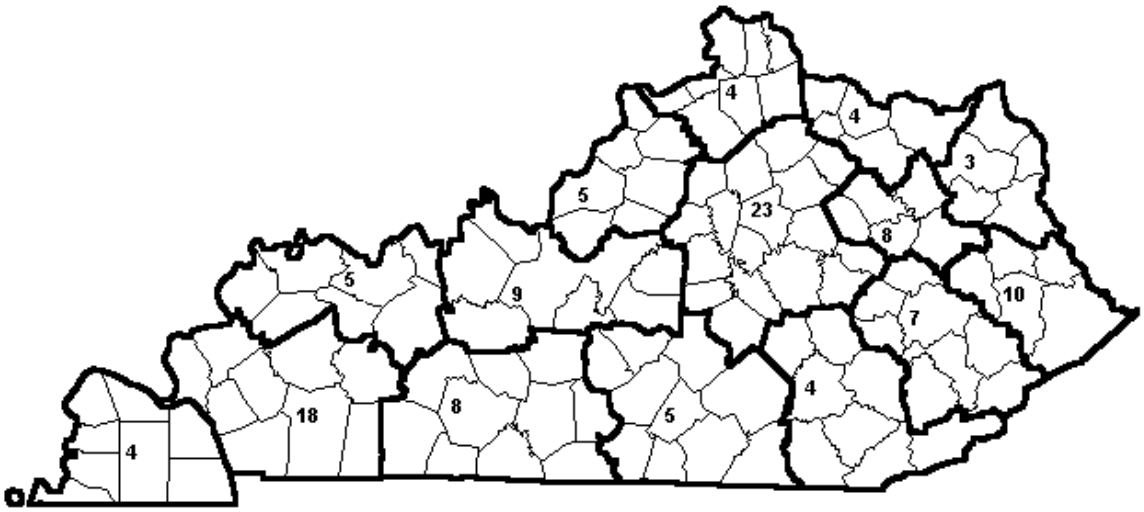


Figure 3 shows a map of Kentucky with the number of work-related fatalities that occurred in each Area Development District. The Bluegrass District (the area development district that includes Lexington-Fayette County) had the most fatalities with 23, followed by Pennyrile (the district that includes Fort Campbell) with 18, and Big Sandy with 10.

Figure 3. Number of Occupational Fatalities in Kentucky per Area Development District (ADD)



Sixty-three of Kentucky's 120 counties had at least one occupational fatality during 1999. Christian County had the most fatalities with eleven, followed by six counties having four each, including Breathitt, Fayette, Floyd, Hardin, Pike, and Rowan. Table 3 shows the fatality rate per 100,000 workers for each of these seven counties using employment estimates. It is interesting to note that while Christian County had almost three times as many fatalities as Breathitt County, the rate per 100,000 workers in Breathitt was more than two times that of Christian. This is due to the relatively high number of employed persons in Christian County as compared to Breathitt.

Table 3. Fatality Rates for Counties with the Greatest Frequency of Occupational Fatalities During 1999

County	Fatalities	Rate per 100,000 workers*
Christian	11	48
Breathitt	4	101
Fayette	4	3
Floyd	4	31
Hardin	4	12
Pike	4	16
Rowan	4	49
Total KY	117	7

*1996 employment estimates from the 1998 Kentucky Deskbook of Economic Statistics, Kentucky Cabinet for Economic Development, Division of Research; Frankfort, KY; 1998. The Kentucky Deskbook of Economic Statistics was used because county specific employment estimates were not available in the Geographic Profile of Employment and Unemployment bulletin.

Fatality rates were calculated for all counties experiencing a fatality in 1999 and are listed in Table 4. Fifty-four of Kentucky's counties had fatality rates that exceeded the state average of seven. Fatality rates were much higher than Kentucky's average in several counties, including Breathitt (101), Fleming (52), Rowan (49), and Christian (48) counties. While the relatively low number of workers contributed to the high fatality rates in Breathitt (3,964 employed persons), Fleming (5,811 employed persons), and Rowan (8,197 employed persons) counties, this was not the case in Christian County (23,148 employed persons). Instead, it was the alarming number of deaths (11) that were responsible for this high rate. Of these, ten were military and one was a contractor working on military grounds.

Table 4. Fatality Rates for Counties Experiencing a Fatality in 1999

County	*Fatality Rate**	*County*	*Fatality Rate*	*County*	*Fatality Rate*
Breathitt	101	Bath	21	Ohio	11
Fleming	52	Carter	21	Johnson	11
Rowan	49	Monroe	19	Bourbon	11
Christian	48	Knott	19	Lincoln	10
Carlisle	39	Rockcastle	18	Meade	10
Todd	39	Trigg	18	Perry	10
Butler	38	Caldwell	17	Grayson	10
McCreary	35	Jessamine	16	Madison	9
Martin	35	Pike	16	Pulaski	9
Trimble	34	Garrard	16	Logan	8
Nicholas	33	Whitley	16	Marshall	8
Floyd	31	Letcher	15	Scott	7
Harrison	29	Simpson	14	McCracken	6
Montgomery	29	Oldham	14	Barren	6
Breckenridge	27	Henderson	14	Boone	5
Crittenden	25	Hart	13	Hopkins	5
Woodford	25	Franklin	13	Fayette	3
Clinton	25	Marion	12	Daviess	2
Owen	23	Harlan	12	Warren	2
Livingston	22	Mason	12	Kenton	1
Lawrence	22	Hardin	12	Jefferson	<1

* Rates were calculated per 100,000 workers using employment estimates from the 1998 Kentucky Deskbook of Economic Statistics, Kentucky Cabinet for Economic Development, Division of Research; Frankfort, KY; 1998. The Kentucky Deskbook of Economic Statistics was used because county specific employment estimates were not available in the Geographic Profile of Employment and Unemployment Bulletin.

Demographics

Demographic characteristics of the workers fatally injured on the job are shown in Table 5. Those killed on the job in 1999 were primarily white (83%; there were 14% unknown) and male (95%). Ages ranged from 20 through 88, with a median of 42. During FFY 1998 (October 1, 1997-September 30,1998), only 47 percent of those age 60 and over were farmers (n=9). During 1999, however, farmers accounted for 75 percent of this age range (n=12). Also of significance for 1999, there were no occupational fatalities in the less than 20 age group, which includes one of the newly designated NIOSH target areas (youths, age<18).

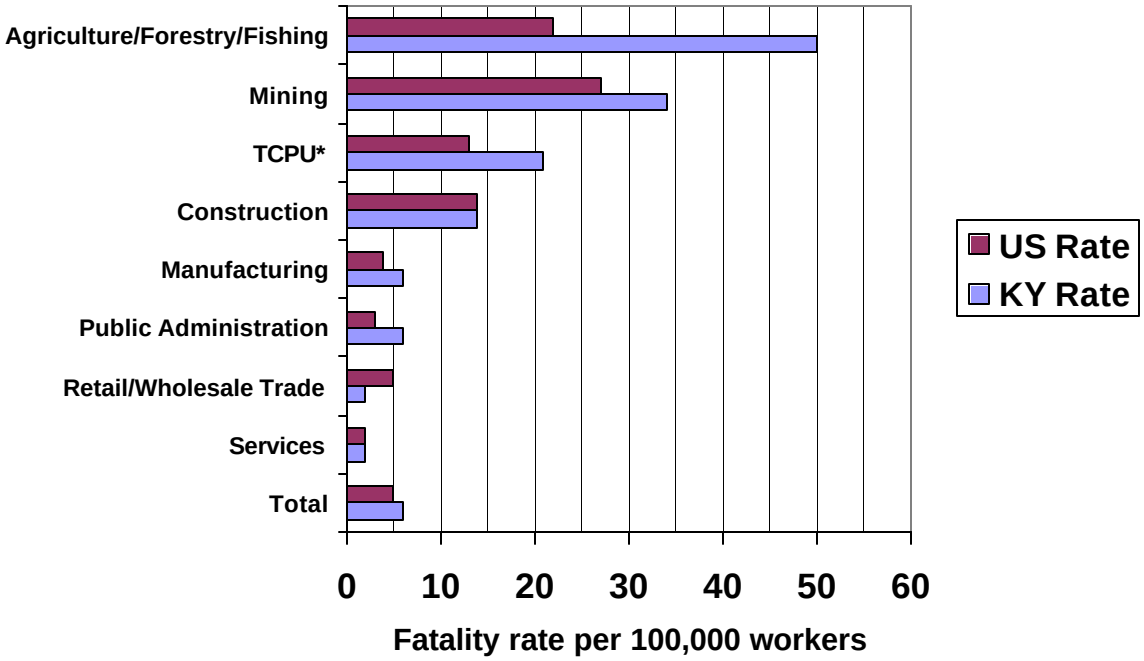
Table 5. Demographic Characteristics, 1999

Characteristic	Number	Percent
Total Fatalities	117	100
Sex		
Male	111	95
Female	6	5
Race		
White	97	83
Black	2	2
Other	1	1
Unknown	17	14
Age		
20 - 29	25	22
30 - 39	20	17
40 - 49	35	30
50 - 59	19	17
60 - 69	8	7
70 - 79	6	5
Unknown	2	2
Marital Status		
Never married	15	13
Married	67	57
Divorced	19	16
Unknown	16	14
Education		
Less than high school	22	19
High school graduate	42	36
Some college	7	6
College graduate	6	5
Unknown	40	34

Industry

Figure 4 and Table 6 show the number of workers killed in each industry division (as classified by the *Standard Industrial Classification Manual),* as well as a comparison of state and national rates. The division of Agriculture/Forestry/Fishing again made up the largest portion (18%, n=21) of work-related deaths in Kentucky. The fatality rate for the Agriculture/Forestry/Fishing division is much higher than other industries because employment estimates for farmers includes only those who farm full-time. Since many of Kentucky's farmers have other jobs and farm only part-time, the number of those working in the agriculture industry is underestimated, and therefore, inflates the fatality rate for this division.

Figure 4. Occupational Fatality Rates by Industry, 1999[a]



*Transportation/Communication/Public Utilities

[a]Percent distribution of employed persons obtained from *Geographic Profile of Employment and Unemployment, 1997 (Bulletin 2515).* US Department of Labor, Bureau of Labor Statistics; June 1999.

Agriculture continues to be the most dangerous industry in Kentucky, accounting for all (n=21) of the incidents in the division of Agricultural/Forestry/Fishing. Also notable in this industry, over one-half (58%) of the farmers killed (n=19) were age 60 or older. On a positive trend, the proportion of occupational fatalities represented by agricultural machines has been steadily decreasing. It has dropped from 20 percent in FFY 1996 to 15 percent in FFY 1997, to 11 percent in FFY 1998 to a four-year low of 9 percent for 1999. While the percentage of agricultural machinery related deaths has indeed dropped, it still accounts for nearly half (48%) of the Agriculture/Forestry/Fishing industries fatalities.

Table 6 includes the percentage of workers in each industry division for comparison with the percentage of fatalities in each division. This comparison again illustrates the high risk of agricultural workers, as this division is made up of only two percent of the workers in Kentucky, but accounts for 18 percent of the occupational fatalities.

Professional truck drivers accounted for 71 percent (n=15) of the fatalities in the transportation/communications/public utilities (TCPU) industry division. Of the 19 deaths in the manufacturing industry, eight (42%) were due to logging operations (logging is classified as a manufacturing industry). Sixty-three percent (n=5) of the deaths related to logging were caused by falling limbs/trees, while the remainder (n=3) were homicides.

Table 6. Occupational Fatalities by Industry, 1999 (Rates calculated per 100,000 workers[a])

Industry[b]	Number of Fatalities (%)	Percent of Employment[c]	1999 KY Rate	1998 KY Rate	1997 KY Rate	US Rate[d]
Ag/Forest/Fishing	21 (18)	2.3	50	54	72	22
TCPU*	21 (18)	5.9	20	20	31	13
Manufacturing	19 (16)	17.1	6	5	5	4
Public Administration	16 (14)	13.9	6	2	3	3
Construction	13 (11)	5.1	14	18	21	14
Services	10 (8)	22.7	2	2	2	2
Mining	9 (8)	1.3	38	34	32	27
Retail/Whse Trade	7 (6)	20.1	2	3	6	4
Finance/Ins/Real Estate	1 (1)	4.5	1	0	1	2
Totals	117 (100)	92.9	7	6	9	5

[a] Percent distribution of employed persons obtained from 1) 1999 from *Geographic Profile of Employment and Unemployment, 1997 (Bulletin 2515).* US Department of Labor, Bureau of Labor Statistics; June 1999; 2) 1998 from *Geographic Profile of Employment and Unemployment, 1996 (Bulletin 2498).* US Department of Labor, Bureau of Labor Statistics; April 1998; 3) 1997 from *Geographic Profile of Employment and Unemployment, 1995 (Bulletin 2486).* US Department of Labor, Bureau of Labor Statistics; February 1997.

[b]Office of Management and Budget. *Standard Industrial Classification Manual*. 1987. Springfield VA: National Technical Information Service. (NTIS No. PB 87-100012)

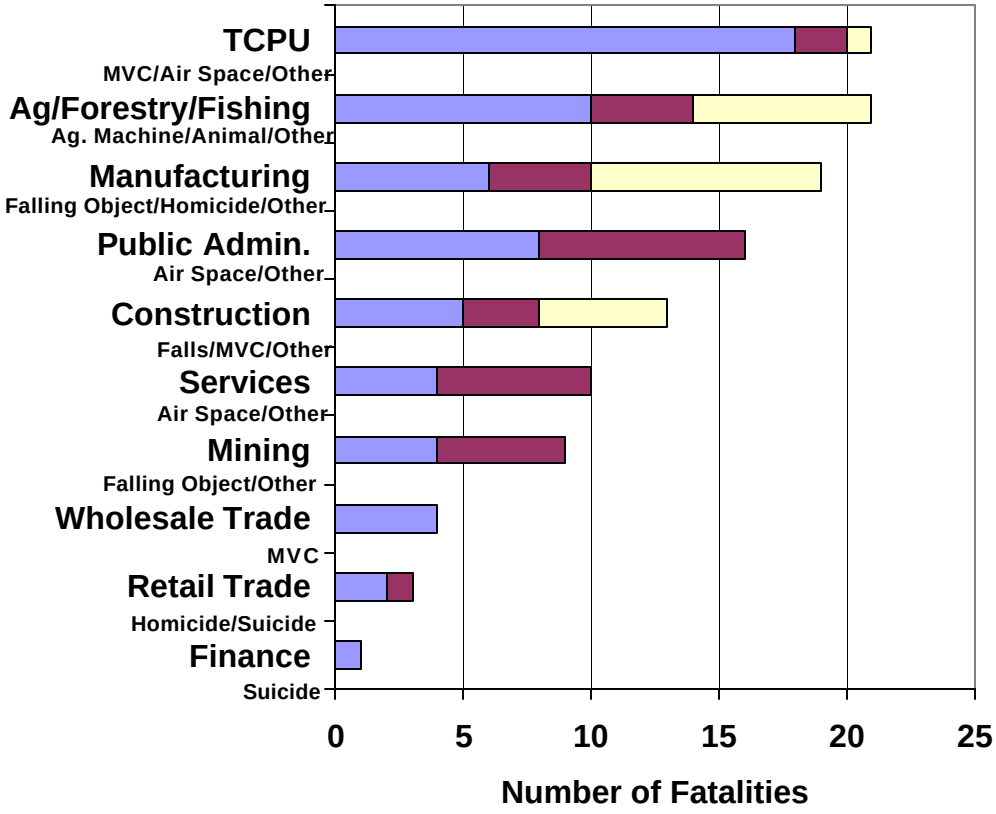
[c]The industries listed do not equal 100 percent of employed persons because of rounding and because they do not include private household workers, and self-employed and unpaid family workers which make up the remainder of employed persons (7 percent).

[d]US Department of Labor, Bureau of Labor Statistics, National Census of Fatal Occupational Injuries (CFOI), 1996.

*Transportation/Communications/Public Utilities

Figure 5 shows the external cause of death for work-related fatalities by industry. Motor vehicle collisions (MVCs) were the leading cause of death overall, and in two divisions, TCPU (Transportation/Communication/ Public Utilities) and Wholesale trade. About 91 percent of the MVCs (all of the known; there were 9% of unknown vehicle type) involved some type of truck. Air space transport was the second most common external cause of death for 1999 and is represented in 4 different industries.

Figure 5. Leading Causes of Death for Industries with the Highest Number of Fatalities, 1999



Occupation

Table 7 presents Kentucky work-related fatalities by occupation, classified using the *Alphabetical Index of Industries and Occupations*. The division of operators/fabricators/laborers accounted for the largest portion (n=38, 33%) of the work-related deaths in the state. Over half of the workers in this division were professional drivers (n=26, 68%); three (8%) were construction workers. The second highest number of deaths occurred in the farming/forestry/fishing division (n=30, 26%). Farming occupations accounted for 70 percent (n=21) of the workers killed in this division; the other nine fatalities were related to logging. Figure 6 shows the leading cause or causes of death for each occupational division.

Table 7. Work-Related Fatalities by Occupation (Rates per 100,000 Workers[a]), 1999

Occupation	Number (%)	KY Rate	US rate[b]
Operators, fabricators, laborers	38 (33)	11	11
Transportation, material moving	26 (22)	25	22
Machine operators, assemblers, Inspectors	3 (3)	2	3
Handlers, equipment cleaners, helpers, laborers	9 (8)	10	13
Farming, forestry, fishing	30 (26)	68*	23
Precision production, craft, repair	19 (16)	9	8
Technical, sales, administrative support	12 (10)	2	2
Military	11(9)	(c)	11
Managerial, professional specialty	5(4)	1	2
Service	2(2)	1	3

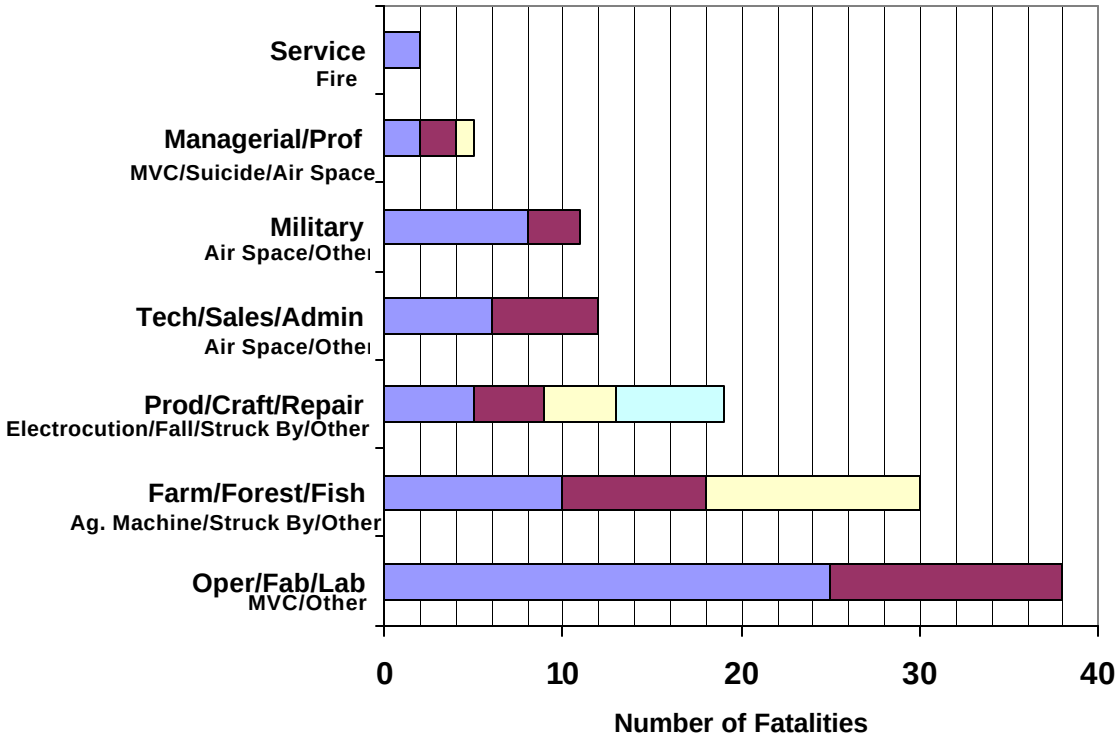
[a] Employment averages obtained from *Geographic Profile of Employment and Unemployment, 1997 (Bulletin 2515).* US Department of Labor, Bureau of Labor Statistics; June 1999.

[b] *Fatal Workplace Injuries in 1995: A collection of data and analysis (report 913)*. US Department of Labor, Bureau of the Census; 1997.

[c] Military population was unavailable. Therefore a rate could not be included.

* The fatality rate for farming, forestry, and fishing *occupations* is high partially because of the undercount of workers in this occupation. A more accurate fatality rate for agricultural workers in Kentucky can be found by using the rate for the agriculture/forestry/fishing *industry.*

Figure 6. Leading cause(s) of death shown for each occupation division



External Cause of Death

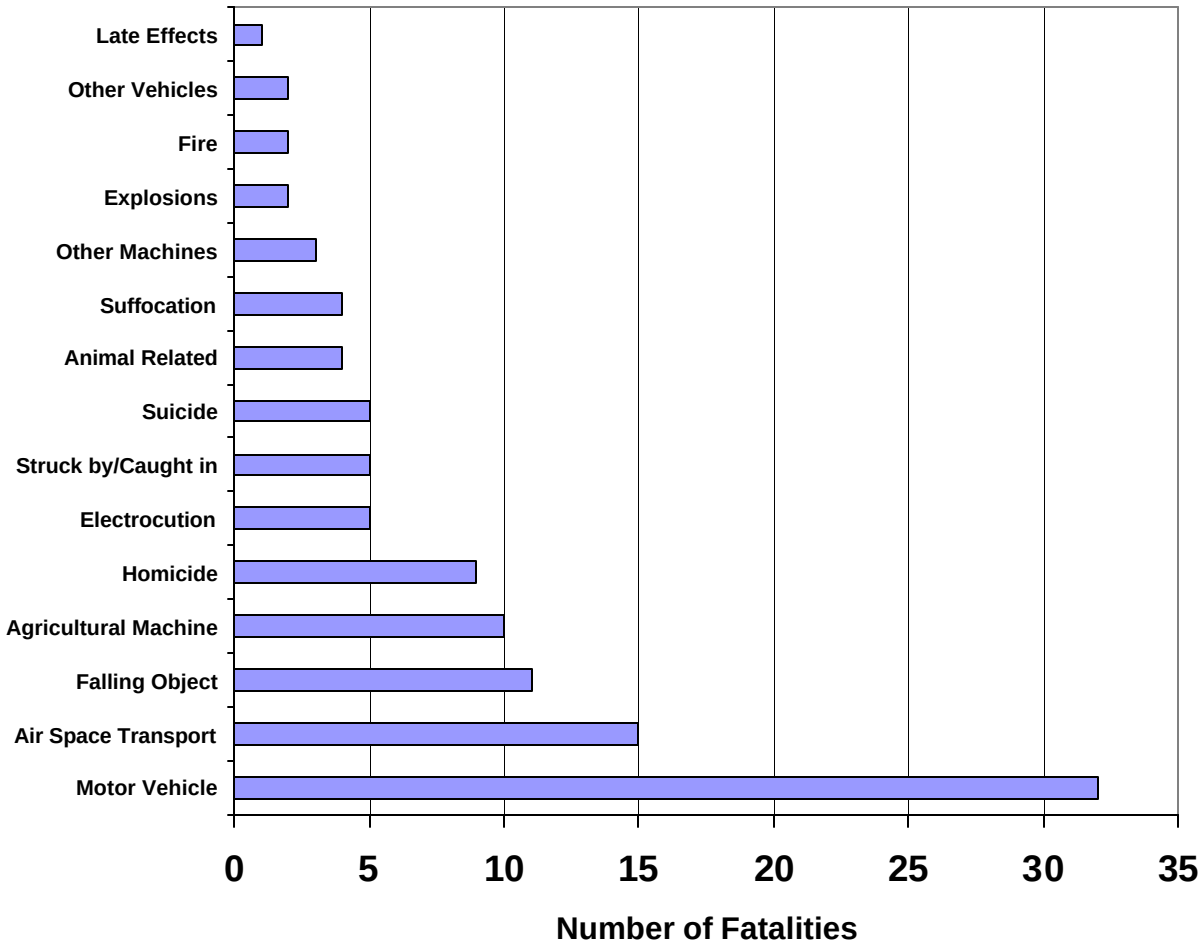
Figure 7 presents work-related fatalities by external cause of death as classified by E-code according to the *International Classification of Diseases, Ninth Revision (ICD-9)*. Again this year, nearly one-third (n=32) of the fatalities were due to motor vehicle traffic incidents.

Perhaps the most shocking increase (1500%) was in the Air Space Transport classification, which was the second most common cause of death (n=15) for 1999. Helicopter crashes were involved in all but two of these fatalities, and eleven fatalities were from just two crashes. One, which claimed seven lives, was a military helicopter that crashed during training. The other was an emergency medical helicopter that crashed while returning to base, killing all four on board. Two other helicopter crashes caused the death of one worker each, and two instructor pilots were also killed in separate plane crashes.

The third most common cause was death due to being struck by falling objects (9%, n=11), such as trees (loggers) and rocks (miners). Nine percent (n=10) of the fatalities were due to agricultural machinery; 3 percent (n=3) were due to other types of machinery. Homicide, again, followed agricultural machinery, accounting for 8 percent (n=9) of the 1999 occupational fatalities.

Also worthy of mention are the four (3%) animal related fatalities, three of which were caused by cattle. One victim was gored by a bull while working at a stockyard, a second charged by a steer as he was attempting to load the animal onto a trailer, and a third was attempting to vaccinate and tag a newborn calf when he was charged by its mother. The fourth fatality involved a horse knocking a worker down onto a hard surface.

Figure 7. Fatalities by External Cause of Death



SPECIAL TOPICS

Agricultural Fatalities

The agricultural industry continues to make up the largest portion of work-related fatalities in Kentucky and therefore merits a closer look at how these workers are being killed. Table 8 describes the 21 workers killed in this industry. Of the 11 deaths due to agricultural machinery in the agricultural industry (down from 12 in FFY 1998), all were related in some way to tractors; some included attachments such as rotary mowers or hay balers. There were four deaths due to tractor overturns (vs. seven in FFY 1998), five due to falling from a tractor and then being run over by it or its attachment, one due to getting caught in an attachment, and one who was struck by a hay ring that he ran over with a tractor. Fifty-seven percent (n=12) of all agricultural-related deaths to farmers were age 60 or over.

Table 8. Agricultural Fatalities, 1999

Characteristic	Number (%)
Total	21(100)
Race/Ethnicity	
White	21 (100)
Sex	
Male	21 (100)
Age	
30-39	1 (5)
40-49	3 (14)
50-59	5 (24)
60-69	5 (24)
70-79	5 (24)
80 and Over	2 (9)
External cause of death	
Agricultural machine	11 (52)
Animal related	4 (19)
Motor vehicle	2 (9)
Falling object	1 (5)
Homicide	1 (5)
Suffocation	1 (5)
Suicide	1 (5)

Examples of fatal agricultural injuries:

- Farmer suffocated after getting caught in corn being pulled into an auger.
- Farmer was unrolling bales of hay when his tractor overturned pinning him underneath.
- Farmer was involved in a collision while driving a grain truck.
- Farmer was vaccinating and tagging a newborn calf when its mother attacked him.
- Farmer was loading cattle onto a trailer when he was charged and run over by a steer.
- Man was knocked down onto a hard surface by a horse and suffered closed head injuries.
- Farmer was caught between the tongue and mower head of a mower conditioner when he released a locking mechanism to prepare the equipment for transport.
- Farmer was driving a tractor when he ran over a hay ring that became caught on the wheel and struck him on the head.
- Farmer was struck in the head by a grinding wheel that detached from its mount.
- A stockyard employee was gored by a bull.
- A farmer was using a tractor to pull up trees when it overturned.
- A farmer was mowing with a tractor and rotary mower on steep terrain when he either fell from or was thrown from the tractor and struck by the mower.

Motor Vehicle Crashes (MVCs)

The leading cause of occupational fatalities in 1999 was again MVCs (n=32, 27%). For this analysis, information was drawn primarily from the Kentucky State Police's Fatal Accident Reporting System (FARS). Of those killed in MVCs, 31 (97%) were male and 1 was female (3%). Table 9 indicates the types of vehicles involved in these 32 MVCs.

Table 9. Types of Vehicles Involved in MVCs, 1999

Vehicle Type	Number	Percent
Truck:	29	91%
Tractor-Trailer	15	47%
Pick-up	3	9%
Straight truck (flatbed, dump, cement)	7	22%
Other (pedestrians hit by trucks)	4	13%
Unknown Vehicle Type	3	9%
Totals	32	100%

The types of safety equipment used, if any, was also analyzed using FARS reports. For this analysis, information was available on all but 3 of the cases. It was found that 53 percent of the victims (n=17) had used no seatbelt or other safety restraint; 25 percent (n=8) had used some combination of seatbelt, harness or airbag. In nine percent of the cases (n=3) this information was unknown, and in the remaining thirteen percent (n=4), safety restraints were not worn because the victims were pedestrians.

Homicides

According to the US Department of Labor, National Census of Fatal Occupational Injuries News Release 98-336 dated August 12, 1998, total work-related homicides for 1997 fell 7 percent below the 1996 total, to the lowest level in the past six years, but remained the second leading cause of work-related death in the US. In Kentucky, work-related homicides increased during that period. For 1999, however, Kentucky saw a decrease in both the number (n=9), and the percentage of total occupational fatalities (8%) due to homicide. This continued the downward trend that began in FFY 1998 (FFY1997, n=17; FFY1998, n=12; 1999, n=9). While the number of homicides had dropped in FFY1998, the percentage of occupational fatalities remained the same as FFY1997 (11%) because of the overall drop in fatalities (FFY1997, n=150; FFY1998, n=107). Figure 8 and Figure 9 depict total number of fatalities per year and occupational homicides as percent of total occupational fatalities.

Figure 8. Occupational Homicides 1995-1999

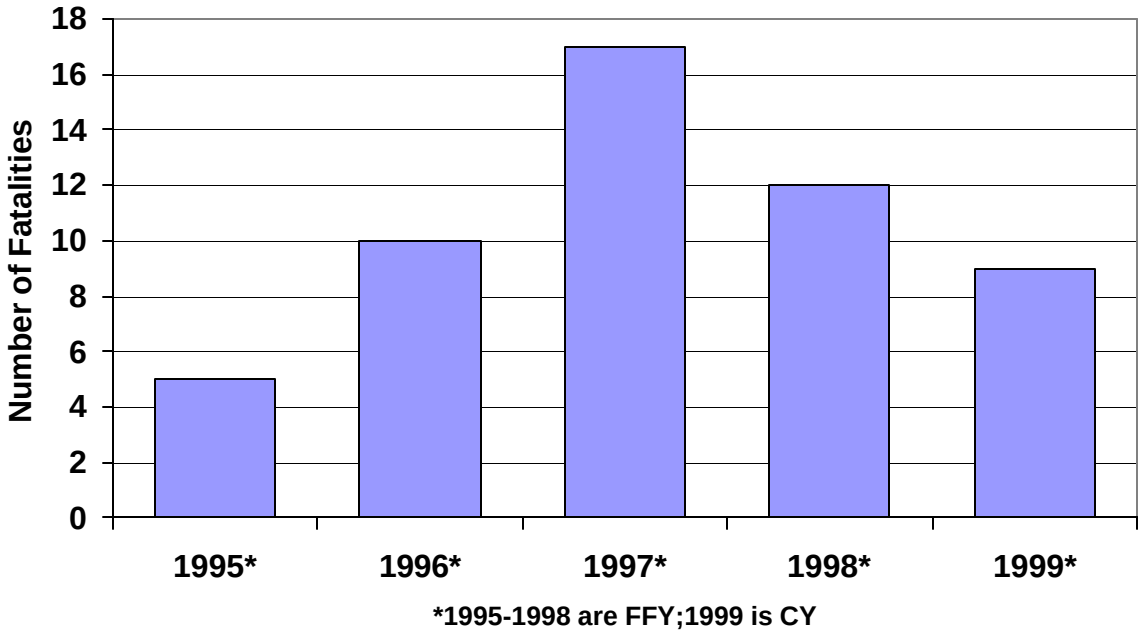
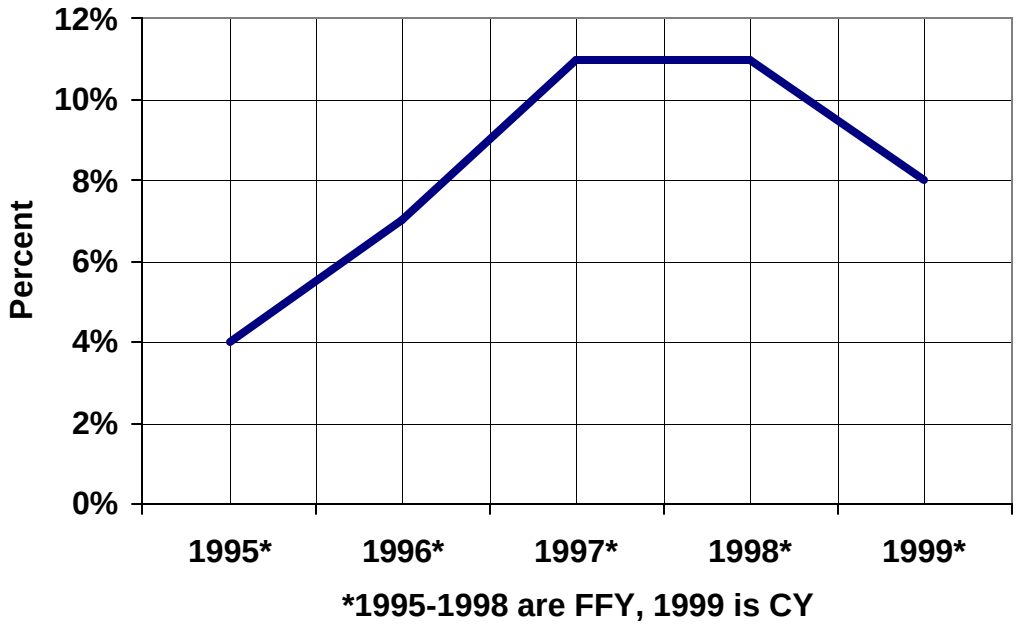


Figure 9. Occupational Homicides as % of Total Occupational Fatalities



Women

Six women were killed on the job during 1999. This is a decrease from FFY 1997 (n=12), and the same as FFY 1998 (n=6). Table 10 describes these six women and how they were fatally injured.

Table 10. Female Occupational Fatalities, 1999

Case	Age/Occupation/External Cause of Death*
1	A 40-year-old attorney aide shot herself in a parking garage.
2	A 55-year-old convenience store clerk was stabbed in the neck during an apparent robbery.
3	A 43-year-old hearing aid technician was assaulted with a handgun.
4	A 43 year old flight nurse was killed in a helicopter crash.
5	A 46-year-old quality control auditor was struck by a utility truck that was backing out of a service road.
6	A 47-year-old claims adjuster shot herself in an office building.

Although women accounted for only five percent of the occupational fatalities, they accounted for 22 percent (n=2) of the 9 homicides. Conversely, homicides accounted for six percent of male occupational fatalities and 33 percent of female occupational fatalities. This statement is at least partly explained by the fact that males tend to work in other dangerous occupations, such as operating heavy equipment, more often than females. However, females remain over represented among occupational homicide victims. Suicide, as well, is over represented by women. In 1999 there were 5 suicides, 2 of which were women. Therefore, 33 percent of female workplace fatalities were suicides, whereas only three percent of male fatalities fell into this category.

Out-of-State Residents

Thirty-one (26%) of the fatal incidents involved residents of 12 other states who died while working in Kentucky. Table 11 provides more detailed information about this group of workers. The highest number of out-of-state residents worked in the TCPU industry division (n=12); all of these workers were truck drivers, except one, who was a helicopter pilot. The most common cause of death was motor vehicle crashes (45%), with air transport ranking second (32%).

Table 11. Occupational Fatalities Involving Non-Kentucky Residents, 1999

Characteristic	Number	(%)
Total Non-KY Residents	31	(100)
Sex		
Male	31	(100)
Industry		
TCPU	12	(39)
Public Administration	10	(32)
Construction	4	(13)
Wholesale/Retail Trade	3	(10)
Agriculture	1	(3)
Manufacturing	1	(3)
Occupation		
Operators/Fabricators/Laborers	14	(45)
Military	10	(32)
Precision Production/Craft/Repair	4	(13)
Farming/Forestry/Fishing	2	(7)
Technical/Sales/Administrative	1	(3)
External Cause of Death		
Motor vehicle	14	(45)
Air Transport	10	(32)
Fall	3	(10)
Other	2	(7)
Struck By/Against	1	(3)
Suffocation	1	(3)

Cost of Fatal Occupational Injury

According to 1992 data, the cost of an occupational fatality, including lifetime lost wages, lifetime lost benefits, workplace costs, lifetime lost household production, medical services, legal and administrative costs, and motor vehicle traffic incidents including property damage, was estimated at $1,073,868 (*Fatal Workplace Injuries in 1993: A Collection of Data and Analysis, Report 891*). Using this figure, the 117 occupational fatalities that occurred in Kentucky during 1999 would represent a total cost of $125,642,556. An estimate of only the lost wages and benefits would exceed $105 million. (Wages and benefits account for 84 percent of the total occupational fatality costs.) These estimates, however, are monetary costs only, and therefore do not reflect the immense intangible costs such as pain and suffering.

The monumental costs associated with occupational fatalities justify the allocation of resources to programs aimed at preventing such events. For example, the expenditure of $1,200 (a high estimate) to retrofit a tractor with a rollover protective structure (ROPS) and seatbelt could save $1,073,868 if the tractor operator was involved in an overturn. During 1999, eight Kentucky farmers died in tractor overturns or other tractor accidents in which a ROPS and a seatbelt would have saved their life. If their tractors had been retrofitted with ROPS and seatbelts, those 12 lives could have been saved, as well as the costs associated with their loss, totaling $8,590,944. Put another way, investing $9,600 for eight ROPS kits could have saved over $8.5 million.

As another example, we know that in one particular Kentucky county, there are 3,052 tractors not equipped with ROPS and seatbelts. Based on the above estimate of $1,200 per tractor, all of them could be retrofitted for a total cost of $3,662,400. Hypothesizing that one of those tractor operators would be involved in a fatal overturn each year, over the next 20 years the costs would total $21,477,360. Retrofitting all those tractors would have saved $17,814,960. Retrofitting older tractors with ROPS and seatbelts has repeatedly been proven effective in saving lives; therefore, prevention resources targeted toward this area will likely reduce the tremendous costs of occupational fatalities in Kentucky.

Years of Potential Life Lost (YPLL)

One hundred and three workers who died in 1999 due to fatal occupational injuries in Kentucky represent a total of 2,570 years of potential life lost (YPLL) based on age 65, as YPLL is usually calculated. There were 12 occupational fatalities with victims over age 65, and two with unknown ages during 1999 who were not included in these calculations.

A paper published by FACE staff in the *Kentucky Medical Association Journal*, September 1998 describes the issue of YPLL in Kentucky. A population-based occupational fatality surveillance system was used to identify 452 work-related fatalities in Kentucky over a three-year period. Three hundred eighty-six workers less than 65 years old were included in this analysis of potentially productive years of life lost (PPYLL). A total of 9,275 years of potentially productive life were lost due to these occupational fatalities, costing the state economy $249 million in lost wages, an average of $83 million per year. Most of this loss (70%) was in the industries of transportation/communication/public utilities, manufacturing, mining and construction. The transportation/communication/public utilities division alone accounted for 21 percent of the total lost earnings. The agriculture/forestry/fishing division exceeded all others in potentially productive years of life lost. However, because of its lower earnings and older ages at death that division ranked 6th in lost earnings. This article demonstrates that prevention resources should be directed at the agriculture, transportation, and logging industries, and to the prevention of fatalities caused by tractors, motor vehicle crashes, and falling objects, to be most effective in reducing the enormous economic burden of occupational fatalities. Table 12 lists the average age at death and average PPYLL by industry division for the years 1994-1996.

Table 12. Average Age at Death and Average PPYLL by Industry Division, 1994-1996

Industry Division	Total Fatalities	Average Age at Death	Average PPYLL
Retail Trade	20	32.5	32.4
Public Admin.	30	34.9	30.1
Mining	36	37.6	27.3
Construction	47	37.9	27.1
Services	26	38.8	26.1
Manufacturing	57	40.9	24.0
Fin./Ins./Real Est.	5	42.0	23.0
TCPU	70	42.9	22.1
Wholesale Trade	8	43.1	21.8
Agri./Forest./Fish.	87	46.8	18.1
Total	386	39.7	25.2

Future directions for Occupational Fatality Surveillance

The next steps for surveillance of occupational fatalities nationwide should include:

- Standardize core variables and coding format (CFOI and FACE)
- Determine if other mortality surveillance systems collecting similar data need to be continued (NTOF)
- Establish Memorandums of Understanding (MOUs) among state and federal agencies participating in fatal occupational injury surveillance regarding data sharing
- Aggregate, interpret, and disseminate data/information on state/regional/national levels to promote prevention actions
- Integrate some occupational questions into field investigations conducted by others who collect data, such as state police doing homicide investigations or traffic safety personnel doing traffic fatality investigations

These are adopted from the draft report "State-Based Surveillance of Work-Related Diseases, Injuries, and Hazards" a report from the NIOSH-States Surveillance Planning Work Group, March 1999.

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Appendix A

----------**Final**--For Administrative Use Only--Limited Distribution--Not for Publication----------

Fatality **A**ssessment and **C**ontrol **E**valuation Project

Public Health

KY FACE #98KY099

12 March 1999

TO: Michael Auslander, DVM, MSPH, Kentucky Department for Public Health, Division of Epidemiology, Surveillance and Investigations Branch

FROM: Amy Scheerer, MSPH, and Tammy Arthur, MS, KY FACE Project Investigators

SUBJECT: Knotted Log Rolls Off Truck and Kills Logger at Sawmill

SUMMARY

A 42-year-old logger (the victim) was killed when he was struck by a log rolling off a loaded truck at a sawmill. At about 6:10 a.m., the victim and the truck driver arrived at the sawmill with a load of logs on the 20-foot flatbed truck. The stack of logs was rounded above the height of the 53-inch standards and secured by only one chain on the middle of the load. When they arrived, the victim got out of the truck and assisted the driver in backing the vehicle into place for unloading. The victim was in view of the driver during that time. When the truck was in place, the driver put the vehicle in neutral, set the brake and then got out to begin unloading. As he walked around the passenger side of the truck he saw the victim lying on the ground with a 13-foot log nearby. Although the incident was unwitnessed, apparently the victim loosened the chain before the endloader with a log grapple was able to secure the logs. It is likely that the load shifted during transport causing a knotted log on top to move into an unstable position and subsequently roll off. Even though the victim suffered severe head injuries, vital signs were detected. EMS personnel were dispatched after receiving the call for help at 6:15 a.m., arriving on the scene at 6:25. The victim was taken to a local hospital, but died that morning. In order to prevent similar cases from occurring, FACE investigators recommend that:

- The height of the stack of logs should not exceed the standards on the truck;
- Sawmill operators should enforce safe unloading procedures such as not releasing binders until a loader is able to secure the load of logs;
- Loggers/truck drivers should ensure that binders/chains sufficiently secure the logs to avoid

movement during transit;

- Sawmill owners should develop and enforce written safety procedures that include policies for unloading log trucks on the premises; and
- Loggers should attend the Master Logger Program to learn safe logging practices.

INTRODUCTION

On December 1, 1998 a county coroner contacted FACE to report the death of a logger earlier that morning. Investigators traveled to the site on December 3. Interviews were conducted with EMS personnel and the manager of the sawmill (also a paramedic for the EMS). Investigators were shown the site where the incident occurred at the sawmill; the log that rolled off the truck remained at the site. The truck was not available for inspection and the driver was not available for interview. A state police officer responded to the scene and he was interviewed via phone at a later time.

The victim had worked with a small operation of 2-4 loggers for about a year and a half. His primary job was to cut the timber and prepare it for transport to the sawmill, but he came with the driver on the day of the incident to gain more experience in the unloading process. The driver, who owned the truck, had been coming to this sawmill for about a year. Although the victim had been logging for some time, his years of experience in this industry is not known.

The sawmill where the incident occurred is one of the larger mills in the area. No written policies are in place at the mill concerning the unloading procedures although it is the usual practice that a loader secures the logs on a truck before the binders/chains are released.

INVESTIGATION

The night before the incident, the logs cut by the logging crew in a nearby timber tract were loaded onto a 2½-3 ton diesel truck with a 20-foot flatbed trailer. All of the logs on the load were poplar and averaged 13-15 inches in diameter and 13 feet in length. The standards on the flatbed truck measured 53 inches high and although the stack was rounded off at the top, the logs were reportedly not stacked exceedingly high above the standards. As was their usual practice, a single chain in the middle of the load secured the logs on the truck.

The sun was just beginning to rise when the victim and the truck driver arrived at the sawmill the next morning about 6:10 a.m. When they arrived, the victim got out of the truck and assisted the driver in backing the vehicle into place for unloading. He was not wearing a hard hat during these procedures. The dirt and gravel yard was relatively level in the unloading area which was about 30 feet from the main entrance of the sawmill. At this time the binder, which maintains the tension on the chain, had not yet been unfastened and the victim was in view of the driver as he motioned him to back up into position. When the truck was in place, the driver put the vehicle in neutral, set the brake and then got out to begin unloading. As the driver walked around the truck, he saw the victim lying on the ground next to the truck bed on the passenger side. A 13-foot log with a diameter of 12-13 inches lay on the ground nearby him. This log had a noticeable knot in the middle which may have caused it to move into an unstable position on top of the load as the logs shifted during transport. Although the incident was unwitnessed, apparently the victim loosened the binder before the endloader driver was able to come

over to secure the logs with the grapple and this unstable log rolled off the top and struck the victim in the head and face.

The sawmill manager, who is also a paramedic, ran over to the scene from the sawmill office. Even though the victim suffered severe head injuries, vital signs were detected. EMS personnel were dispatched after receiving the call for help at 6:15 a.m., arriving on the scene at 6:25. The victim was taken to a local hospital, but died that morning.

CAUSE OF DEATH

Cause of death on the coroner's report was cerebral hemorrhage due to fractured skull due to logging accident.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: The height of the stack of logs should not exceed the standards on the truck. (APA Safety Alert 93-S-46)

Discussion: In this case even though the logs were reportedly not stacked exceedingly high, the topmost logs on the rounded stack were slightly above the standards. Loads that are kept below the standards will ensure that logs cannot roll off during unloading even if the logs have shifted while in transit. In this case a knotted log on top of the stack had become unstable and subsequently rolled off the truck at the sawmill; however, if the load had been below the standards this log would have not been in a hazardous position.

Recommendation #2: Sawmill operators should enforce safe unloading procedures such as not releasing binders until a loader is able to secure the load of logs.

Discussion: Sawmill regulations for log unloading methods state that "binders on logs shall not be released prior to securing with unloading lines or other unloading device [CFR 1910.265 (d)(1)(i)(b)]. Although it was the usual practice at this sawmill to secure the logs with a grapple before the chains are released, in this case the victim apparently released the binder before the endloader was able to come over to the truck. Training should be provided by sawmill operators as well as employers concerning safe unloading procedures. Apparently the victim went with the driver to gain experience in the unloading process and may have needed further instruction on the usual practices at the sawmill and what hazards to be aware of during the process.

Recommendation #3: Loggers/truck drivers should ensure that binders/chains sufficiently secure the logs to avoid movement during transit.

Discussion: Sawmill regulations for lumber hauling trucks state that "...binders shall provide adequate means to secure the load against any movement during transit" [CFR 1910.265 (c)(30)(xii)(b)]. In this case, the logs on the truck trailer were secured with only one chain in the middle of the load which was the normal practice for this logging operation. When the binder that secures the chain was loosened, an unstable log on top of the load rolled off. In this case having another chain on the load may have decreased the shifting of the logs during transport as well as decreased the risk of a log falling off the truck unexpectedly.

Recommendation #4: Sawmill owners should develop and enforce written safety policies that include proper procedures for unloading log trucks on the premises.

Discussion: Enforcing safe procedures and providing proper training would help ensure that log trucks are unloaded properly, providing a safe work environment for loggers, drivers, and the employees of the mill. In this case the victim was not an employee of the sawmill, however loggers and truck drivers who do business with the mill should be expected to follow the established procedures.

Recommendation #5: Loggers should attend the Master Logger Program to learn safe logging practices.

Discussion: Loggers should be aware of proper procedures and safety practices to ensure a safe work environment. The 3-day Master Logger Program covers material concerning logging safety, appropriate personal protective equipment, and best management practices. For information about the Master Logger Program, contact Jeff Stringer at the University of Kentucky Department of Forestry (606/257-5994).

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Appendix B

KENTUCKY INJURY PREVENTION AND RESEARCH CENTER

OCCUPATIONAL INJURY PREVENTION PROGRAM

FACE Project

Report Request Form

Please send copies of FACE investigation reports, as indicated below, to:
Name:_____
Organization:_____
Address:_____
City:_____ State:_____ Zip:_____

Format Desired: Paper_____ Disk (WordPerfect format)_____

Please check each report on the list below that you would like to receive and send this form to: KY FACE Project, 333 Waller Avenue, Suite 202, Lexington KY 40504-2915; or FAX to (859) 257-3909. If you need additional information, please contact Mike Pope at (859) 257-4955, or (within Kentucky) (800) 204-3223.

Fatality Investigation Reports:

_____ 94KY029 Tree Trimmer Dies After 50 Foot Fall While In Bucket Truck
_____ 94KY038 Logger Killed When Struck by Log That Rolled off Truck During Unloading Operation
_____ 94KY040 Tractor Overturn Kills Farmer
_____ 94KY043 Part-time Farmer Dies After Tractor Leaves Public Roadway and Overturns
_____ 94KY044 Part-Time Farmer Drowns In Pond After Tractor Rollover
_____ 94KY045 Part-Time Farmer Dies After Pick-up Truck Overturns
_____ 94KY051 Demolition Foreman Dies After 35 Foot Fall Through Hole in Flat Roof
_____ 94KY059 Farmer Dies After Being Run Over By Tractor While Checking Gas Wells
_____ 94KY063 Farmer Is Run Over By Tractor After Losing Control on a Public Roadway
_____ 94KY078 Farmer is Killed After Being Run Over By Wagon
_____ 94KY084 Part-time Farmer is Killed After Losing Control of His Tractor
_____ 94KY090 Farm Worker is Killed in Tractor Rollover
_____ 94KY091 Part-Time Farmer is Killed in ROPS-Equipped Tractor Rollover
_____ 94KY097 Farm Tractor Overturns Crushing Part-time Farmer
_____ 94KY100 Farmer Killed When Tractor Overturns
_____ 94KY111 Farmer Struck by Truck and Killed on Public Roadway
_____ 94KY115 Farmer Pinned When Tractor Overturns Into Dry Creek Bed
_____ 94KY124 Retiree Killed When Tractor Overturns
_____ 94KY144 Retiree Dies After Tractor Overturns into Creek
_____ 94KY161 Log Loader Runs Over Worker at Stave Mill

_____ 95KY011 Farmer Killed When Run Over by Tractor in Barn
_____ 95KY015 Prison Employee Killed in Tractor Rollover
_____ 95KY017 Retiree/Part-time Farmer Killed When Run Over by Bush Hog
_____ 95KY030 86-Year-Old Farmer is Killed After Being Hit By Tree Branch
_____ 95KY039 Farmer Killed in Tractor Rollover
_____ 95KY043 Farmer Killed After Tractor Overturns Into Creek Bed
_____ 95KY046 Farmer is Run Over by Disc After Falling from Tractor
_____ 95KY047 Retiree Dies in Tractor Rollover
_____ 95KY050 Farmer Run Over After Falling From Tractor
_____ 95KY055 Farmer Crushed in Hay Baler

_____ 95KY068 Welder Crushed by Unmanned Pipelayer
_____ 95KY073 Logger Killed in Endloader Rollover
_____ 95KY078 Logger Killed by Falling Snag
_____ 95KY088 Farm Worker Killed in Tractor Rollover on Public Roadway
_____ 95KY089 Logger Killed in Bulldozer Rollover
_____ 95KY102 Logger Killed When Log Rolls Off Truck at Sawmill
_____ 95KY110 Log Rolls Off Truck During Unloading and Strikes Logger
_____ 95KY122 Farmworker Killed When Caught in Power Take-Off (PTO)
_____ 95KY126 Farmer Dies in Cornpicker

_____ 96KY009 Farmer Strangled by Jacket Caught on Exposed Auger Shaft
_____ 96KY018 Worker Killed in Fall from Oil Tank
_____ 96KY019 Logger Killed by Falling Snag
_____ 96KY028 Welder is Crushed by Rock Chipper
_____ 96KY037 Farmer Killed When Thrown from Tractor
_____ 96KY046 Logs Roll off Truck at Sawmill, Killing Truck Driver
_____ 96KY049 Maintenance Worker Killed in 25-foot Fall from I-Beam
_____ 96KY050 Front End Loader Overturns on Seed/Fertilizer Store Owner
_____ 96KY071 Farmer Killed When Caught in Hay Baler
_____ 96KY073 Farmer Killed When Crushed by Tractor
_____ 96KY077 Mill Owner Dies in Tractor Rollover
_____ 96KY085 Retired Farmer Thrown From and Run Over by Tractor
_____ 96KY088 Farmer Killed in Tractor Rollover
_____ 96KY089 Logger Killed by Falling Snag
_____ 96KY093 Welder Dies after 30-foot Fall from Steel Structure
_____ 96KY102 Logger Killed When Struck by Tree
_____ 96KY105 Hunting Preserve Operator Crushed By Rotary Cutter
_____ 96KY106 Logger Killed in Skidder Rollover
_____ 96KY122 Sawmill Worker Killed by Circular Saw
_____ 96KY125 Pug Mill Operator Killed After Entanglement

_____ 97KY008 Farmer Killed on Tractor During Logging Operations
_____ 97KY016 Farmer Killed When Tractor Turns Over
_____ 97KY018 Logger Killed During Tree Felling
_____ 97KY019 Farmer Killed When Tractor Overturns on Embankment
_____ 97KY028 Farmer Killed When Tractor Slides Over Embankment While Mowing
_____ 97KY029 Rear Tractor Rollover Kills Farmer
_____ 97KY031 Logger Killed when Struck By Tree Limb During Hauling
_____ 97KY032 Bulldozer Operator Killed in Rollover
_____ 97KY044 Tractor/Baler Operator Killed in Entanglement
_____ 97KY071 Professional Roofer Dies in Fall
_____ 97KY073 Logger Crushed During Repair Work on Skidder
_____ 97KY080 Farmer Run Over by Rotary Mower
_____ 97KY093 Farmer Killed in Tractor Rollover
_____ 97KY110 Skidder Operator Thrown from Vehicle During Rollover
_____ 97KY111 Construction Worker Dies in Seven-Foot Fall
_____ 97KY122 Dislodged Tree Strikes Logger

_____ 98KY014 Electrician Dies in 6-foot Fall from Ladder
_____ 98KY018 Farmer Dies When Caught Beneath Overturned Tractor
_____ 98KY024 Farmer Run Over by Tractor
_____ 98KY031 Factory Worker Caught in Overhead Conveyor While Hanging Transformers
_____ 98KY044 Factory Worker Entangled in Conveyor Belt Rollers
_____ 98KY046 Tractor Operator Killed by Rotary Mower while Mowing Highway Right-of-Way
_____ 98KY049 53-year-old Dies in Tricycle Tractor Overturn while Transporting Round Bale

_____ 98KY056 66-year-old Male Dies in Tractor Overturn While Mowing
_____ 98KY063 Logger Fatally Injured by Falling Limb
_____ 98KY072 Farmer Killed When Tractor Punctures Gas Line Causing an Explosion
_____ 98KY077 Tractor Driver Killed in Overturn While Mowing
_____ 98KY099 Knotted Log Rolls Off Truck and Kills Logger at Sawmill
_____ 98KY103 Log Rolls off Truck at Sawmill Killing Employee
_____ 98KY106 Log Rolls off Truck at Sawmill Killing the Truck Driver
_____ 98KY115 Lumber Company Employee Falls 48" From Storage Rack to his Death
_____ 98KY116 Road Construction Worker Killed in Tractor Overturn