Analysis of Toxicology Reports from the 1993-94 Census of Fatal Occupational Injuries

Toxicology reports can give us some insights into fatal occupational injuries. However, lack of uniformity in reporting toxicology results across States limits the usefulness of the data.

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Workers under the influence of drugs or alcohol are a serious concern in the workplace today. Although the magnitude of the substance abuse problem at work is difficult to measure, the goal of maintaining alcohol and drug free workplaces has been addressed repeatedly by industry and government alike.

An informative approach to defining the magnitude of the problem of drug and alcohol use among workers is to evaluate the traumatic deaths that occurred in the workplace and attempt to correlate those deaths with the recent use of drugs or alcohol. To this end, an evaluation of toxicology data for individuals who died as a result of fatal occupational injuries and whose toxicology reports were submitted to the Bureau of Labor Statistics (BLS) for the Census of Fatal Occupational Injuries (CFOI) has been completed for the reporting years 1993 and 1994.

The Census of Fatal Occupational Injuries is the primary source of information on fatal work injuries in the United States. Diverse data sources are used to compile comprehensive information on each occupational fatality, including industry, occupation, type of event, equipment involved, demographic characteristics, and circumstances of the fatal incident. Summary data are issued annually about 8 months after the end of the calendar year.

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Methods

In the fatality census program, participating State agencies attempt to collect comprehensive information on all fatal work injuries. The source documents used to identify and describe occupational fatalities often include toxicology information about the decedent. The toxicology reports provide information on whether alcohol, drugs, and other toxic substances were present in the deceased and, if so, at what levels. A variety of sources provided toxicology results: Police accident reports, medical examiner and coroner reports, autopsy reports, and follow-back questionnaires. In addition to unintentional fatal injuries such as falls and motor vehicle crashes, the study also covered intentional injuries such as suicides and homicides that occurred during the time the victim was at work.

During 1993 and 1994, 6,331 and 6,632 fatal occupational injuries, respectively, were reported nationwide. Thirty-two States gathered toxicology reports for 1,899 fatalities in 1993; 23 states did so for 1,242 fatalities in 1994.

Based on the information available, the majority of the toxicological analyses were performed using specimens that were obtained post-mortem or during resuscitative efforts in

the pre-hospital or emergency department phase of care.

Cases that showed positive results for nicotine and caffeine were excluded from the analysis because neither is generally associated with cognitive or psychomotor impairment. Cases that showed exposures from toxic substances in the work environment, such as carbon monoxide and other noxious gases, also were excluded.

Toxicology data limitations

Toxicology reports were available for approximately one-fourth of the occupational fatalities in the study periods. Some toxicology reports are not available for research because of confidentiality policies in the county or State in which the fatality occurred, or because of pending litigation related to the incident.

Collecting toxicology data and accurately categorizing the effects substance use may have had on fatal occupational injuries is especially challenging to the State agencies that participate in the BLS fatality census. It would be optimal for all States to collect and report this information for all fatal work injuries in a uniform fashion to make region-to-region, State-to-State, and case-to-case comparisons possible. Because drug use patterns may vary by region of the country, industry, or occupation of the workers, the fact that toxicology reports were not available for large numbers of fatalities limits the analysis of substance use patterns. Data from missing reports could significantly change the results of this analysis.

Furthermore, toxicology reports are collected only for deceased workers. Reports are not collected for coworkers, perpetrators of violence, or others whose actions may have contributed to the fatal incident.

In addition to the lack of universal reporting in the study, the lack of uniformity in drug and alcohol testing of decedents affects the ability to draw conclusions about the data. Not all decedents reviewed in this study were tested for all substances: Some were checked only for the presence of alcohol, whereas others were tested for both drugs and alcohol. Some jurisdictions test and report drug presence in urine only, others test and report blood test results only, and others may do both. Still other jurisdictions test and report on other body fluids such as vitreous humor alcohol levels.

Also, it is generally accepted that the toxicokinetics of post-mortem drug and alcohol levels are poorly defined. It is unknown at present what percentage may be due to post-mortem fluid shifts, post-mortem absorption, and even post-mortem putrefaction.

Finally, some of the decedents in the study died immediately as the result of the incident, and others survived the initial event only to die in the hospital later. Of the latter group, some of the drugs reported may be from therapeutic interventions. For example, an individual who is injured in an automobile accident while working and survives several days in the hospital intensive care unit may receive opiate drugs for pain relief or anesthetic purposes. Unless this is well documented in the toxicology reports, these cases could be falsely classified as possible drug abuse involving opiates. Alternatively, such a patient may not have been screened specifically for alcohol or illicit drugs, in which case the toxicology report would miss the presence of these substances. Consequently, the data do not support conclusions about the degree or level of drugs of abuse for some decedents.

Results

Overall, about one-fifth of the toxicology reports submitted showed positive readings for alcohol or one or more drugs. This is about 5 percent of total fatal work injuries. (See table 1.)

Table 2 shows the substances identified in the toxicology reports. Alcohol was the most common substance found in deceased individuals with positive toxicology results. In 1993, 47 percent of the 277 positive toxicology cases indicated the presence of alcohol, compared to 44 percent of the 339 positive toxicology cases in 1994.

Table 3 shows the toxicology results by occupation. Construction trade workers, truckdrivers, and farmers accounted for almost two-thirds of the positive cases.

TABLE 1. **Toxicology reports for workplace deaths, 1993-94**

Toxicology reports	1993	1994
States providing toxicology reports	32	23
Total fatalities	6,331	6,632
Percent of total fatalities involving positive toxicology reports	4.4	5.1
Toxicology reports reviewed	1,899	1,242
Positive toxicology reports	277	339
Percent of reviewed toxicology reports that were positive	14.6	27.3

TABLE 2. **Substances identified in positive toxicology reports for deceased individuals, 1993-94**

Substances identified	1993		1994	
	Number	Percent	Number	Percent
Positive toxicology reports	277	100.0	339	100.0
Alcohol	130	46.9	150	44.2
Opiates	35	12.6	39	11.5
Benzodiazepines	24	8.7	22	6.5
Antihistamines	3	1.1	10	2.9
Cocaine	42	15.2	51	15.0
THC	42	15.2	44	13.0
Amphetamine /Methamphetamine	18	6.5	12	3.5
Barbiturates	6	2.2	16	4.7
Other substances: pcp, benzene, methaqualone, propoxyphene methanol	3	1.1	6	1.8

NOTE: Due to the presence of more than one substance in some of the decedents, components do not equal totals.

TABLE 3. **Percent distribution of positive toxicology reports by occupation, 1993-94**

Occupation	1993	1994
Total fatalities	6,331	6,632
Positive toxicology reports	277	339
Percent	100	100
Construction trade	25	22
Truckdrivers	18	19
Farmers	17	15
Sales	13	10
Mechanics	8	10
Laborers	6	10
Fishers	6	8
Police	5	4
Health care workers	2	2

The following characteristics were also analyzed: Toxicology results by day of the week, month, time of day, employee status, years of employment, gender, age, race, injury type, event, and size of employer. The percent of positive test results by gender closely approximates occupational fatalities by gender. (See table 4.)

Similar patterns resulted for other worker characteristics. For example, the distribution of positive toxicology reports by type of fatal event also follows the pattern of events for all worker fatalities. For both years, motor vehicle incidents, homicides, and falls were the leading events for all fatal work injuries. Likewise, the leading events contributing to job-related fatalities with positive test results for each reporting year were motor vehicle incidents, homicides, and falls. (See table 5.)

Data source

The Bureau's Census of Fatal Occupational Injuries collects data for all fatal work injuries, including self-employed persons, farm workers, and government employees. For a fatality to be included in the census, the decedent must have been employed at the time of the event—that is, working for pay, compensation, or profit; performing a legal work activity; and present at the site of the incident as a requirement of his or her job. Fatalities that occur during a person's commute to or from work are excluded from census counts.

TABLE 4. **Occupational fatalities and number and percent of positive toxicology reports by gender, 1993-94**

Gender	Fatalities		Positive toxicology reports	
	Number	Percent	Number	Percent
1993				
Male	5,842	92	263	95
Female	489	8	14	5
1994				
Male	6,104	92	319	94
Female	528	8	20	6

TABLE 5. **Percent distribution of fatalities and positive toxicology reports by event and exposure, 1993-94**

Event or exposure	1993		1994	
	Fatalities	Positive toxicology reports	Fatalities	Positive toxicology reports
Total	6,331	277	6,632	339
Percent	100	100	100	100
Highway crashes	20	22	20	18
Homicides	17	10	16	12
Falls	10	8	10	6
Electrocutions	5	7	5	5
Struck by vehicle	6	7	6	6
Struck by object	9	6	9	5
Other or unknown	33	40	34	48

To ensure an accurate count of fatal occupational injuries, the program requires that the work relationship for each case be substantiated by two or more independent source documents.

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