between occupational and non-occupational work, but unless supplemental data are collected, it is difficult to differentiate these fatalities. Differentiating fatal work accidents that are both agriculturally and occupationally related from those that are simply work related or that happen to occur on a farm or in a rural area is critical if agriculture, as an occupation, is to be fairly and accurately compared with other occupations.

The supplemental data collected in this study have additional benefits besides helping to more accurately identify agricultural occupational fatalities. This information can also yield information on non-occupational related injury and health problems. The Cooperative Extension, which has responsibility for farm and home safety education, can use this information to guide safety education and injury prevention activities. Yet another benefit is to assist state agencies to appropriately allocate resources for injury prevention.

The agricultural industry's unique workforce and workplace characteristics pose a greater challenge than most other industries for the tracking of its occupational work fatalities. The NTOF system is a good start for enumerating fatal agricultural occupational work cases at the national level and it is replicable for a single industry at the state level. This allows those interested in single industry state level data to conduct follow-up studies such as we have reported. These state studies can be used as a basis for state statistics, and for adjusting particular industry totals at the national level.

This study should be replicated in several states to better quantify errors of both the NTOF system for agriculture, and non-occupational fatal injuries in agriculture.

ACKNOWLEDGMENTS

This project was funded in part by the Pennsylvania Agricultural Experiment Station, Penn State University.

REFERENCES

1. National Safety Council: Accident Facts. Chicago, IL: The Council, 1984.
2. Stout-Wiegan N: Fatal occupational injuries in US industries, 1984: Comparison of two national surveillance systems. Am J Public Health 1988; 78:1215–1217.
3. Kaminski R, Brockert J, Sesito J, Frazier T: Occupational information on death certificates: A survey of state practices. JAMA 1981; 258:349–352.
4. Schumacher M: Comparison of occupation and industry information from death certificates and interviews. Am J Public Health 1986; 76:635–638.
5. Steenland M, Beaumont J: The accuracy of occupation and industry data on death certificates. JOM 1984; 26:288–296.
6. Davis H: The accuracy of industry data from death certificates for workplace homicide victims. Am J Public Health 1988; 78:1579–1581.
7. Fritsch C: Occupational and non-occupational fatalities on US farms. US Department of Agriculture, Economic Research Service, National Economic Analysis Division, Report No. 356. Washington, DC: USDA, 1976.
8. Murphy D: Pennsylvania farm fatalities during 1980–84. University Park, PA: Pennsylvania State University, College of Agriculture, 1986.
9. Purschwitz M, Field W: Opinions and preferences on farm accident data collection and management. Paper No. 88-5521. St. Joseph, MI: Am Soc Agr Eng, 1988.
10. US Office of Management and Budget: Standard Industrial Classification System. Washington, DC: Govt Printing Office, 1972.

Use of OSHA Inspections Data for Fatal Occupational Injury Surveillance in New Jersey

MARTHA STANBURY, MSPH, AND MARCIA GOLDOFT, MD, MPH

Abstract: Occupational Safety and Health Administration (OSHA) computerized inspections data, death certificates, and medical examiner records identified 204 fatal occupational injuries in New Jersey, 1984–85. OSHA computerized data uniquely identified seven cases. They did not identify 35 fatalities under OSHA's jurisdiction, of which 24 were investigated by OSHA but not recorded, four were not considered work-related, and seven were not known to OSHA. Eighty-seven were outside OSHA's jurisdiction; 28 were among the self-employed who are not under the health and safety protection of any governmental agency. (*Am J Public Health* 1990; 80:200–202.)

Introduction

Surveillance data for fatal occupational injuries have been compiled in several states.[1–5] These data systems are based largely on death certificates, but are usually supplemented by one or more sources of data such as workers' compensation reports and medical examiner reports. Each source independently captures some fraction of cases. Another potential source of data for surveillance systems is data from occupational fatality investigations carried out by the Occupational Safety and Health Administration (OSHA). Investigation data are maintained in a computer database, OSHA's Integrated Management Information System (IMIS).

We examined the usefulness and completeness of these OSHA inspection data for New Jersey's fatal occupational injury surveillance system. The objectives were to determine: whether OSHA investigation data identified cases not captured on death certificates or medical examiners' records; and whether OSHA investigation data were available for all work-related deaths within OSHA jurisdiction that were identified from other data sources in the surveillance system.

Methods

Unintentional occupational fatalities were ascertained for calendar years 1984–85. A fatal occupational injury was defined as a death resulting from an unintentional workplace injury. New Jersey cases were identified from the New Jersey computerized death certificate file by a code that indicated unintentional injury at work and from medical examiner records by manually sorting through reports in the state medical examiner's office. Cases from each source were then merged into one computerized file by matching on the name of deceased.

From the New Jersey Department of Health, Division of Occupational and Environmental Health. Address reprint requests to Martha Stanbury, MSPH, Program Manager, Occupational Epidemiology Program, Division of Occupational and Environmental Health, New Jersey State Department of Health, CN360, Trenton, NJ 08625-0360. Dr. Goldoft is Research Scientist, Environmental Health Service. This paper, submitted to the Journal June 5, 1989, was revised and accepted for publication August 3, 1989.

The New Jersey data were compared to OSHA fatality investigation data identified initially from the OSHA IMIS file. The OSHA IMIS file is intended to contain reports of all workplace investigations conducted by OSHA area office inspectors. Name of deceased, name of employer, and other investigative information are included in each record. Names of deceased in the IMIS file were matched with names from the merged death certificate/medical examiner file.

Next, a list of decedents was compiled from cases in the death certificate/medical examiner file for whom a record was not matched in the IMIS file, but whose workplaces appeared to be under OSHA jurisdiction. Jurisdiction was determined by reviewing information about each decedent's workplace available on the death certificate and medical examiner report. Employers in the public sector are not under OSHA jurisdiction. Almost all employers in the private sector are covered by OSHA, except where other federal agencies including the US Department of Transportation and the Federal Aviation Administration have jurisdiction.

The list of decedents' workplaces potentially under OSHA jurisdiction was sent to the OSHA regional office to determine whether these employers were, in fact, under OSHA jurisdiction. If so, the regional office was asked to determine whether an investigation was carried out that was not recorded in the IMIS computer file.

Results

OSHA IMIS data listed 77 fatalities for 1984–85. Sixty-three (82 percent) of these matched with cases in the medical examiner/death certificate file. Four of the remaining 14 cases were cardiovascular deaths and therefore did not meet the case definition. No death certificate could be found for three of the 14. This could have been due to name mispelling or to coding errors in the IMIS file. The remaining seven of the 14 met the case definition and were not captured in the New Jersey data sources (Table 1). Death certificates were obtained for these seven cases; coding errors explained why they had not been captured.

Two-hundred and four fatalities were counted by combining the IMIS data with the death certificate/medical examiner file. Table 2 shows OSHA jurisdiction of the 204 cases. Eighty-seven (43 percent) of the fatalities were outside of OSHA jurisdiction. Of the 105 under OSHA jurisdiction, OSHA IMIS identified 70 (67 percent) cases. Twenty-four investigations were carried out by OSHA area offices but were not recorded in the IMIS system. Of the remaining 11 fatalities under OSHA jurisdiction, OSHA claimed that in four cases the deaths were not work-related because the decedents had preexisting medical conditions (e.g., seizure disorder) related to the fatal episode, and therefore an OSHA investigation was not required. Seven cases of the 105 under OSHA jurisdiction were not investigated because OSHA was unaware of the fatality.

TABLE 1—Occupational Fatalities Identified in OSHA IMIS Data: 1984–85

	Number	%
Matches with death certificate/medical examiner file	63	81
False positives (cardiovascular deaths)	4	5
No death certificate found	3	4
True positives not matching death certificates/medical examiner file	7	9
Total cases in IMIS data file	77	100

TABLE 2—OSHA Jurisdiction for 204 Occupational Fatalities Identified in New Jersey 1984–85

Cases	Number (%)
Not under OSHA Jurisdiction	
Transportation	51
Government	8
Self-employed	28
Total not under OSHA jurisdiction	87 (43)
Under OSHA Jurisdiction	
Investigated according to IMIS data	70
Investigated according to OSHA regional office, not in IMIS	24
Not work related, according to OSHA Regional office	4
Not investigated; OSHA regional office unaware of fatality	7
Total under OSHA jurisdiction	105 (51)
Insufficient Data to Determine OSHA Jurisdiction	12 (6)
Total fatalities	204 (100)

Discussion

This study showed that the OSHA IMIS data file identified occupational deaths identified through no other source, but that it did not serve as a sole source of information because it did not capture all work-related deaths. Because IMIS data capture cases independent of other data sources, these data should be included in state-based fatal occupational injury surveillance systems. In addition, these data could be used as another source to estimate the true magnitude of fatal occupational injuries nationwide, following the procedures of Suruda.[6] However, there are several problems in utilizing these data, including the failure of IMIS data to accurately reflect the numbers of fatality investigations completed by OSHA area offices and underascertainment due to limited OSHA jurisdiction. The national OSHA Office of Data Analysis is addressing the first problem.

In a previous report, with incomplete case follow-up by the OSHA regional office, it appeared that as many as 34 percent of cases with employers apparently under OSHA jurisdiction were not investigated.* Other states using data on employers' fatality reports to OSHA had similar findings.[2,5] After exhaustive examination of case files by the OSHA regional office, it has been determined that a smaller proportion (7 percent) of cases under OSHA jurisdiction were not actually investigated by OSHA. Currently, death certificate and medical examiner data in New Jersey are being shared with the OSHA regional office to ensure that all occupational fatalities within OSHA's jurisdiction are investigated.

These data showed that nearly half of these New Jersey occupational deaths were outside of OSHA jurisdiction, of which 28 were among the self-employed, who are not under the health and safety protection of any governmental agency. Investigative data from OSHA have certain details about the circumstances of fatalities that are not in data from other

*Stanbury MJ, Goldoft M, O'Leary K: Data Sources for a Fatal Occupational Injury Surveillance System in New Jersey. Paper presented at the Annual Conference of the Society for Occupational and Environmental Health, April 6–8, 1987.

sources. Such details, which are important for injury prevention programs, are not available on these cases. Legislative changes are needed to address the large number of occupational deaths not under OSHA's jurisdiction.

ACKNOWLEDGMENTS

Dr. Goldoft compiled the death certificate and medical examiners' data while serving as an Epidemic Intelligence Service officer with the Centers for Disease Control. Opinions expressed in this paper are those of the authors and do not necessarily reflect the views of the Centers for Disease Control. We wish to thank Kathleen O'Leary, Allison Tepper, and Kenneth Rosenman for their helpful review of previous drafts of this paper, and also the staff in OSHA for their cooperation in following up on fatality inspection records.

REFERENCES

1. Karlson T, Baker SP: Fatal occupational injuries associated with motor vehicles. *In* Proceedings of the 22nd Conference of the American Association for Automotive Medicine. Arlington Heights, IL: American Association for Automotive Medicine, 1978; 229–241.
2. Baker SP, Samkoff JS, Fisher RS, Van Buren CB: Fatal occupational injuries. JAMA 1982; 248:692–724.
3. Suarez L, Carroll WD, Barrington WE, Alexander CE: Fatal occupational injuries-Texas, 1982. MMWR 1985; 34:27–30.
4. Parkinson DK, Gauss WF, Perper JA, Elliot SA: Traumatic workplace deaths in Allegheny County, Pennsylvania, 1983 and 1984. Jom 1986; 28:100–102.
5. Colorado Population-based Occupational Injury and Fatality Surveillance System Report 1982–1984, Health Statistics Section. Denver, Colorado Department of Health: 1988.
6. Suruda A, Emmett EA: Counting recognized occupational deaths in the United States. JOM 1988; 30:868–872.

Workplace Health Hazards: Analysis of Hotline Calls Over a Six-Year Period

JULIA QUINT, PHD, MARGARET HANDLEY, BA, AND KATE CUMMINGS, MPH

Abstract: Between 1981–1986 a state-based occupational health telephone hotline received more than 8,000 inquiries on over 3,000 hazardous agents. Major caller groups were employees (37%), employers (20%), health care providers, primarily physicians (19%), government agencies (12%), and labor unions (6%). Employees were the fastest growing caller group. Callers inquired about general health hazards of chemicals (65%), the relation of symptoms to work (22%), and risks to pregnancy (13%). (*Am J Public Health* 1990; 80:202–204.)

Introduction

In 1979, the California legislature enacted a right-to-know law with several support resources including the Hazard Evaluation System and Information Service in the Department of Health Services. As described elsewhere,[1] staff (toxicologists, physicians, industrial hygienists) perform a variety of functions, including operation of a publicly accessible telephone inquiry response system. Over 12,000 inquiries involving a cross-section of California workplaces have been received from 1980 through early 1989.

We present and discuss descriptive statistics which characterize inquiries received from 1981 through 1986.

Methods

Inquiry Intake Procedure

Information in the following categories is obtained from callers and recorded on a standard form after assuring confidentiality. Callers' concerns are grouped into one of three areas: effect on pregnancy; relation of symptoms to work; general health hazard information. Only one concern is recorded as primary; the order of priority (highest to lowest) is pregnancy, symptoms, general information. Callers are categorized as follows:

- *Employees:* persons calling on their own behalf regarding exposures in their workplace, self-employed individuals, and friends and relatives who call on behalf of employees.
- *Employers:* supervisors and managers, company health and safety and medical personnel and industrial hygenists.
- *Health care providers:* physicians, nurses, genetics counselors, poison control center staff and paramedics.
- *Governmental representatives:* California Occupational Safety and Health Administration (OSHA) personnel, city, county, state and federal personnel.
- *Others:* attorneys, news media representatives, volunteer organizations, educational institutions, etc.

Callers' characteristics and primary concerns were tallied from 1981 through 1986. Primary concerns by caller group were tallied from 1986 logs. Data on employee industries, occupations and agents and repeat callers were tallied from the 4th quarter, 1986. Industry data were available for 466 of 562 total inquiries.

Results

During the first four years of full service, there was a modest increase in the annual volume but in 1985 and 1986, the number of inquiries increased by 49 percent and 43 percent, respectively (Figure 1). The average number of inquiries during 1985 and 1986 (2,067) was approximately double the average (1,038) during 1981–84. The sudden increase in inquiry volume appears to be due to increased awareness regarding the potential health effects of chemical exposures at work.

In 1986, of the 365 employer inquiries received, 40 percent were from managers and supervisors, 29 percent were from health and safety personnel (other than industrial hygienists), and 24 percent were from industrial hygienists.

Of the health care providers who called in 1986, 67 percent were physicians (70 percent from private practices). Nurses (12 percent) and genetics counselors (9 percent) were the other major groups who called in 1986.

Approximately one-third of the government agency inquiries in 1986 were from California OSHA. The majority of these callers were industrial hygienists requesting information for worksite inspections.

Analysis of a subset of 1986 callers (562 inquiries received in the fourth quarter of 1986) showed that 39 percent of the employers, 36 percent of the health care providers, 33 percent

Address reprint requests to Kate Cummings, MPH, Hazard Evaluation System and Information Service (HESIS), California Departments of Health Services/Industrial Relations, 2151 Berkeley Way, Berkeley, CA 94704. Dr. Quint is with HESIS; Ms. Cummings and Ms. Handley are with the Health Officers Association of California. This paper, submitted to the Journal December 12, 1988, was revised and accepted for publication July 17, 1989.