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Comparison of agricultural injury and fatality characteristics obtained from media monitoring versus official statistics



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BACKGROUND

Agriculture is one of the most hazardous industries in the United States (1). While occupational fatalities have declined in other industries, no reduction has occurred in agriculture in recent years (1). Agricultural employees also have the highest non-fatal injury rate the United States (2). Common injury hazards include tractors, machinery, ATVs, grain bins, confined spaces, manure pits, livestock, and pesticides (3). Agricultural fatalities and injuries impact families and communities, and this public health problem requires better surveillance in order to create tailored prevention modalities.

Currently, agricultural fatalities and injuries are tracked by the Bureau of Labor Statistics and individual research studies. Often, the data consist of simple counts of incidents in broad categories, such as "tractor incident". A national database, Census of Fatal Occupational Injuries (CFOI), captures occupational fatalities by industry. These data are useful in understanding the magnitude of the problem, but does not give the details needed to create specific prevention efforts tailored to the farming population.

The Central States Center for Agricultural Safety and Health (CS-CASH) at the University of Nebraska Medical Center (UNMC) has created an agricultural injury and fatality database, tracking incidents through media briefs, including electronic Google Alerts and press clippings from printed media. A similar database in Australia has proven useful in examining the incidence of farm injuries and providing quality assurance measures when used with other databases (5).

Agricultural injuries and fatalities are underreported in federal databases, and collecting farm fatality cases from death certificates failed to detect up to 18% of farm fatalities (6, 7). Hence, researchers and safety experts must utilize additional means for collecting information on injuries and fatalities. This research study examined fatality and injury data collected by CS-CASH over a five-year period, focusing on differences in incident characteristics between data collection systems.

METHODS

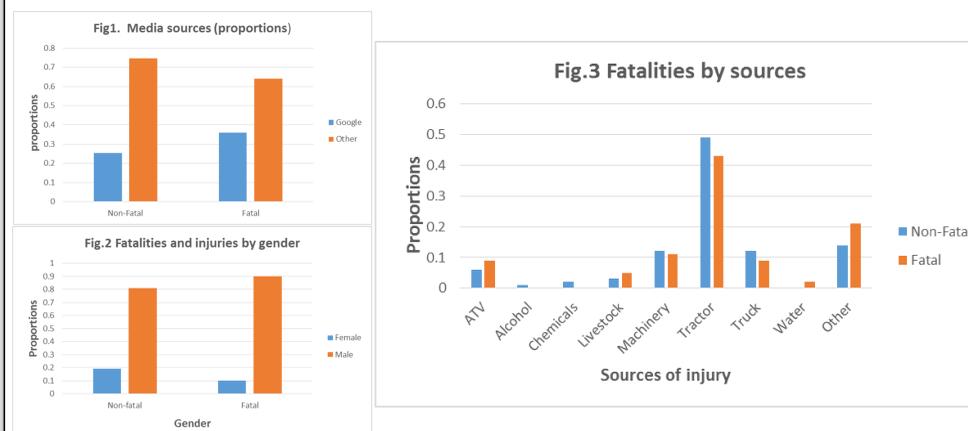
Data Collection

- CS-CASH created a database using Microsoft Access software. Injury data were obtained from electronic and print media sources and entered into the database.
- Google Alerts were collected based on key words including: "farm accident", "farm incident", "farm death", "ranch accident", "ranch incident", "ranch death", "ATV farm death", "ATV ranch death", "livestock death", as well as other descriptors. Articles from Google Alerts were screened. Relevant articles were analyzed, and data were then extracted and added to the database.
- Verifiable electronic and print media reports were collected from agricultural safety and health experts and press clipping services.
- CFOI data were obtained from the Bureau of Labor Statistics.

Data Analysis

- Reported incidents in the United States from 2011 to 2015 were selected for analysis. Data collected by CS-CASH were compared to CFOI data for the same states. Data were analyzed using SAS 9.4. All variables were treated as categorical variables. Two sample Z-test was used to test if there were significant differences between frequency proportions by gender, type of incident (fatal vs. non-fatal), type of injury event, and data collection method (electronic vs. print).

Descriptive statistics of agricultural fatal and non-fatal injuries from CS-CASH Database



Comparison of fatal, non-fatal injuries and CFOI-reported injuries



Table 1: Comparison of fatal injury and non-fatal injury

Factors	Non-Fatal		Fatal		Test	P value
	N	%	N	%		
Media clips	217	0.253	259	0.36	Z	<0.012
Google	640	0.746	463	0.64	Z	<0.0001
Total	857		722			
Gender						
Female	61	0.12	106	0.24	Z	<0.0601
Male	465	0.88	329	0.76	Z	<0.0001
Total	526		435			



Woman killed in farm accident

By The Associated Press Mar 1, 2012 (0)



BRIDGEPORT -- Authorities said a Morrill County woman died in a tractor accident on her family farm in the Nebraska Panhandle.

The sheriff's office said Laurie Gilroy, 48, died of injuries she suffered Thursday morning. Emergency crews were called to a field near the former Nebraska Boys Ranch at about 9 a.m.

DISCUSSION

- The majority of cases captured in the CS-CASH database were non-fatal.
- The majority of cases were obtained from a press clipping service (Fig.1)
- Studies indicate that males are more likely to experience fatal and non-fatal injuries compared to females (9); same was observed in this study (Fig.2)
- Tractors are the number one cause of injury and fatality in production agriculture (8); this was also observed in our findings (Fig.3)
- Print media is more effective than electronic media in reporting non-fatal injuries (Fig. 1).
- Non-fatal incidents reported in the media occur most often off the farm or on roads, while fatal incidents occur most often in the field or pasture (Fig. 3).
- The count of fatalities in the CS-CASH database was about 23% smaller compared to the count reported by CFOI. Inclusion/exclusion of individual cases could not be compared between the systems.
- While CFOI is the 'gold standard' for occupational fatality counts and rates, media reports also capture the majority of fatality cases, and add value by providing more detailed case information that is valuable for prevention.
- In addition to fatalities, electronic and print media reports provide valuable information on non-fatal injuries as well as fatalities. This is an added benefit, creating a rich source of case-based information that can be used in crafting prevention strategies and messages.
- Overall, media reports provide information on injuries to both hired agricultural workers and self-employed farmers and ranchers, which is difficult to get from government sources.

LIMITATION & FUTURE DIRECTION

This report excludes comparison of non-fatal injury data between CS-CASH database and the BLS Survey of Occupational Injuries and Illnesses (SOII). These systems are not comparable as SOII includes hired workers on large farms only. Several organizations collect media monitoring data focusing on different regions, populations, or aspects of agricultural injuries and fatalities. There is a need to explore if a comprehensive national media monitoring system could be beneficial in serving the educational needs of agricultural health and safety experts and producers.

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