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ORIGINAL RESEARCH

News Reports and Their Role in Child Agricultural Injury Prevention

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ABSTRACT

Objectives: The news media can be important sources of health information. News reports of child agricultural injuries were examined to assess what was reported and to evaluate potential implications for health communication and surveillance efforts. **Methods:** A content analysis was conducted of a convenience sample of 113 US news reports from 2012 to 2014 involving agricultural injuries to children less than 18 years of age. The data collection instrument included basic elements of injury surveillance, as well as variables related to injury causation and prevention. **Results:** Law enforcement personnel were the main source of information on the injury event (79%). Severity, age, sex, injury mechanism, and source were reported more than 90% of the time. However, few news reports mentioned use or lack of protective equipment (12%) or a prevention message (6%). Recommended prevention messages from the research team included keeping young children out of the farm worksite (38%) and following guidelines for age-appropriate work and recreational activities (31%). **Conclusions:** This study shows that news reports provide a valuable and relatively inexpensive addition to other childhood agricultural injury data sources. They highlight current serious events and have potential to be an effective communication tool with respect to education, prevention, and framing the public's perception of injury risk. An important next step may be to partner with law enforcement to develop three to five prevention messages that can be shared with reporters to educate readers on risks and steps that can be taken to prevent similar injuries on farms and ranches.

KEYWORDS

Child agricultural injury prevention; child agricultural injury surveillance; law enforcement; news media; risk communication

Introduction

The news media can be important allies for public health. They can alert the general public to new diseases, medical conditions, and injury risks and also promote behaviors to improve health and safety. Healthy People 2020¹ acknowledges the importance of news media as a health communication tool and has two objectives that are particularly relevant to this study: (1) increase risk messages embedded in print news stories that explain how or why an emergency event occurred (HC/HIT 12.3); and (2) increase messages in print news stories that promote steps the reader can take to reduce the health or injury threat (HC/HIT 12.4).¹ As we approach the 2020 target, it would be helpful to assess progress toward meeting these objectives within the field of child agricultural injury prevention.

Public health surveillance is the ongoing and systematic collection, analysis, interpretation, and dissemination of health-related data for the purpose of prevention.² The news media can serve as potential sources of surveillance data for public health problems not routinely collected by state and national data systems. In the United States, there are no comprehensive state or national databases of child agricultural injuries, fatalities, or hospitalizations, and in most cases there are no mandatory reporting requirements for these injuries and fatalities.³ What is known about child agricultural injuries and fatalities comes from periodic injury surveys,⁴ periodic analyses of young worker fatalities,⁵ and infrequent reviews of death certificate data.⁶ In 2015, the National Institute for Occupational Safety and Health (NIOSH), the primary source of these periodic analyses, suspended its surveillance work in agriculture and called for public comments on new

ways of conducting surveillance of agricultural injuries that are smarter and more cost-effective.⁷

Given Healthy People 2020's call to improve health communication¹ and the NIOSH call for new ways of conducting surveillance,⁷ the purpose of this study was to examine news reports of child agricultural injuries to assess what information is reported and to evaluate the potential implications for health communication goals and future surveillance efforts.

Methods

Prior to data collection, the study was approved by the Marshfield Clinic Research Foundation's institutional review board.

News report sample

Agricultural injury news reports from 2012 through 2014 involving children less than 18 years of age were selected from the National Children's Center for Rural and Agricultural Health and Safety (NCCRAHS) news clipping collection. The NCCRAHS collects news reports of agricultural injuries from across the United States. The collection was originally assembled using Google Alerts, a free search engine, to search all digital news media sources for the key words "farm" and "accident." The NCCRAHS felt that searches based on these two key words returned an adequate cross-section of the injury reports of interest while reducing the number of unrelated reports, given the limited functionality of the search engine. The media sources searched included daily and weekly newspapers, magazines, and other periodicals, but social media and blogs were excluded. NCCRAHS staff screened each report identified for relevance and saved those that were truly farm injury reports in an electronic file together with the identifying link. The database collection was supplemented with a small number of news reports not identified in the electronic search but submitted by agricultural safety professionals who were aware of the NCCRAHS effort.⁸

Instrument

A data abstraction form was developed using variables employed in injury surveillance systems. Additional

questions were developed specifically for this study based on our study objectives. The majority of questions required a yes/no response with regard to whether or not the report included information of interest. Space was also provided for comments about the specific details identified in the news report. The 24-item instrument included (1) case demographics; (2) details of the injury event; (3) the reporters' key informant; (4) protective equipment used/not used; (5) inclusion of prevention messages; and (6) the abstractors' recommended prevention message based on the priorities for child agricultural injury prevention framework developed by Pickett et al.⁹

The data abstraction form was validated through iterative testing. First, samples of news reports outside of the study sample years were jointly abstracted by two investigators, and a data abstraction glossary was developed to clarify individual questions and definitions to ensure consistency of responses and to identify consensus decision points. Then, three randomly selected cases from each of the study years (2012–2014) were independently abstracted. Each question was assessed in terms of the percentage of reports where both investigators agreed that the news report did/did not include the information (median agreement 89%). Disagreements were discussed, and they were sufficiently minor that the investigators decided that the final data collection could begin after minor revisions to the data abstraction glossary.

Data collection

One investigator (B.M.) abstracted the final data from the news reports. News reports that were difficult to classify were brought to the research team for discussion and were resolved by consensus. The data abstraction glossary was revised to reflect the consensus decisions.

Data analysis

Standard descriptive statistics were used to summarize important characteristics of the news reports and the injured children. The news reports varied with respect to details provided, and the completeness of the news reports is summarized with respect to elements important to injury surveillance systems.

Results

Full sample

There were 113 news reports of child farm injury from 2012 to 2014 in the NCCRAHS database collection. Seven involved more than one injured child, including one case of fungicide drift involving 79 teens. All geographic regions of the United States were represented, with the majority of news reports coming from the Midwest (74 reports, 65%), followed by the Northeast (19, 17%), South (15, 13%), and West (5, 4%).

Completeness of news reports

In the majority of news reports (89 reports, 79%), the injury incident information was provided by law enforcement personnel. Coroners were a distant second (10, 9%) in terms of providing incident information. Table 1 shows the completeness of the news reports in terms of basic elements of surveillance, as well as variables related to injury causation and prevention. Severity of injury (fatal or hospitalized) was reported for all injury cases. Over 95% of news reports documented age (110, 97%) and sex (109, 96%) of the child, along with the source (110, 97%) and mechanism of injury (108, 96%). Few included a prevention message (7, 6%) or mentioned use or lack of protective equipment (13, 12%).

Description of child injury cases

There were 116 injury cases that had age, sex, and severity specified within the 113 news reports. As shown in Table 2, the injured children were often younger than 7 years (39 cases, 34%), most often male (91, 78%), and not working at the time of the

Table 1. Completeness of news reports ($N = 113$).

Item	<i>n</i>	%
Severity (fatal/hospitalized)	113	100
Age of child	110	97.3
Source of injury	110	97.3
Sex of the child	109	96.5
Mechanism of injury	108	95.6
Time of day	90	79.6
Description of activity	87	77.0
Location on farm	45	39.8
Protective equipment	13	11.5
Prevention message	7	6.2

Table 2. Description of child injury cases.

Descriptor	<i>n</i>	%
Age (years)*		
<7	39	33.6
7–9	23	19.8
10–13	25	21.6
14–17	29	25.0
Sex*		
Male	91	78.4
Female	25	21.6
Severity*		
Fatal	73	62.9
Hospitalized	43	37.1
Work status ⁺		
Working	27	23.9
Not working	86	76.1

*116 Injury cases with age, sex, severity specified. ⁺113 News reports.

injury (86, 76%). The majority of injuries were fatal (73, 63%).

Mechanism and source of injury

Table 3 shows mechanism of injury by age group. Runovers accounted for nearly half (18/38 cases, 47%) of all injuries in the less than 7 years age group and were an important mechanism of injury across all age groups. Rollovers were also a common mechanism of injury. Table 4 shows the source of injury by age group. Tractors were the most common source of injury across all age groups, and all-terrain vehicles (ATVs) were the leading source of injury for the 7–9 (7/21, 33%) and 10–13 (7/25, 28%) age groups. Skid steers were a notable source of injury for those less than 7 years of age (8/38, 21%).

Discussion

Synopsis of main findings

Child agricultural injury news reports in the NCCRAHS database collection from 2012 to 2014 were reviewed. Law enforcement personnel were the main source of information about the injury incident. Prevention messages or use of protective equipment were rarely reported. Young children, males, and nonworking children constituted high percentages of injuries and fatalities reported. Tractors, ATVs, and skid steers were major sources of injury.

Table 3. Mechanism of injury by case age.

Injury	Age group (years)								Overall by mechanism	
	<7 (n = 38)		7–9 (n = 20)		10–13 (n = 25)		14–17 (n = 25)			
	n	% by age	n	% by age	n	% by age	n	% by age	n	%
Runover	18	47.4	5	25.0	7	28.0	5	20.0	35	32.4
Rollover	3	7.9	6	30.0	6	24.0	5	20.0	20	18.5
Collision	0	0	0	0	3	12.0	7	28.0	10	9.3
Entanglement	4	10.5	2	10.0	1	4.0	3	12.0	10	9.3
Pinned	5	13.2	0	0	2	8.0	1	4.0	8	7.4
Suffocation	2	5.3	4	20.0	1	4.0	1	4.0	8	7.4
Other*	6	15.8	3	15.0	5	20.0	3	12.0	17	15.7

*For example, trampled, struck by object.

Table 4. Source of injury by case age.

Injury	Age group (years)								Overall by source	
	<7 (n = 38)		7–9 (n = 21)		10–13 (n = 25)		14–17 (n = 26)			
	n	% by age	n	% by age	n	% by age	n	% by age	n	%
Tractor	15	39.5	5	23.8	5	20.0	9	34.6	34	30.9
ATV	1	2.6	7	33.3	7	28.0	4	15.4	19	17.3
Skid steer	8	21.1	1	4.8	1	4.0	4	15.4	14	12.7
Other farm machinery	3	7.9	1	4.8	3	12.0	5	19.2	12	10.9
Animal	3	7.9	0	0	1	4.0	1	3.8	5	4.5
Grain	1	2.6	3	14.3	1	4.0	0	0	5	4.5
Other*	7	18.4	4	19.0	7	28.0	3	11.5	21	19.1

*For example, metal gate, roof beam.

Recommended prevention messages for child injury cases

Prevention messages were sparse within the news reports and were general in nature (e.g., “be extremely careful around farm equipment”; “stay alert and pay attention”). Prevention messages that could have been used within the news reports for the child injury cases are listed in Table 5. The two most common prevention messages recommended by the research team

centered on developmentally appropriate exposure to the farm worksite and included (1) keeping young children out of the farm worksite (43/113 reports, 38%) and (2) following guidelines for age-appropriate work and recreational activities (35/113, 31%). A prevention message could not be identified for nearly 20% (21/113) of cases (Other), mainly because the injury event descriptions in the news reports lacked detail.

Table 5. Recommended prevention messages for child injury reports (N = 113).

Message	n*	%*
Keep young children out of the farm worksite	43	38.1
Follow guidelines for age-appropriate work and recreational activities	35	31.0
No extra riders on tractors	17	15.0
Require proper protective equipment	14	12.4
Install physical barriers around hazards and fencing to promote safe play areas	8	7.1
No riders in loader buckets	7	6.2
Institute safe storage practices	3	2.7
Properly guard/shield equipment	2	1.8
Other	21	18.6

*Each news report (N = 113) could have more than one recommended prevention strategy.

Healthy People 2020 and health communication

Our review of the news reports showed that news stories of child agricultural injuries, in most cases, reported “how” the injury incident occurred; that is, the source and mechanism of injury were documented. “Why” the injury incident occurred was left to the interpretation of the reader, mainly because prevention messages were not included in the majority of news reports to inform the reader about the “why.”

Previous studies examining protective/preventive messages in general injury news reports have shown mixed results. One study looking at fatal injuries to children from fire and drowning found that news reports were more likely to report protective factors such as smoke detector use, pool fencing, and supervision of children, than were official state records.¹⁰ Another study around the same time period found that protective measures such as seat belts, bicycle helmets, and smoke detectors were seldom reported.¹¹

In a study of news reports specific to agricultural injuries and fatalities, Canadian researchers found that 24% included prevention messages, and only 10% of those messages were considered strong messages.¹² Child-related agricultural injury news reports were more likely to include a prevention message than were adult injury news reports, and urban newspapers were 2 times more likely to have a prevention message within a news story of an agricultural injury or fatality than were rural newspapers.¹²

How can we improve the reporting of prevention messages that can promote steps the reader can take to reduce the risk of injury? Our past experience with news reporters suggests that many would be willing to assist in prevention efforts, provided they have the necessary information. In our study, law enforcement personnel were the key informants about child agricultural injury and fatality events. These law enforcement officials are generally not trained in agricultural safety and do not know best practices related to children and the agricultural worksite. Since reporters are dependent on law enforcement to get the story, an important next step may be to partner with law enforcement officials to develop three to five messages they can share with reporters that may raise consciousness, enhance perceptions of risk, and move

the readers to take steps to prevent similar injuries on their farms and ranches. Because both law enforcement officials and reporters may be hesitant to provide information that may be perceived as lacking sensitivity to traditional farm culture and values, the messages will need to be carefully constructed in specifying risks to children in the agricultural worksite. This has been accomplished in news stories of injuries in motor vehicle crashes, where notation of human and vehicle factors such as seat belt use, air bag deployment, and alcohol use have become more routinely reported. The coupling of a well-constructed message with a real and current injury account in a news report may prove to be an effective combination for prevention.

Child agricultural injury surveillance

A role for news reports in agricultural injury surveillance has been identified previously. An early study looking at all agricultural fatalities during a 5-year period in Minnesota found that there were discrepancies between what was reported on death certificates and what was reported in the newspapers; but if only death certificates had been used, 18% of agricultural fatalities would have been missed.¹³ In a more recent study of Midwest agricultural fatalities, researchers found that some states had a higher number of deaths reported by news reports than by the Census of Fatal Occupational Injury.¹⁴ Thus, news reports can potentially fill gaps in other data sources, at least for agricultural fatalities.

Can news reports play a role in child agricultural injury surveillance? A comparison of our findings from news reports with previous surveillance work involving child agricultural injuries shows results that are strikingly similar in several respects. Children younger than 7 years have the highest rates of fatal and hospitalized injury.^{15,16} Male children experience the majority of trauma.^{5,6,15,17} Most children are not working when they are injured in the agricultural worksite.^{6,15,17} The Midwest region of the United States consistently has higher numbers of child agricultural injuries and fatalities.^{5,17} Vehicles and machinery are the leading sources of injuries,^{5,6} and based on these sources, the

leading mechanisms of injury are runovers of bystanders and passengers and rollovers.⁹

One important discrepancy we identified between news reports and previous child agricultural injury surveillance is the poor capture of child drowning events. Drowning is one of the leading causes of child agricultural fatalities,⁶ particularly for children younger than 7 years.¹⁶ This poor capture of drownings in news reports has been previously been identified. Researchers in Washington State linked news reports of drowning to state death and hospital records and found that 50% of the fatal drownings and 75% of the hospitalized drowning events were not identified in news reports.¹⁸ Another caveat is that news reports of child agricultural injury represent only the most serious trauma (61% fatal, 39% hospitalized), presumably because they are the most newsworthy. This may explain the relatively low prevalence of animals as the source of injury (4.5%), since these are often less severe. According to the Canadian Agricultural Injury Surveillance Project (a national surveillance system), there are approximately 11 hospitalizations for every agricultural fatality¹⁹ and even greater numbers of injuries not resulting in hospital admission. Although it is important to recognize this severity bias, serious injuries are, in fact, the ones we most want to prevent, and news reports may provide important information about these critical events.

Strengths and limitations

A strength of this study is that it was based on reviews of a large collection of news reports, which was broadly based geographically and included a recent, multiyear time period. The study is timely in light of recent calls to improve risk communication and surveillance from Healthy People 2020 and NIOSH. In addition, the reviews were conducted systematically, according to a well-developed research protocol.

The primary limitation of this study is that it was, by necessity, based on a convenience sample. Although systematic, the collection of news reports undoubtedly missed some events. Although many news outlets have developed Internet sites in recent years, it may be that smaller, rural outlets have been slower to produce

digital media, and this may introduce some bias in the available electronic reports, at least for a period of time. In addition, it is likely that even the injuries reported and reviewed more often include serious, “newsworthy” events. As such, the news reports available for review may well differ in some respects from the full population of injury events that may be of interest.

Conclusion

News reports provide a valuable and relatively inexpensive addition to other data sources of information on childhood agricultural injuries. In particular, news reports highlight current, serious events and present a potentially effective communication tool with respect to education, prevention, and the public perception of risk.

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