RESEARCH ARTICLE

WILEY

AMERICAN JOURNAL OF INDUSTRIAL MEDICINE

Establishing a publicly available national database of US news articles reporting agriculture-related injuries and fatalities

Bryan Weichelt PhD, MBA (iD) | **Marsha Salzwedel MS** | **Scott Heiberger BS** |
Barbara C. Lee RN, PhD

National Farm Medicine Center, Marshfield Clinic Research Institute, Marshfield, Wisconsin

Correspondence
Bryan Weichelt, PhD, MBA, National Farm Medicine Center-ML1, 1000 N. Oak Avenue, Marshfield, WI 54449.
Email: weichelt.bryan@mcrf.mfldclin.edu

Background: The AgInjuryNews system and dataset are a news report repository and information source for agricultural safety professionals, policymakers, journalists, and law enforcement officials.

Methods: AgInjuryNews was designed as a primary storage and retrieval system that allows users to: identify agricultural injury/fatality events; identify injury agents and emerging issues; provide safety messages for media in anticipation of trends; and raise awareness and knowledge of agricultural injuries and prevention strategies. Data are primarily collected through Google Alerts and a digital media subscription service. Articles are screened, reviewed, coded, and entered into the system.

Results: As of January 1, 2018, the system contained 3028 unique incidents. Of those, 650 involved youth, and 1807 were fatalities. The system also had registered 329 users from 39 countries.

Conclusions: AgInjuryNews combines injury reports into one dataset and may be the most current and comprehensive publicly available collection of news reports on agricultural injuries and deaths.

KEYWORDS
AgInjuryNews, agriculture, database, farm, fatalities, injuries, media, news clipping, news report, safety, trauma

1 | INTRODUCTION

Farmers and ranchers, their families, employees, and on-farm visitors face a variety of health and safety risks that are unique to agricultural operations. United States agriculture has the highest rate of fatalities across all occupations at 22.8 per 100 000 workers.[1] Yet, reporting requirements for injuries and fatalities within the industry lag behind others, limiting formal datasets at a national level, particularly among

youth. It is estimated that about 33 youth are injured in agriculture-related incidents every day, and approximately every 3 days, a youth dies in an agriculture-related incident.[2,3] While the National Institute for Occupational Safety and Health (NIOSH) periodically collected non-fatal youth agricultural injury data from 1998 to 2014, this surveillance system was discontinued in 2015 due to budget and resource restrictions. In the absence of a central database on youth agricultural injuries (fatal and non-fatal), researchers and safety professionals face a significant challenge when predicting and reporting agricultural injury and fatality data among youth. The same situation holds true for adult injuries and fatalities.

There are few mandatory reporting requirements in the United States for agricultural injuries and fatalities,[4] and what is known comes primarily from periodic reviews of different data sources (eg, police blotters, death certificates, surveys).[5] Moreover, due to variations in classifying and reporting injuries to governmental agencies and challenges in enumerating the number of workers, it is not possible to accurately calculate the rate of agricultural-related injuries and fatalities.[6] The disjointed nature of the data and the variation in taxonomy makes mapping and combining multiple sources costly and challenging.

In response to these data collection challenges, the team at the National Children's Center for Rural and Agricultural Health and Safety (NCCRAHS) began developing the AgInjuryNews system (www.AgInjuryNews.org) in early 2015 (see Figure 1). An initial goal was to develop a web-based system with a database containing information and hyperlinks to public news reports related to agricultural injuries/fatalities sustained by youth under age 18. In 2016, the system was expanded to include injury and fatality victims 18 years and older as well, hoping to increase interest and usage by safety and health stakeholders and agriculturalists alike. This paper describes the core components of the AgInjuryNews system and potential applications for the future.

According to a 2013 survey, newspaper and magazine articles continue to be the most popular source for Iowa farmers when seeking health and safety information.[7] In a published literature review, Evans and Heiberger found that little research had been done with commercial agricultural media outlets in farm safety messaging.[8] They identified a significant gap in the literature and highlighted a number of potential future projects, such as content analyses to provide insight on safety coverage within US agricultural media.[8] In

FIGURE 1 Screenshot of the AgInjuryNews system. [Color figure can be viewed at wileyonlinelibrary.com]

response to these gaps, the NCCRAHS team continued enhancing the AgInjuryNews System, anticipating that the use of this system could improve news media coverage of agricultural-related incidents and encourage the dissemination of prevention messages by media representatives.

2 | COMPONENTS OF A NATIONAL Ag INJURY REPORT DATA SOURCE

2.1 | Assessing existing databases

Initial web searches, literature review, and discussions with colleagues uncovered no publicly available systems for comprehensive agricultural injury news report data. The NCCRAHS had been collecting and storing paper clippings of news reports for more than 20 years, although not in a systematic manner. Additionally, the Southwest Center for Agricultural Health, Injury Prevention, and Education,[9] the Departments of Agricultural and Biological Engineering at Purdue University,[10] Penn State University (D. Murphy, personal communication, March 2017), the Canadian Agricultural Safety Association (CASA),[11] and a team at the Central States Center for Agricultural Safety and Health (R. Rautianinen, personal communication, April 2017) are currently maintaining or building datasets of news reports for their specific regions, some of which date back to the 1980s. Staff from these organizations have been providing guidance and contributing information to AgInjuryNews since its inception, and their experience and lessons learned have played a key role in the evolution of the AgInjuryNews system.

3 | METHODS

3.1 | The team and national steering committee

In January 2015, a team was formed to develop a web-based tool for storing and retrieving agricultural injury and fatality data extracted from print and digital news reports. Core team members included a communications specialist/journalist, a youth agricultural safety specialist, a youth agricultural injury prevention scientist, an agricultural injury informatics scientist, and several information technology experts from the Biomedical Informatics Research Center of the Marshfield Clinic Research Institute. These team members provided initial guidance on taxonomy, classification, data collection, inclusion/exclusion criteria, and entry protocols.

In 2017, a cross-sector National Steering Committee (NSC) was convened with 15 members from 12 states, and Canada, which has agricultural safety and surveillance programs similar to those in the US Committee members include surveillance researchers, agricultural insurance representatives, communications specialists, information technologists, government data analysts, and agricultural safety trainers. The NSC was tasked with providing guidance on inclusion/exclusion criteria, data variables, national and international surveillance gaps and opportunities, visual design, usability and technology options, future uses and audiences, and long-term strategies for research, innovation, and sustainability. The NSC continues to provide input and guidance through teleconference calls, working groups, and as individual members.

3.2 | Fluid, growing dataset

The team attempts to include any and all agricultural-related incidents identified. However, it soon became obvious that some of the system's dataset would be fluid and continually updated as new articles are published and as reports surface from previous years. For example, the 2015 data might be different in 2017 as more articles are added to the 2015 set in later years. The ability to add and adjust the dataset provides users with up-to-date information via the website. However, the data fluctuation in the dataset presents challenges as well; for example, publishing static data in the form of an annual report. At the time of this writing, the format, layout, and content of AgInjuryNews.org annual reports are still being refined.

3.3 | Development of the system

The AgInjuryNews system consists of a backend database and a mobile-responsive web-based user interface (website). Since many people are accustomed to digital tools and online shopping, a similar design was developed to emulate that familiar interactive experience. The site allows registered users to search and filter incident data by selecting filter boxes or using a keyword search. The use of structured data and filters allow users to quickly conduct a detailed, multi-variable search such as, "In the states of Kentucky and New York, how many youth deaths were attributed to tractors and ATVs (all-terrain vehicles) in 2016?"

Realizing that news articles are often biased towards fatalities and traumatic incidents,[12,13] article text that provides details about the circumstances was also included as a searchable element of the database, accompanied by a hyperlink to the original source. The text is crawled during the search to aid a user in locating an injury report, but full-text is not redistributed through the AgInjuryNews.org system. A hyperlink to the original source is always available, though some may expire over time. In the event that a web page link is broken (no longer active or moved) users may "Google search" keywords from the title, which will very often find the article if the media outlet had moved it to an archived location.

These data can help users better understand the parameters that led to the event and plan interventions to prevent these incidents from reoccurring. In addition to article text, the data entry team categorizes and enters the following form field variables and dichotomous responses for each news report:

- Headline
- Incident date
- Incident time
- Author/reporter
- Incident state
- Incident city/county/township
- Incident location
- Was grain involved? Y/N
- Was there an extra rider? Y/N
- Farm type
- Injury agent
- Multiple victims

- Article source
- Source name
- Source URL
- Publication date
- Number of victims
- Victim age
- Victim name
- Gender
- Working/not working
- Fatal/non-fatal
- Victim demographic

Reports are also entered into the database if they contain follow-up information pertaining to the original incident. For example, if an incident later resulted in a lawsuit or if the victim died as a result of his/her injuries, these follow-up reports are entered into the database and linked to the primary article. The ability to add supplemental follow-up reports is crucial to maintaining this type of fluid and up-to-date dataset.

3.4 | Technical details

In 2015, the system was created with ASP.NET (Microsoft 2017), MVC (Model View Controller), and C# programing languages. All webpages, database, and linked articles are hosted and stored using the Microsoft Azure suite of programs (Microsoft Azure, Microsoft Azure SQL Server, and Microsoft Azure Blob Storage) and is managed via the open-source Orchard content management system (CMS).

AgInjuryNews was developed as an Orchard Module, and the theming of the site was created as an Orchard Theme. To port the current website to additional sites, all new sites need to be running a website with Orchard CMS. Since this website is devised as a series of modules, it can be easily installed and enabled on an Orchard website. Orchard supports the following databases: SQL Server Compact, SQL Server, SQL Express database, and MySql (http://docs.orchardproject.net/Documentation/Installing-Orchard).

3.5 | Data collection and entry

News articles from various sources are manually collected, collated, and entered into an electronic database organized by key word/search terms related to agriculture and agricultural injury. Quantitative and circumstantial information from these articles are also manually entered into the database. As the project evolved, and additional uses of the data became apparent, the system was expanded to include other types of injury reports. For example, key terms from commercial fishing and forestry sectors were added to search criteria and have subsequently been added to the dataset.

News articles are acquired from multiple sources including through a paid Meltwater subscription, Google Alerts, and submissions from colleagues around the nation and abroad. News reports have been collected sporadically since the mid-1990s by the NCCRAHS in Marshfield, Wisconsin, but were not consistently collected until January 2015 when a clippings service subscription was purchased through Meltwater, and internal resources were assigned to the project for data collection and entry. In January 2015, team members established four Google Alerts to monitor online media content. In addition to monitoring news content by electronic methods, external colleagues also periodically submit articles to the team.

All articles are reviewed by the data entry team prior to entry into the database to ensure each article meets the established criteria for agricultural-related news reports. These criteria use the US Department of Labor's description of agriculture as its core,[14] with a series of logarithmic yes-no steps to decide inclusion or exclusion from the system. Outliers are reviewed and discussed, excluded articles are discarded, and the standard operating procedure (SOP) is updated as needed (see Figure 2). Search criteria are periodically expanded/added to reflect merging technology adoption and evolving practices within agriculture, fishing, and forestry.

4 | RESULTS

As of January 1, 2018, the system contained 3028 unique incidents. Of those, 650 involved youth, and 1807 were fatalities. More articles are added weekly. The current dataset contains only US articles, yet attracts an international audience.
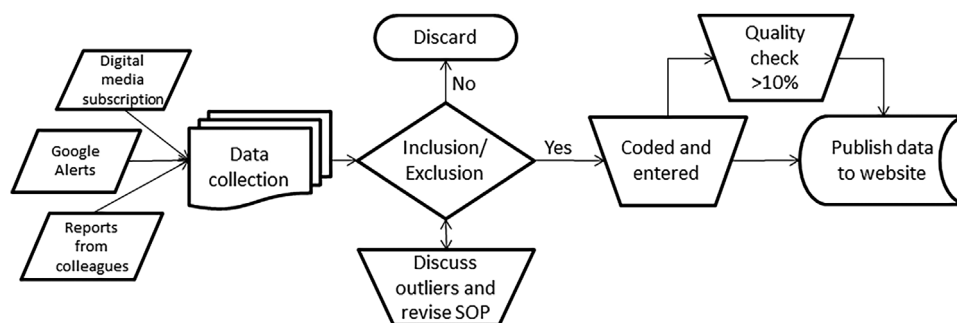

FIGURE 2 Data collection flowchart

The number of registered users continue to grow with each presentation of the system, including 2015, 2016, and 2017 oral presentations at the International Society of Agricultural Safety and Health (ISASH), and updates at the annual meetings of the Childhood Agricultural Safety Network. A geographic display of the current registered users as of May 2017 is shown in Figure 3. Using batchgeo. com, 218 users were mapped; 25 were not mapped, as they did not include sufficient geographical markers in their account data (eg, ZIP Code, city, or state).

Table 1 describes AgInjuryNews usage from the top 15 of 39 countries (by user sessions) and includes un-registered users' activity on the site. US users made up 76.36% of the visitor traffic during this time period. We also recorded a relatively low bounce rate, averaging 37.38% across all countries, and 33.64% for US users. Typically, websites will aim for a rate below 40%.[15] The AgInjuryNews team uses Google Analytics to track and report site usage statistics. Due to limited configurations of our current Google Analytics account, we were not able to further analyze geographic data with registered users' activity on the site.

4.1 | Prevention messages and resources

A study of prevention message use by news media, assessing 113 news reports from 2012 to 2014, was published in early 2017.[16] Researchers found that only 6% of traumatic agricultural incident news articles actually contained prevention messaging, and only 12% mentioned the use or lack of protective equipment such as helmets. To promote agricultural safety and address the preventive information gap, the AgInjuryNews team integrated links to information and resources that endorse safe agricultural practices in a category dubbed "Prevention Messages." During the process of integrating these pre-existing prevention messages into AgInjuryNews, the content was reviewed, and the AgInjuryNews team identified the need to update and consolidate these messages to more closely reflect the needs and realities facing modern farm families (eg, mechanization). System functionality was then enhanced to embed and link messages to associated injury topics within AgInjuryNews. For example, an article about a tractor run-over will link to a prevention message about keeping young children out of the worksite. The prevention messages are housed on Cultivate Safety (www.CultivateSafety.org), a mobile friendly NCCRAHS website.

As AgInjuryNews is a public site, media representatives can use this database as an information resource for future articles, thus encouraging the inclusion of prevention messages in injury/fatality articles. Furthermore, this website may facilitate the dissemination of public service announcements related to agricultural injury and injury prevention. Future studies and analyses of news reports data will uncover this initiative's effectiveness in motivating reporters and journalists to inject prevention messages into media reports.

4.2 | News reports as a data source for bureau of labor statistics

The Bureau of Labor Statistics (BLS), part of the US Department of Labor, is "the principal Federal agency responsible for measuring labor market activity, working conditions, and price changes in the economy."[17] In early 2016, conversations began with the Wisconsin office of the BLS. At that time, it was noted that BLS data specialists often use news reports as one of five sources to confirm injuries, illnesses, and fatalities in the workplace. Conversations spread through
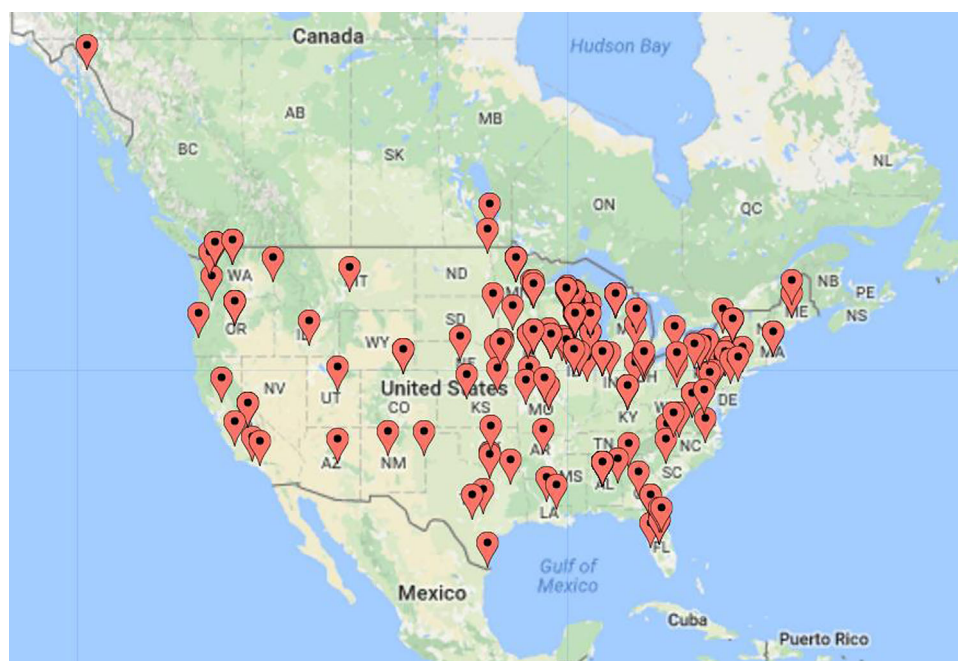

FIGURE 3 Map displaying registered US users of AgInjuryNews as of January 1, 2018. [Color figure can be viewed at wileyonlinelibrary.com]

TABLE 1 AgInjuryNews user sessions (Jan 1, 2016-Jan 1, 2018)

Country	Sessions	New users	Bounce rate (%)	Pages/session	Avg. session duration (min)
United States	5035	1332	33.64	7.0	8:27
United Kingdom	215	215	88.37	1.9	Unknown
Canada	76	59	64.47	2.8	3:40
South Korea	29	29	100	1.0	Unknown
Denmark	17	6	11.76	6.6	7:42
Argentina	14	1	0.0	6.07	5:41
China	9	1	100	1.0	Unknown
Australia	8	8	75	1.4	0:10
Germany	5	3	20	12.0	9:50
India	5	4	80	1.4	0:19
Malaysia	5	2	40	4.4	2:45
Brazil	4	4	100	1	Unknown
Italy	4	4	75	1.25	1:51
Japan	4	2	50	4.5	2:36

the Upper Midwest including this response from an anonymous user of AgInjuryNews:

> I heard about your site from the Bureau of Labor Statistics. I collect data on work fatalities for my state. I am very impressed with the site. I was searching the 2015 articles to see if I had missed any farming fatalities. You have gone to a lot of work. This is a very valuable tool for us to use.

In July 2016, the national BLS office adopted and listed AgInjuryNews as an online resource for its Census of Fatal Occupational Injuries (CFOI) data. The notice was disseminated via email to state representatives across the United States. Within 45 days, there were 21 registered users in the AgInjuryNews system with BLS.gov email addresses.

Additional comments from BLS data specialists included: "this has a lot more than I thought it would," "it really looks like it will fit our needs," and "this could be the best public site I've ever seen with this type of data, better than any internal database too for that matter."

5 | CONCLUSIONS

To our knowledge, AgInjuryNews is the largest web-based collection of searchable agricultural injury and fatality news reports data. We hope to further synchronize our data collection efforts with other National Institute for Occupational Safety and Health (NIOSH) agricultural centers to establish AgInjuryNews as the primary source of farm-related injury and fatality news reports in the United States.

It is known that media are not an all-inclusive data source for agricultural injury reporting and often only cover fatalities and traumatic injuries.[12,13] However, within the umbrella of traumatic injuries and fatalities, news reports continue to be used as a data source.[12,13,18] The AgInjuryNews database is both a repository of news reports and a valuable information source for agricultural injuries, fatalities, and agricultural injury prevention methods. This site allows users to (1) monitor trends in types of agricultural injuries; (2) identify new injury agents and emerging issues in agriculture; (3) provide safety messages for media reports in anticipation of trends and in response to injury incidents; 4) raise awareness and knowledge of agricultural injuries and prevention strategies for adults and children; and (5) serve as a data source for agricultural safety and health stakeholders and government agencies such as the Bureau of Labor Statistics.

By including injuries caused by ATVs, alternative agriculture (eg, marijuana farms and agritourism), and emerging production technologies (eg, aerial vehicles and unmanned autonomous driving and aerial vehicles), this database is becoming a hub for injury and fatality data. It is also demonstrating surveillance value for an increasing number of injuries on small and hobby farms that are not within the purview of OSHA reporting requirements. The AgInjuryNews system and corresponding CultivateSafety website are useful for a variety of purposes and users at the institutional, regional, national, and global levels.

At the institutional and organizational levels, AgInjuryNews and CultivateSafety help to keep colleagues and related organizations informed of emerging trends in agricultural injury and injury prevention, serve to motivate their respective organizations to stay engaged in injury prevention efforts, and provide opportunities for student learning projects, field work, and pilot grants. This system is also designed for agricultural safety professionals, policymakers, insurers, agribusinesses, journalists, and law officials with the potential to (1) inform and justify public policy and/or organizational policy change; (2) guide efforts to change federal/state data collection procedures; (3) guide strategies to incentivize reporters to incorporate specific details and/or prevention tips in their reports; and (4) educate law enforcement and other officials who provide incident information to media outlets and the public. These aforementioned actors within

farmers' and ranchers' spheres of influence have shown to be trusted and respected, and may also be effective in delivering health and safety messaging that drives voluntary behavioral change.[19]

Recent additions to the AgInjuryNews system, like links to prevention messages from CultivateSafety.org, ensure that users/viewers receive the most current and comprehensive agricultural injury data, along with methods to mitigate agricultural hazards and prevent injuries. It is our hope that journalists who report on traumatic events will include prevention strategies to inform the public and influence social norms regarding agricultural safety practices. These may include rollover protective structures (ROPS) on tractors and keeping young children off of all-terrain vehicles and out of dangerous worksites.

5.1 | Implications for future studies and programs

The AgInjuryNews initiative is now in the position to expand on past efforts including further website enhancements to better serve the user base and expand its data collection procedures. The use and applications for the AgInjuryNews system will continue to grow as data collection expands internationally, the search term/coding system is enhanced, and new features, such as injury prevention strategies and customizable email-delivered reports are added. Future efforts will explore and test supplemental and alternative methods to secure additional details and data beyond news reports, as sources vary in the amount and type of information published with respect to injuries and fatalities.[12,13,18]

Grounded in the socio-ecological model for framing agricultural safety and health interventions, and findings in studying Upper Midwest farmers' spheres of influence, this system is uniquely designed to reach influencers surrounding farmers and ranchers.[20,19] Improving access to prevention materials in the AgInjuryNews system may aid media representatives to include prevention messaging in their articles that could influence readers to prioritize safety on their agricultural operations. Assessment of media reporting changes over time is possible with the dataset's current inclusion of author names and the full text of all articles, which is available to the system admin team.

As one of the first agricultural safety and health informatics projects spanning the spectrum of research to practice (R2P), the AgInjuryNews system is now poised to provide an up-to-date data service and facilitate new lines of research. Future site improvements including international user registration and international data inclusion will further enable the system to continue to be comprehensive information hub pertaining to agricultural injuries, fatalities, and injury prevention strategies. The system is already demonstrating its role in national injury and fatality surveillance.[21] To our knowledge, AgInjuryNews is the most current and comprehensive dataset of agricultural injuries and fatalities publicly available. Investment in informatics-based process enhancements, such as text mining and machine learning techniques, could significantly lower overhead costs and improve data quality and overall effectiveness of the program.

AUTHORS' CONTRIBUTIONS

All authors participated in the conception or design of the work; the acquisition, analysis, or interpretation of data for the work; drafting the work and revising it critically for important intellectual content; final approval of the version to be submitted/published; and all agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

ETHICS APPROVAL AND INFORMED CONSENT

No human subjects were involved in this project.

DISCLOSURE (AUTHORS)

The authors report no conflicts of interest.

DISCLOSURE BY AJIM EDITOR OF RECORD

Steven B. Markowitz declares that he has no competing or conflicts of interest in the review and publication decision regarding this article.

DISCLAIMER

None.

ORCID

Bryan Weichelt http://orcid.org/0000-0003-2862-3114

REFERENCES

1. United States Department of Labor (USDL). Bureau of Labor Statistics (BLS). National Census of Fatal Occupational Injuries in 2015. Available online at: https://www.bls.gov/news.release/pdf/cfoi.pdf Accessed May 9, 2017.

2. Goldman M, Hendricks KJ, Meyers JR. Farm fatalities to youth 1995-2000: a comparison by age groups. *J Safety Res*. 2004;35:151–157.

3. National Institute for Occupational Safety and Health (NIOSH) Childhood Agricultural Injury Survey (CAIS) Results. 2016. Available online at: https://www.cdc.gov/niosh/topics/childag/cais/default.html Accessed May 4, 2017.

4. Lee BC, Gallagher SS, Liebman AK, Miller ME, Marlenga B, eds. 2012. *Blueprint for Protecting Children in Agriculture: The 2012 National Action Plan*. Marshfield, WI: Marshfield Clinic.

5. Weichelt B, Salzwedel M, Heiberger S, Steinmetz A, Egle S, Lee BC. 2015. Developing a collection of child Ag injury news clippings: web-based news clippings database—NCC2, Presentation at ISASH conference: Normal, IL; June 2015.

6. Leigh JP, Du J, McCurdy SA. An estimate of the U.S. government's undercount of nonfatal occupational injuries and illnesses in agriculture. *Ann Epidemiol*. 2014;24:254–259.

7. Chiu S, Cheyney M, Ramirez M, Gerr E. Where do agricultural producers get safety and health information? *J Agromedicine*. 2015; 20:265–272.

8. Evans J, Heiberger S. Agricultural media coverage of farm safety: review of the literature. *J Agromedicine*. 2016;21:91–105.

9. Wickman A. 2015. 21st Century Data Collection through Google Alerts. Oral presentation at the International Society for Agricultural Safety and Health; June 2015; Normal, IL.

10. Beaver RL, Field WE. Summary of documented fatalities in livestock manure storage and handling facilities-1975-2004. *J Agromedicine*. 2007;12:3–23.

11. Ozegovic D, Voaklander DC. What we are not talking about: an evaluation of prevention messaging in print media reporting on agricultural injuries and fatalities. *Am J Ind Med*. 2011;54:603–608.

12. Ghaffar A, Hyder AA, Bishai D. Newspaper reports as a source for injury data in developing countries. *Health Policy Plan*. 2001;16:322–325.

13. Earle-Richardson GB, Jenkins PL, Scott EE, May JJ. Improving agricultural injury surveillance: a comparison of incidence and type of injury event among three data sources. *Am J Ind Med*. 2011; 54:586–596.

14. United States Department of Labor (USDL). Bureau of Labor Statistics (BLS). Occupational Outlook Handbook: Agricultural Workers. 2015. Available online at: https://www.bls.gov/ooh/farming-fishing-and-forestry/agricultural-workers.htm Accessed May 4, 2017.

15. Reiners B. Bounce rate and average time on page: more analytical ammunition. Retrieved on 7 Jan 2018. Available online at: https://www.weidert.com/whole_brain_marketing_blog/bid/116966/bounce-rate-and-average-time-on-page-more-analytical-ammunition

16. Marlenga B, Berg RL, Gallagher SS. 2017 news reports and their role in child agricultural injury prevention. *J Agromedicine*. 22:71–77.

17. United States Department of Labor (USDL). Bureau of Labor Statistics (BLS). BLS Information: About BLS. 2017. Available online at: https://www.bls.gov/bls/infohome.htm Accessed June 1, 2017.

18. Malphurs JE, Cohen D. A newspaper surveillance study of homicide-suicide in the United States. *Am J Forensic Med Pathol*. 2002;23: 142–148.

19. Bendixsen C, Barnes K, Kieke B, Schenk D, Simich J, Keifer M. Sorting through the spheres of influence: using modified pile sorting to describe who influences dairy farmers' decision-making about safety. *J Agromedicine*. 2017;22:316–327.

20. Lee BC, Bendixsen C, Liebman AK, Gallagher S. Using the socio-ecological model to frame agricultural safety and health interventions. *J Agromedicine*. 2017;22: https://doi.org/10.1080/1059924X. 2017. 1356780

21. Weichelt B, Gorucu S. Supplemental surveillance: a review of 2015 and 2016 agricultural injury data from news reports on AgInjuryNews.org Injury Prevention Published Online First: 31 January 2018. https://doi.org/10.1136/injuryprev-2017-042671