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To cite this article: Melissa Ploeckelman, Scott Heiberger, Risto Rautiainen, Anthony Johnson, Devon Charlier, Aaron Yoder & Ellen Duysen (2024) The Use of Injury and Fatality Narratives to Convey Agricultural Safety and Health Messages and to Develop Effective Resources Through Collaborative, Multi-Disciplinary Approaches (Tell a Story, Save a Life), Journal of Agromedicine, 29:4, 645-652, DOI: [10.1080/1059924X.2024.2386105](https://doi.org/10.1080/1059924X.2024.2386105)

To link to this article: <https://doi.org/10.1080/1059924X.2024.2386105>

 Published online: 18 Aug 2024.

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The Use of Injury and Fatality Narratives to Convey Agricultural Safety and Health Messages and to Develop Effective Resources Through Collaborative, Multi-Disciplinary Approaches (Tell a Story, Save a Life)

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ABSTRACT

Objective: Storytelling engages audiences, passes down traditions and history, educates, and helps people understand and interpret their environment. Many of those who work in agriculture have been part of the storytelling tradition since childhood. Research has demonstrated the emotional impact of personal stories and how prevention information is conveyed effectively “farmer to farmer” through this method of communication.

Methods: Since 2016, the Telling the Story Project has provided a space for those directly or indirectly involved in an agricultural incident to share their story and unique perspectives on how similar incidents can be avoided.

Results: This collaborative project, developed between the National Institute for Occupational Safety and Health (NIOSH) Agriculture Safety Centers, has resulted in 11 stories on a dedicated website, safety and health resources, and educational guides. The stories and educational guidelines have been marketed extensively through traditional and social media sources, employed in safety training, and embraced by educators in agricultural programs. The website has provided a national and international reach with more than 35,000 visits.

Conclusion: Qualitative thematic analysis of the stories provided data on the circumstances leading up to each incident, valuable information on how the storytellers interpreted the aftermath, and a novel perspective on how safety professionals can create messaging that will resonate with the farming community.

KEYWORDS

Agriculture; education; fatality narrative; health; injury; outreach; risk communication; safety; storytelling

Introduction

Through the ages, storytelling has been used to engage audiences, pass down traditions and history, educate, and help people understand and interpret their environment. First-person narratives shared by our hunter-gatherer ancestors were associated with increased cooperation, a trait essential to survival.¹ In the field of Public Health, storytelling is effective in increasing knowledge, changing attitudes, and improving health behaviors.^{2,3} Using personal stories helps people relate to one another, allows them to picture themselves behaving differently, and, in turn, reduces resistance and inspires new health behaviors.⁴ Relating stories can provide an effective way for both the tellers of story and their listeners to find meaning in events, provide

context to what is being taught, transmit emotion along with information, develop a professional identity, build empathy, and compassion, and help with remembering events and lessons learned.⁵ The scientific community has embraced the power and utility of storytelling, and the practice has been well-researched in the fields of psychology^{6,7} and neurobiology.^{8,9} Moreover, narratives effectively address grief and loss.^{10,11}

Within agricultural communities, there exists a rich history of storytelling.¹ Farming and ranching traditions and practices are passed down through oral history and personal narratives. Many farmers and ranchers have been part of the storytelling tradition since childhood. Agricultural producers have used storytelling to market their commodities; research has shown this to be an

effective tool.¹² An exploratory study found through interviews with agricultural injury victims, their next of kin, and family members that storytelling likely plays a role in dealing emotionally with the aftermath of severe agricultural incidents.¹³

Agricultural workers face many health and safety hazards on the farm and ranch, recording one of the highest fatality and injury rates of any occupation.¹⁴ With 12% of Midwestern US farmers reporting at least one injury each year,¹⁵ and 453 agriculture-related deaths in 2021,¹⁴ the need for continued and novel safety interventions is evident.

It was with consideration for providing a space for those directly or indirectly involved in an agricultural injury incident to share their story, and with an understanding of the educational benefits to the listeners, that the Telling the Story Project (TTSP) was conceived. The goal of this project was to have readers connect on a cultural, intellectual, and emotional level with the storytellers, thereby moving them to integrate safety practices into their work.

This collaborative project provides a platform for those affected by agricultural incidents to recount the event from their unique perspective. Injury prevention messages and links to resources are included on the webpage, thereby increasing knowledge regarding work hazards and reinforcing positive safety behaviors in those who hear the stories. Utilizing videotaped interviews and written narratives, the TTSP provides farmers, farm workers, and ranchers who have been directly involved in an agriculture incident or a family member an opportunity to share their story.

The TTSP website, www.tellingthestoryproject.org,¹⁶ houses personal narratives, videos, and educational resources that provide additional information regarding the hazards outlined in each story. Storytellers can express emotions related to the incident through their narrative and video. The stories are used as a pedagogical tool for those who work in agriculture as well as for students, as a valuable resource for those working in safety. The TTSP stories are shared widely with the media, as agricultural media is an important source of information for farmers.^{17,18} While the

TTSP intends to reach a wide audience, the target audience includes agricultural workers, their families, agricultural media and the mainstream press, safety professionals, agriculture educators, students, and extension specialists.

This article describes the process of collecting, editing, formatting, housing, disseminating, and analyzing the personal narratives of those who have experienced agricultural injuries or have lost a loved one to an incident. Results illustrate ways in which narratives can be shared broadly through effective marketing, and how using thematic analysis to examine the narratives may lead to the development of novel safety messages. The methods described below provide a roadmap for those who want to use storytelling to improve their stakeholders' understanding of a particular topic.

Program development

This project was certified as exempt by Internal Review Boards (IRBs) at the University of Nebraska Medical Center, Marshfield Clinic Research Institute (National Farm Medicine Center), University of Minnesota, and the University of Iowa.

Work began in 2016 on the TTSP collaborative project. Individuals from four agricultural safety and health centers, three of them funded by the National Institute for Occupational Safety and Health (NIOSH), were involved in the development and administration of the project. The original NIOSH-funded centers participating included the Great Plains Center for Agricultural Health (GPCAH), the Upper Midwest Agricultural Safety and Health Center (UMASH), and the Central States Center for Agricultural Safety and Health (CS-CASH), as well as the National Farm Medicine Center, Marshfield, Wisconsin. In 2022, the NIOSH-funded National Children's Center for Rural and Agricultural Health and Safety (NCCRAHS) replaced the GPCAH on the project. The project team includes members with expertise in industrial hygiene, Fatality Assessment and Control Evaluation investigations (FACE), agricultural engineering, evaluation, journalism, videography and recording, media relations, curriculum development, and educational outreach. Specific guidelines, shown in [Figure 1](#),

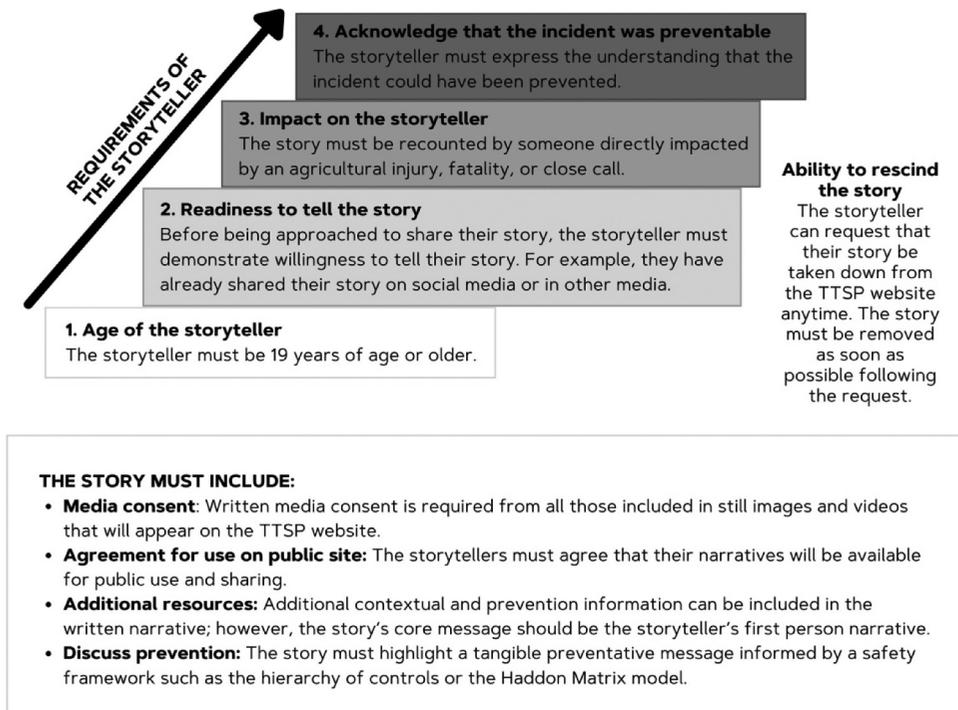


Figure 1. Telling the story project guidelines.

were developed to guide the acceptance, writing, and dissemination of the TTSP stories. The project website, www.tellingthestoryproject.org,¹⁶ is housed on a WordPress platform. Figure 2

outlines the interview, writing, and recording process for each TTSP story.

Educational materials and resources related to the story are included on the website, assisting

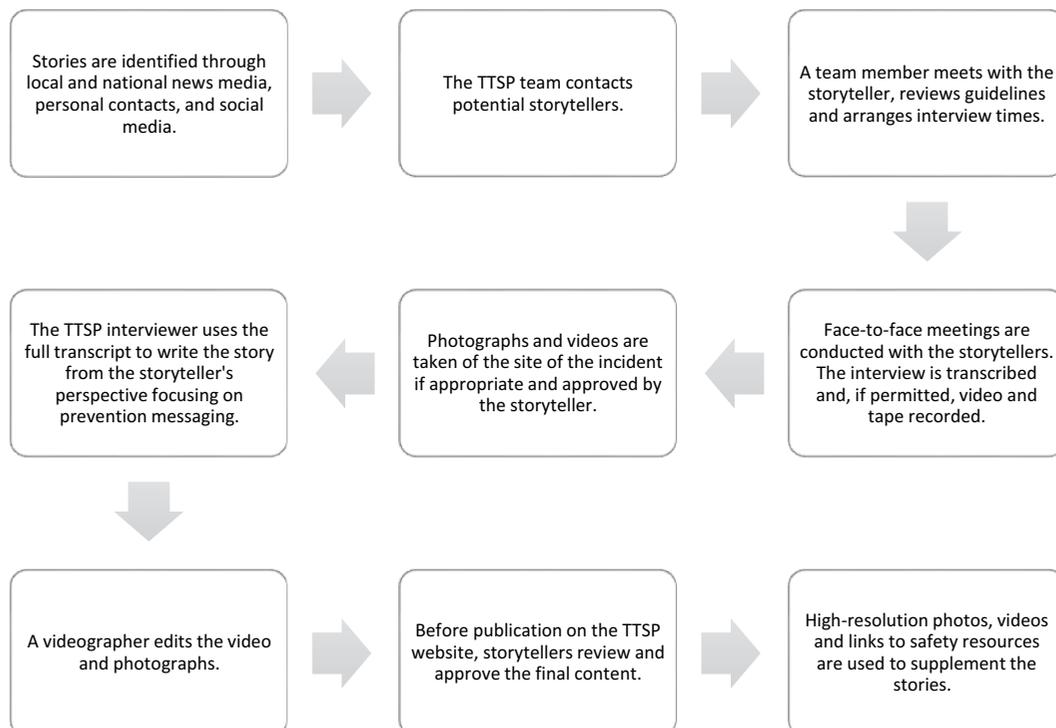


Figure 2. Telling the story project interview, writing and recording process.

readers in identifying best practices to work safely. Discussion guides are prepared to support educators and safety professionals using these stories during classroom discussions and training. Some stories are shared as vignettes, short accounts of agricultural incidents accompanied by prevention messages and resources. Agricultural incidents in the media that fit the storytelling model but have not been written by the TTSP team are also shared on the TTSP website. Cartoonist Rick Friday created story frames that capture safety and health messages in a cartoon format.

The stories and resources on the website are marketed using social media, press releases, and feature articles in agricultural magazines and journals. Media toolkits are created to encourage health and safety partners to share the TTSP stories. The kits are packaged for easy sharing and are disseminated via email to the TTSP team members' networks.

Qualitative perspective of the stories

Thematic analysis was used to identify and report common patterns and themes within 11 TTSP stories. The complete “raw” transcripts of each interview were coded. Coding, analysis, and visualization were accomplished using Microsoft Excel (Microsoft Corporation, 2018), Microsoft Power BI (Microsoft Corporation, 2018), and the qualitative analysis software MAXQDA (Berlin, Germany). The coders (C1 and C2) were public health safety professionals; one was an expert in thematic analysis (C1), and both were experts in agricultural hazards. The 11 narratives were compiled in Excel and split into individual meaning units by C1, and then each unit was condensed. Each meaning unit recorded was associated with the incident. Units of the narrative that did not directly relate to the incident were not coded, such as when a storyteller discussed details of their current job. The data were then disassembled and coded into 16 descriptive groups by C1 and C2. The groups were defined as the coders analyzed the meaning units, rather than using predetermined labels. Excel was used to pull themes and sub-themes from these data, and this information was sorted into meaning units by C1 and C2. Data

were visualized using Excel Power BI, and interrater reliability was calculated using MAXQDA.

Project outcomes and outputs

Created in 2017, the TTSP website www.tellingthestoryproject.org been visited 35,771 times as of September 2023. The number of views of the stories, vignettes, and supplementary materials as of September 2023 are shown in [Table 1](#).

Media releases featuring TTSP stories are sent to a database of more than 300 agricultural communicators. TTSP stories and reports of the project have been published in a wide range of agricultural media publications including *Midwest Farm Report*, *Farm Progress*, *Rural Radio*, *Brownfield Ag News*, *U.S. News and World Reports*, *Iowa Farmer Today*, *AgProud*, *Capital Press*, and the *Omaha World Herald*. TTSP stories have been regularly featured in *Safety Watch* columns of *Iowa Farmer Today* affiliated publications, reaching over 84,000 households in the Midwest, and online.

Messaging using an TTSP media kit reached over 15,000 users via Facebook, Instagram, and Twitter. One Facebook post featuring the Mike Biadasz story was shared more than 20 times and reached over 2,500 users. The TTSP team also received positive feedback on the toolkit, such as this one from a Minnesota teacher: “Teaching in a more urban area, very few of my students have hands-on, production agriculture experience. I will share some of the photos/stories with them.”

The TTSP model has been adopted by other organizations, notably the National Children’s Center for Rural and Agricultural Health and Safety’s (NCCRAHS) “Storytelling” project.

Qualitative perspective – what the storytellers can teach us about communicating safety

From 11 stories, we found 215 meaning units. Each meaning unit was a sentence or phrase from the storyteller that was related to the incident (who, what, where, when, and how), description of additional agricultural incidents in which the storyteller was involved, and reflections on agricultural safety practices that could have prevented the incident. Each meaning unit ($n = 215$) was

Table 1. Telling the story project - story and section details and webpage analytics.

Hazard	Title	Fatal – Nonfatal	State in which Incident Occurred	Gender	Webpage Views Feb. 2017-Sept. 2023
Stories					
ATV	David's Story	Nonfatal	Nebraska	Male	918
	Kenny's Story	Nonfatal	Iowa	Male	1826
Livestock	Susan's Story	Nonfatal	Nebraska	Female	832
Tractor and Machinery	Brian's Story	Nonfatal	Iowa	Male	1169
Fire	Leon's Story	Nonfatal	Iowa	Male	1559
Ladder	Steph's Story	Nonfatal	Iowa	Female	1820
	Rick and Juan Story	Nonfatal	Iowa	Male	1568
	Brad's Story	Nonfatal	Wisconsin	Male	1206
Machinery Gases	Mike Story	Fatal	Wisconsin	Male	4020
	Jerry's Story	Nonfatal	South Dakota	Male	1826
	Jason and Roxanne Story	Nonfatal	Iowa	Male	1383
Website Sections					
Vignettes	Lawnmower	Nonfatal	Kentucky	Female	754
	Amputation		Wisconsin	Male	
Discussion Guides	Mike's Story	Fatal	Wisconsin	Male	932
	Steph's Story	Nonfatal	Iowa	Female	
	David's Story	Nonfatal	Nebraska	Male	
	Jerry's Story	Nonfatal	South Dakota	Male	
	Brad's Story	Nonfatal	Wisconsin	Male	
	Susan's Story	Nonfatal	Nebraska	Female	
Resources	NA	NA	NA	NA	1568
Story Frames	NA	NA	NA	NA	832
More	NA	NA	U.S. and International	NA	742

transcribed into a database. Nine themes emerged from 193 of the meaning units, with 22 meaning units not fitting a theme. Figure 3 shows the themes and examples of the meaning units that fit the theme. The most common themes were thoughts during the incident, reflections on the cause of the incident, and positive outcomes since the incident. Four subthemes were constructed from the nine themes including discussion of safety perspectives, the farm environment, risks, and unclassified. The most common words identified in the meaning units were work, hurt, time, and safety. Commonalities in themes were found to be independent of storyteller gender, location, and type of incident, except for Mike's story, the only story recounting a fatality.

Discussion

Narratives that cause us to pay attention and involve us emotionally have been shown through research to be the stories that move us to action.⁹ Creating such narratives was the intent of the TTSP initiative: to provide first-person accounts that would motivate the reader toward safer

behaviors when working in agriculture. Compared to a didactic delivery, narrative messages involve audiences emotionally as well as cognitively, shaping feelings as well as building mental models.¹⁹

As an effective outreach tool, storytelling has been shown to capture and maintain an audience's attention more effectively than traditional lectures or presentations.²⁰ Stories often include cultural references, fostering a sense of connection and relevance for diverse audiences.⁵ The TTSP aims to foster this connection between those involved in an agricultural incident and those reading and hearing the stories on the website, thereby motivating the website visitors to further explore ways to reduce risk and increase a safe environment.

The impact of the safety narrative is amplified by research that shows farmers consider other farmers to be trusted sources of information.²¹ The TTSP platform has allowed storytellers to share their perceptions about what went wrong and then provide a message about how to prevent or avoid similar incidents. Although research has not yet been conducted by the TTSP team on the changes in attitude,

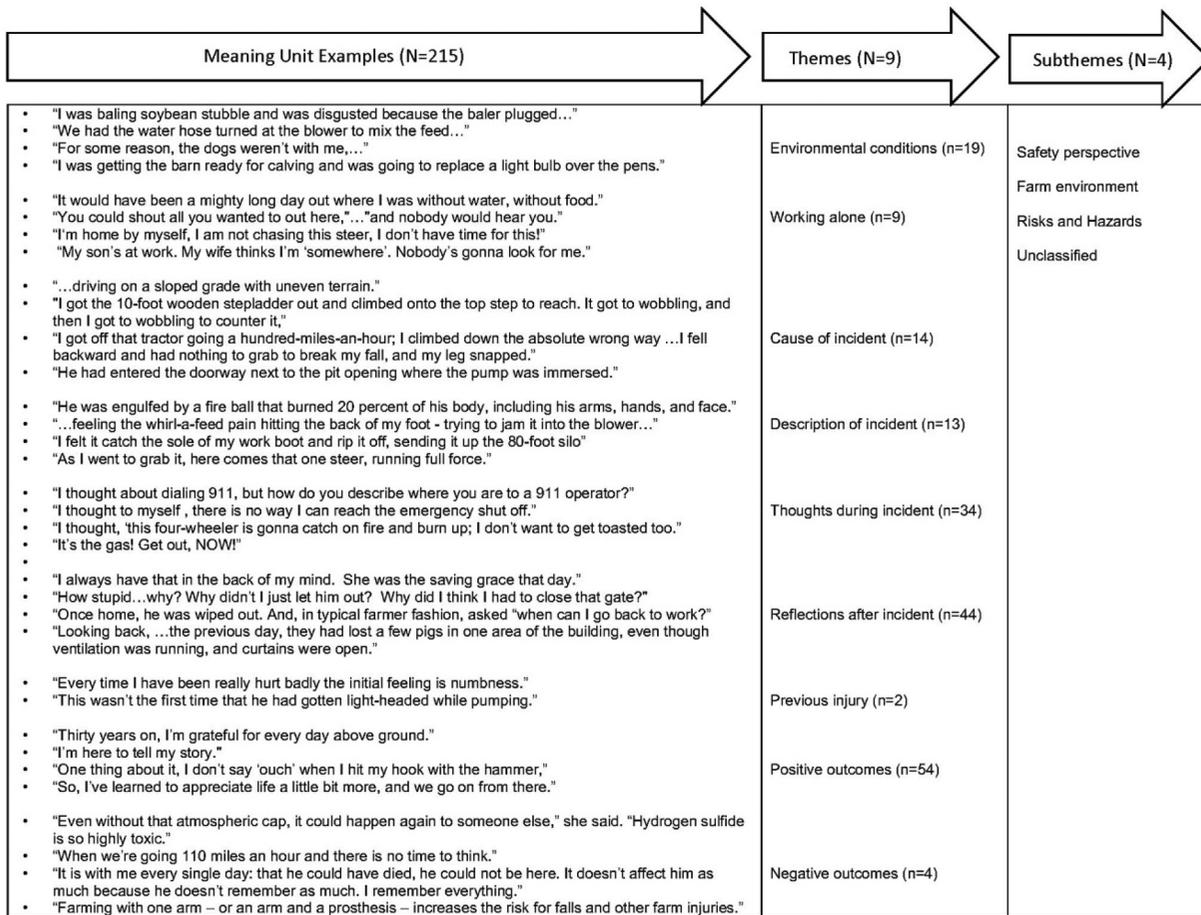


Figure 3. TTSP qualitative analysis, meaning units, themes and subthemes.

knowledge, or safety behavior of those hearing and reading the stories, the number of visits to the website over 6 years and the average length of time viewers spent on the site (2 minutes, 35 seconds) indicates engagement with the stories. In 2022, the average time spent on a website was 56 seconds.²²

Storytellers indicate sharing their experiences has been positive. The family of Mike Biadasz, who told the story of Mike's death due to hydrogen sulfide exposure, established a rebate program for farmers who rent portable gas monitors, and they continue to share their safety message. Many of the storytellers have been interviewed by media following the release of their story on the TTSP website. The details of the TTSP have been shared as workshops and presentations at safety and health conferences, leading to inquiries from other organizations interested in modeling this project.

Creating curriculum guides has allowed the TTSP stories to be integrated into the classroom for use by agricultural teachers. These allow instructors to

bring agricultural safety and health messages into the classroom in a way that elevates student learning by engaging the students in analyzing and evaluating the relatable content of the stories.

Qualitative thematic analysis allows researchers to organize the content of the stories and interpret aspects of personal narratives.²³ We will use these data to inform educational resources and to help understand how to prevent similar incidents. We found common subthemes in the stories, including very detailed descriptions of the environment in which the incident occurred. Some examples of these descriptions include: "For this particular load, I pulled up to the blower, crawled from the tractor to the blower tractor and ramped up the RPMs, then went back to my wagon tractor and started the PTO to unload the wagon"; and "So I went in, set the two buckets down, and reached back to get the gate."

Even years after the incident most storytellers seemed to have significant recall regarding the hazardous environment in which they were injured. This may be related to the storyteller's self-reflection over

time to the question “how did this happen to me?” Trauma research has found when an individual experiences a physically traumatic event, their episodic memory can be affected. So, while each story may not reflect precise details of the incident, each story is told from the storyteller’s best recollection of the event. Understanding the environment and the events that led up to the incident can provide valuable information on how similar incidents can be prevented.

Safety messages were a common subtheme as well. Since all stories on the website were required to have a safety component, this is not a surprising finding. However, each storyteller’s take on prevention came from their unique perspective. For example, “Had I taken just a couple more seconds and walked around the blower instead of reaching across I would not have been part of that farm accident,” and “Always keep your cell phone with you.” These safety messages can resonate with other farmers and ranchers who may have been in similar situations.

One of the surprising outcomes from the analysis was the number of times the storytellers discussed positive outcomes ($n = 54$) versus negative outcomes ($n = 4$). The storytellers chose to focus on the positive outcomes of the incident. Their positivity can be seen in some of these examples, “I am fortunate I’m one of those farmers in the neighborhood that still has all my fingers and thumbs”; “I was without both arms. But I rely on my neighbors and friends who I know I can call, and they will always be willing to come help when we need them.” Using a positive message to relay the outcome of a traumatic incident demonstrates resilience in these agricultural producers, “Some people have told me to go on disability, but I wouldn’t want any other job.” This finding may guide how outreach messaging could be conveyed to agricultural workers, projecting a positive outcome for instance, “You wouldn’t want any other job, so protect yourself doing this one.”

Future work

The TTSP collaborative team continues to add stories, vignettes, teacher guides, and accounts from the media. Impact will be evaluated from the storyteller’s perspective and for those who engage with the stories on the website. The team

will be formatting some of the storyteller’s videos to be placed on the U.S. Ag Center’s YouTube channel,²⁴ furthering the reach of the stories.

Conclusion

The Telling the Story Project has provided those affected by an agriculture-related injury or fatality an opportunity to convey a message of prevention through their unique perspective. The narratives have provided information on the details surrounding the incident, perceived risks, and unique safety perspectives of our storytellers. These details can be used to better understand the circumstances leading up to an incident and how to create safety messages that will resonate with the farming community.

Acknowledgments

Special thanks to Stephanie Leonard for her exceptional work interviewing, composing narratives, videotaping participants, and managing the website; to Kelley Webworks for hosting the TTS Project website; to Marie Fleisner for sharing her editing expertise; and importantly, to all the storytellers who graciously shared their stories. This project was funded by NIOSH Agriculture, Forestry and Fishing Grant to the Central States Center for Agricultural Safety and Health, cooperative agreement U54OH010162, and to the Upper Midwest Agricultural Safety and Health, cooperative agreement U54OH010170. Funding for the National Children’s Center for Rural and Agricultural Health and Safety is provided by the National Institute for Occupational Safety and Health, cooperative agreement U54OH009568.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

The work was supported by the NIOSH Agriculture, Forestry and Fishing Grant to the Upper Midwest Agricultural Safety and Health, cooperative agreement U54OH010170 [U54OH010170]; NIOSH Agriculture, Forestry and Fishing Grant to the Central States Center for Agricultural Safety and Health, cooperative agreement U54OH010162 [U54OH010162]; University of Nebraska Medical Center - Central States Center for Agricultural Safety and Health (U54OH010162); University of Minnesota - Upper Midwest Agricultural Safety and Health (U54OH010170); Marshfield Clinic - National Children’s Center for Rural and Agricultural Health and Safety - (U54OH009568).

References

- Smith D, Schlaepfer P, Major K, et al. Cooperation and the evolution of hunter-gatherer storytelling. *Nat Commun.* 2017;8(1):1853. doi:10.1038/s41467-017-02036-8.
- Lipsey AF, Waterman AD, Wood EH, Balliet W. Evaluation of first-person storytelling on changing health-related attitudes, knowledge, behaviors, and outcomes: a scoping review. *Patient Educ Couns.* 2020;103(10):1922–1934. doi:10.1016/j.pec.2020.04.014.
- Mahdavi Z, Amiri-Farahani L, Pezaro S. Storytelling in pregnancy and childbirth: an integrative review of the literature. *J Pregnancy.* 2022;2022:8483777. doi:10.1155/2022/8483777.
- Perrier MJ, Martin Ginis KA. Changing health-promoting behaviours through narrative interventions: a systematic review. *J Health Psychol.* 2018;23(11):1499–1517. doi:10.1177/1359105316656243.
- Freitag B, Hicks T, Jerolleman A, Walsh W. Storytelling-plots of resilience, learning, and discovery in emergency management. *J Emerg Manag.* 2020;18(5):363–371. doi:10.5055/jem.2020.0485.
- Fish J, Syed M. Digital storytelling methodologies: recommendations for a participatory approach to engaging underrepresented communities in counseling psychology research. *J Couns Psychol.* 2021;68(3):271–285. doi:10.1037/cou0000532.
- Kulish N. The power of stories. *J Am Psychoanal Assoc.* 2022;70(5):829–844. doi:10.1177/00030651221121149.
- Suzuki WA, Feliú-Mójer MI, Hasson U, Yehuda R, Zarate JM. Dialogues: the science and power of storytelling. *J Neurosci.* 2018;38(44):9468–9470. doi:10.1523/JNEUROSCI.1942-18.2018.
- Zak PJ. Why inspiring stories make us react: the neuroscience of narrative. *Cerebrum.* 2015;2.
- Bunkers SS, Flinn E, Letcher D, et al. Storytelling and the humanbecoming family Model. *Nurs Sci Q.* 2022;35(2):184–190. doi:10.1177/08943184211070594.
- Rolbiecki AJ, Washington KT, Bitsicas K. Digital storytelling as an intervention for bereaved family members. *Omega (Westport).* 2021;82(4):570–586. doi:10.1177/0030222819825513.
- Yueh HP, Zheng YL. Effectiveness of storytelling in agricultural marketing: scale development and Model evaluation. *Front Psychol.* 2019;10:452. doi:10.3389/fpsyg.2019.00452.
- Robertson SM, Murphy DJ, Davis LA. Social and emotional impacts of farmwork injuries: an exploratory study. *J Rural Health.* 2006;22(1):26–35. doi:10.1111/j.1748-0361.2006.00001.x.
- U.S. Bureau of Labor Statistics. Graphics for Economic News Releases. Number and rate of fatal work injuries, by private industry sector. <https://www.bls.gov/charts/census-of-fatal-occupational-injuries/number-and-rate-of-fatal-work-injuries-by-industry.htm>. Accessed August 22, 2023.
- Ouattara BS, Beseler CL, Rautiainen RH. Agricultural injuries: risk factors and severity by affected body part among US (Midwest) farmers. *J Agromedicine.* 2023;28(2):214–223. doi:10.1080/1059924X.2022.2089421.
- Telling the story project – tell a story, save a life. <https://proofpointisolation.com/browser?url=https%3A%2F%2Ftellingthestoryproject.org%2F>. Accessed January 24, 2024.
- Evans J, Heiberger S. Agricultural media coverage of farm safety: review of the literature. *J Agromedicine.* 2016;21(1):91–105. doi:10.1080/1059924X.2015.1106376.
- Reed DB, Claunch DT. Protecting ourselves from harm: voices of aging farmers. *J Agric Saf Health.* 2015;21(4):269–279. doi:10.13031/jash.21.11100.
- Lee HJ. Comparative analysis of a client’s verbal responses in counseling sessions: quantitative case study. *Psychol Rep.* 2011;108(2):638–648. doi:10.2466/02.15.20.PR0.108.2.638-648.
- Foelske M. Digital storytelling: the impact on student engagement, motivation and academic learning. *Graduate Research Papers 167.* <https://scholarworks.uni.edu/grp/167>. 2014.
- Burgus S, Duysen E, Wendl M. What influences farmers to use farm safety and health information? *The J Ext.* 2017;55(1). 10.34068/joe.55.01.16.
- Advisor F. Top website statistics for 2023. https://www.forbes.com/advisor/business/software/website-statistics/#sources_section. Accessed October 4, 2023.
- Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Res In Phychol.* 2006;3(2):77–101. doi:10.1191/1478088706qp063oa.
- U.S. Agricultural Safety and Health Centers—YouTube. <https://www.youtube.com/user/USAgCenters>. Accessed January 24, 2024.