



National Children's Center for Rural and Agricultural Health and Safety

Annual Report
October 2022 – September 2023

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National Children's Center

for Rural and Agricultural Health and Safety

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National Children's Center
for Rural and Agricultural Health and Safety

The National Children's Center for Rural and Agricultural Health and Safety strives to enhance the health and safety of all children exposed to hazards associated with agricultural work and rural environments.

Welcome From the Director

We hope you enjoy reading about our fiscal year 2023 accomplishments along with plans for the future. With continued funding from NIOSH, the National Children's Center for Rural and Agricultural Health and Safety (NCCRAHS) provides national-level leadership, research, and outreach activities to enhance the health and safety of all children exposed to hazards associated with agricultural work and rural environments.



Highlights of the year included:

- Completion of an 18-month endeavor to develop a special issue of *Frontiers in Public Health*, titled Safeguarding Youth from Agricultural Injury and Illness: International Perspectives. This included 29 manuscripts from 13 countries and provided the basis for several international webinars and conference panels.
- Establishment of our new Policy Working Group to identify and provide potential policy-based safety and health strategies.
- Engagement in policy-related meetings and planning regarding childcare support for rural communities and child labor regulations for working youth in agriculture.
- Creation of our Diversity, Equity, Inclusivity and Accessibility (DEIA) committee to develop, promote, and evaluate DEIA efforts within our Center by leveraging policies and practices associated with our infrastructure and project activities.
- Dissemination of research findings and safety recommendations via publications, presentations, abstracts, posters, webinars, media interviews, and press releases by Center scientists and staff.
- Review and realignment of selected administrative duties in preparation for leadership succession, with Andrea Swenson, PhD named as the Associate Director.
- Hosting of a 3-day series of in-person meetings, including the project team for National Action Plan, a visit by NIOSH Agriculture Program leader, Jennifer Lincoln, PhD and her colleague, KC Elliott, and representatives from eight of the regional NIOSH Ag Centers.

At a personal level this year I felt especially grateful for support from our NCCRAHS staff. Following a serious auto/truck crash in June, my multi-trauma rehabilitation required a 3-month medical leave. Andrea Swenson got an unplanned leadership orientation, assuming the role of interim Center Director, with help from Casper Bendixsen. Your feedback is always welcome and your ongoing support of improving the well-being of children living and working in agricultural environments is absolutely appreciated.

Best regards,

A handwritten signature in blue ink that reads "Barbara Lee".

Section 1: Planning and Evaluation Core

Barbara Lee, PhD

The goal of the National Children's Center for Rural and Agricultural Health and Safety's (NCCRAHS) Planning and Evaluation Core is to strategically guide overall activities of the Center as we address the mission to enhance the health and safety of all children exposed to hazards associated with agricultural work and rural environments. The Planning and Evaluation Core, including the Director, Associate Director, Evaluation Lead, Outreach Core Leader, Research Core Leader, and Senior Advisor, meets twice monthly to ensure the Center-wide and individual projects are effectively and efficiently planned, implemented, and evaluated. Focus during this year of the grant cycle included reviewing current processes, establishing priorities for growth and development, promoting manuscript preparations, ensuring adequate budgeting and staffing of projects, and providing support for projects to achieve their goals.

Evaluation

Andrea Swenson, PhD, Marshfield Clinic Research Institute



The Evaluation team provides infrastructure, personnel, and support to effectively monitor and evaluate NCCRAHS to continually improve the quality of the Center. Individual project meetings were held at the beginning of year two to review logic models and evaluation metrics for each of projects as well as address any questions or concerns with reporting processes. Quarterly reports based on the metrics were revised and submitted by project teams. A summary report was created for each quarter and shared with all staff. A dashboard of key evaluation metrics continues to be updated and shared during meetings to visualize progress towards key objectives. The evaluation core continued monitoring and gathering evidence for the contribution analysis.

Stakeholder Advisory Board (SAB)

The SAB is composed of eight advisors knowledgeable about agricultural health and safety, influential within agricultural communities, and with a vested interest in promoting childhood safety and well-being as well as mitigating childhood injuries and disease. The SAB provides input to NCCRAHS leadership regarding the Center-wide goals and objectives, especially the primary objectives to 1) increase the number of individuals and organizations engaged in agricultural childhood injury prevention as well as increase their knowledge of the field and 2) ensure research is being translated effectively and disseminated to the wider field of professionals and to agricultural communities.

The SAB convened virtually with Center leadership, PIs, and project staff on November 8, 2022. The Planning and Evaluation Core and Principal Investigators (PIs) provided updates and solicited feedback from SAB members. A hybrid in-person/virtual meeting was held

May 16-17, 2023. The agenda addressed progress on Center goals and individual research objectives, review of evaluation findings, planning process for the National Action Plan, and increasing impact. Advisors held an executive session, then reported back on their perspectives of Center progress and recommendations for addressing areas of weakness.

SAB members include:

Name	Affiliation
Dee Jepsen, PhD, Chair	Ohio State University
Joseph Grzywacz, PhD	Florida State University
Matthew Keifer, MD, MPH	Emeritus NFMDC Director
Bryan Kuhl	Progressive Agriculture Foundation
Jennifer Leonardo, PhD, MSW	Children's Safety Network
Athena Ramos, PhD	University of Nebraska Medical Center
David Schwebel, PhD	University of Alabama at Birmingham
Suzanne Wright, MD	Marshfield Clinic Health System



NCCRAHS Staff and Stakeholder Advisory Board, May 17, 2023. Pictured: Bottom row (left to right): Florence Becot, Susan Wright, Athena Ramos, Dee Jepsen, David Schwebel, Marsha Salzwedel. Top row (left to right): Richard Burke, Barbara Lee, Josie Rudolphi, Joe Grzywacz, Bryan Kuhl, Matthew Keifer, Bryan Weichelt, Andrea Swenson, Kathleen Smith, Jeffrey VanWomer,

Policy Work Group



The NCCRAHS Policy Working Group (PWG) was established to identify, develop, and promote potential policy-based safety and health solutions by leveraging knowledge gained through research and outreach activities associated with NCCRAHS priorities. The PWG monitors industry and policy activities for potential policy relevant strategies connected to NCCRAHS' priorities, and proposes policy-relevant solutions emanating from research findings, outreach activities, and public input. Our center maintains an ongoing list of its policy-related activities. Inserting language regarding rural childcare support into the 2025 Farm Bill was a point of emphasis in Florence Becot's meetings with federal-level congressional representatives. Additionally, several staff participated in meetings and e-communications to review proposed changes in state-level child labor laws.

Frontiers in Public Health Special Issue

Frontiers in Public Health, a multidisciplinary open-access journal, has published "Safeguarding Youth from Agricultural Injury and Illness: International Perspectives," a collection of 29 manuscripts with commentaries representing perspectives from eight countries, plus research from an additional three countries. Guest Editor Barbara Lee, Ph.D. assembled a team of editors that included NCCRAHS-based scientists Florence Becot, Ph.D.; Andrea Swenson, Ph.D.; Casper Bendixsen, Ph.D.; and Bryan Weichelt, Ph.D.; and international editors Peter Lundqvist, Ph.D. (Sweden); and Richard Franklin, Ph.D. (Australia). Christopher Benny served as issue coordinator. The special issue can be printed as an e-book. Lee and team promoted the special issue via webinars and international conferences.

 frontiers | Research Topics

Safeguarding youth from agricultural injury and illness: International experiences

Edited by
Barbara Lee, Ph.D., NCCRAHS, Barbara Lee, Ph.D., NCCRAHS, Barbara Lee, Ph.D., NCCRAHS, Barbara Lee, Ph.D., NCCRAHS

Coordinated by
Christopher Benny

Published in
Frontiers in Public Health, Volume 11, Article 1123281, 2023



Diversity, Equity, Inclusion, and Accessibility Committee

The Center continues to assess diversity, equity, inclusion, and accessibility (DEIA) efforts through an establishment of a committee dedicated to identifying gaps in knowledge areas and engaging experts. The DEIA committee worked together to identify values and develop core principles guiding DEIA within the Center.

Emerging Issues Program



The emerging issues program (EIP) addresses new and unresolved environmental, policy, technology, and agricultural production issues affecting the well-being of children. Two EIP projects were funded during 2023: Phenome-Wide Association Study (PheWAS) and Incident versus Accident Terminology. As part of the national workgroup for

EIP/Pilot program directors initiative, we organized and hosted an in-person workgroup meeting in Omaha, NE, in July 2023, which fostered collaboration and shared learning within pilot and emerging issues programs.

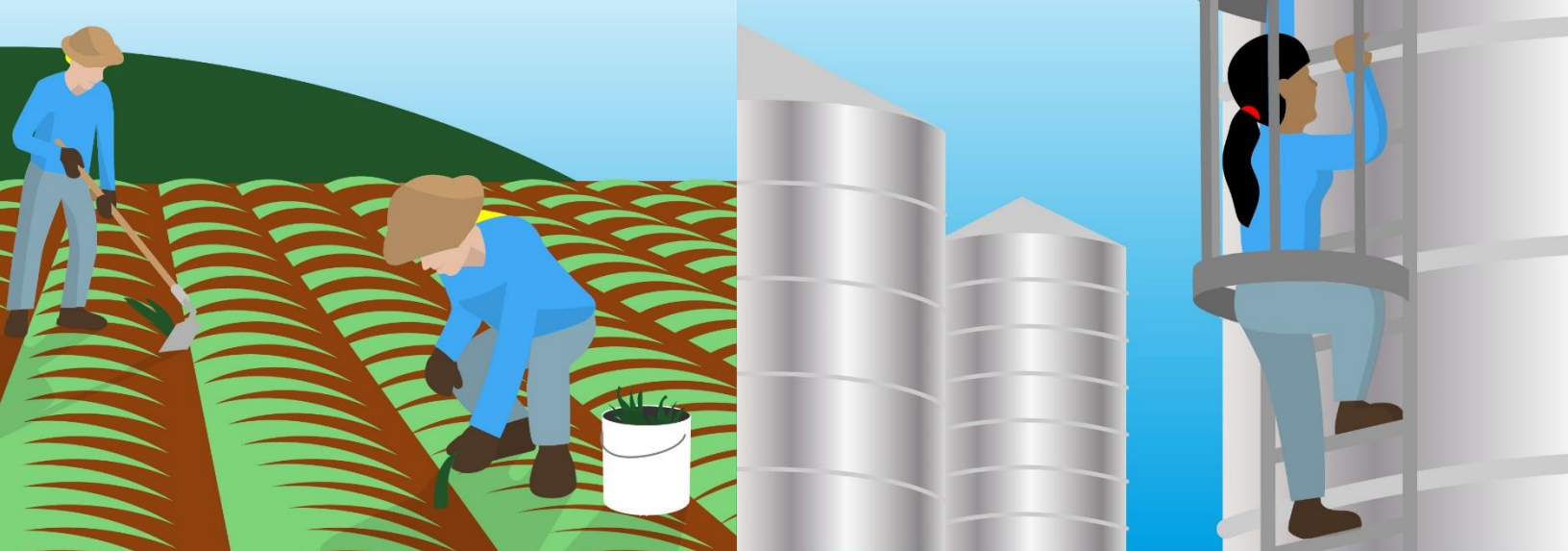
2023 Project Summaries:

PheWAS: The PheWAS project used the cohort developed by the [Surveillance of Medically Attended Injuries](#) project to conduct a Phenome-Wide Association Study (PheWAS). The aims of this project were (a) to estimate the differences in the burden of health conditions between children and adolescents who live vs. do not live on farms and, (b) identify subgroups of farm children and adolescents who are at the highest risk of, or with the highest protection from, health conditions most likely to impact farm residents. Thirty-six significant phenotypic “Phecodes” were identified and coded into generalizable phenotypes. Farm youth were protected against multiple mental health conditions, respiratory conditions, and infectious diseases, while being at higher risk for injuries, eye disorders, and nerve inflammation, compared to non-farm youth. Further analysis of non-transient conditions revealed farm youth retained protection against mental health conditions, notably depression and anxiety disorders as well as respiratory conditions.

Incident versus Accident Terminology: In response to the need for precise language in reporting childhood agricultural injuries, this initiative gauged U.S. media reactions to replacing the term "accident" with "incident" in news reports. The project's first aim identified U.S. news media reports on AgInjuryNews.org from June 2022 to February 2023 that referred to childhood agricultural injuries as "accidents." The team identified 31 reports that met the criteria. Subsequently, 30 media members were contacted, with a majority responding positively to the terminology shift. An additional analysis of news reports extracted from AgInjuryNews.org between 2016 and 2022, involving childhood agricultural injuries (aged 0-17), identified a total of 719 reports and 566 incidents, with a collective of 982 young victims. The term "accident" was prevalent, with 276 (38.39%) of the articles featuring it in the title and 451 (62.73%) in the narrative. In contrast, news reports involving adult victims (age >17) had a lower prevalence of the term "accident," with 1,346 (31.7%) instances in article titles and 2,166 (51%) in narratives. This analysis underscores the distinction in terminology between childhood and adult agricultural injuries in news reports.

2024 Funded Projects: As Year 3 came to a close, Emerging Issues projects for 2024 were solicited and reviewed. The following projects have been selected for funding for Year 4:

- *A Mother's Gameplan for Safety and Health*, Amy Rademaker, Carle Center for Rural Health and Farm Safety
- *Emerging Science on Agricultural Use of Respiratory Protection Devices by Farm Youth*, Jenna Gibbs, PhD, Ag Health and Safety Alliance™
- *Understanding Barriers to Healthcare Access for Children in Latina/o Farmworkers Household*, Hazel Velasco Palacios, The Pennsylvania State University



Section 2: Outreach Core

Key Personnel: Marsha Salzwedel, Scott Heiberger, Matt Pilz, Christopher Wanat, Melissa Ploeckelman

The Outreach Core works to mobilize child agricultural health and safety knowledge, ensuring safety resources and information are promoted and disseminated to farm families, young workers and associated agricultural industry members, who benefit through reduced child injuries and fatalities. The Outreach Core team translates child agricultural health and safety research findings into practice through communication messaging, dissemination activities and the Childhood Agricultural Safety Network, engaging with stakeholders to build and sustain capacity in child agricultural safety and health.

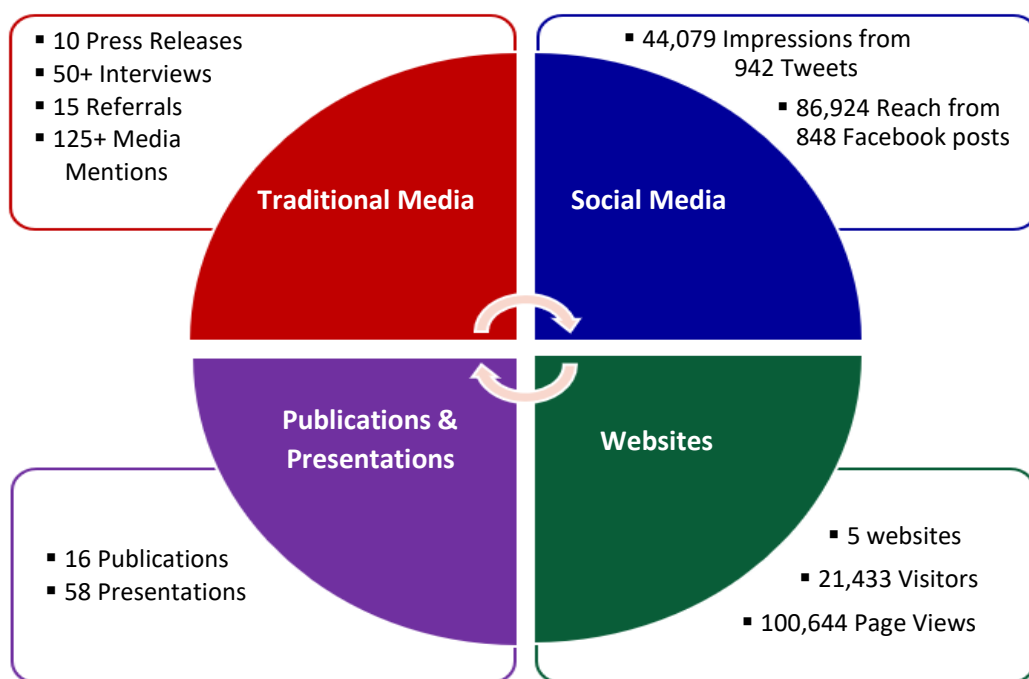
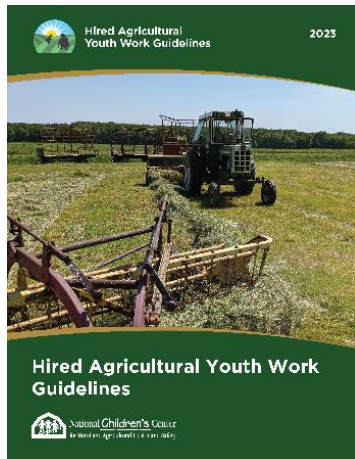


Figure 1. NCCRAHS Key Outputs for 2023

Communications: The National Children's Center Outreach Core (NOC) team keeps news media and stakeholders engaged in child agricultural safety and health through several

outlets. NOC facilitated more than 50 interviews with agriculture and mainstream media outlets and responded to several technical assistance requests. The outreach team also works to keep the scientific community and industry informed through [presentations](#), [publications](#), exhibits and [resources](#).



A key resource updated this year was the Hired Agricultural Youth Work Guidelines (HAYWG), previously known as the Safety Guidelines for Hired Adolescent Farm Workers. These guidelines, designed for employers and supervisors of hired youth, were updated based on the latest scientific evidence and best practices. The design was updated with modifiable skin tones and equipment colors to encourage use among various populations. Currently, the guidelines are available in a booklet, which also includes background and child development information, training tips, supervisor information and information and links to child labor regulations.

Another key resource used by NCCRAHS staff to inform projects and communications is AgInjuryNews.org (AIN). Launched in 2015 by NCCRAHS, AIN is a collection of agricultural-related injury and fatality news reports, which has evolved into an international collaborative hub. The AIN dataset has yielded over 24 peer-reviewed manuscripts, with 30 co-authors from 18 different organizations since 2018. AIN experienced a 20% increase in



new users and added 352 new incidents in the last year.

Dissemination Activities: The outreach team facilitates four dissemination activities to assess and evaluate strategies to encourage dissemination and implementation of child agricultural safety and health.

- **Learning Labs:** This activity leverages increased learning and retention resulting from engagement in interactive activities. With the Wisconsin EMS Association, NCCRAHS hosted a Tools of the Trade session as their opening keynote session. Over 350 fire and EMS personnel were introduced to interactive safety “tools” they could replicate and use to teach community members about farm safety and health.



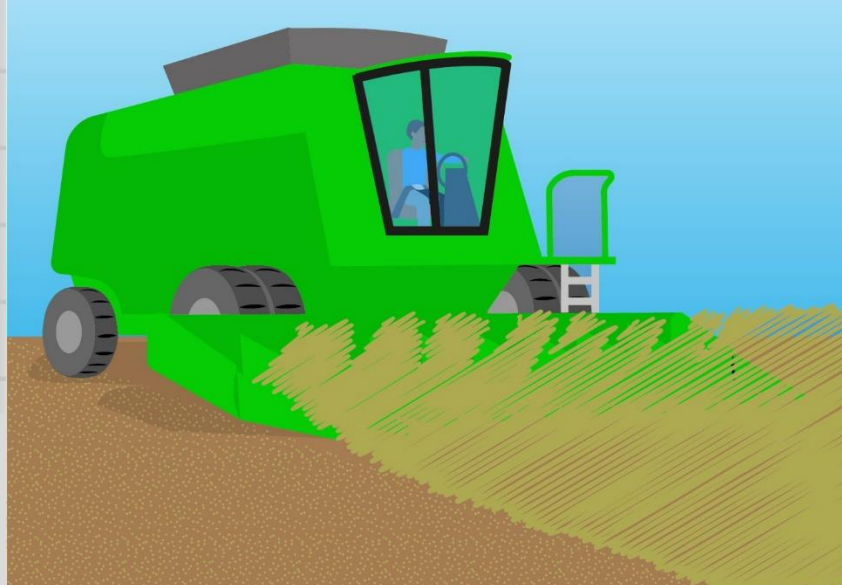
- *Wikipedia*: This activity increases the reach of child agricultural safety and health information to stakeholders by adding information to Wikipedia articles. To date, 55 safety edits have been completed on Wikipedia pages, including edits to tractor and skid steer articles.
- *Child Agricultural Safety and Health (CASH) Workshops*: The goal of these workshops is to educate participants on child agricultural safety and health, providing them with resources and tools they can use to promote safety within their communities. This year, NCCRAHS staff collaborated with FarmSafe Australia to conduct a CASH workshop at the 2022 World Safety Conference in Adelaide, Australia.
- *Storytelling*: This project seeks to convey child agricultural injury prevention messages by having participants [share their stories](#). Initial work has begun on a new story, which will feature a mother who lost her son in a gasoline explosion.



Childhood Agricultural Safety Network (CASN): CASN is an international coalition of organizations that work together to help keep children safe on the farm. The network is managed by NOC with guidance and assistance from the [CASN leadership team](#), which consists of 6 CASN members external to NCCRAHS. CASN has grown to 237 members and uses the [CASN online community](#) as its primary communication tool.

- *Collaboration and networking* were facilitated through the online community as well as a virtual meeting in February, participation in two think tanks to discuss development of a national action plan for child ag safety and health in July and August, and an in-person CASN meeting held in Florida in June.
- *Campaigns*: The ATV/UTV campaign resulted in a 101% increase in traffic to the [ATV/UTV campaign webpage](#) and distribution of hundreds of campaign resources. Lawn mower safety was selected as the next campaign topic with collected resources currently under review by content experts.
- *Survey*: A survey was conducted with CASN members to gather information on the interests, priorities and needs of CASN members to help plan for future activities and assess member satisfaction.





Section 3: Research Core

Assessing Impact of Traumatic Injury News

Bryan Weichelt, PhD, Marshfield Clinic Research Institute

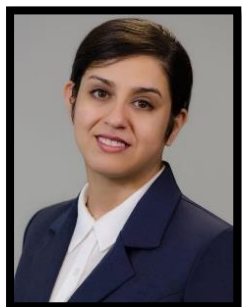


This project assesses change in farm parents and farm educators' knowledge, attitudes, and behavioral intentions (KAB) towards agricultural safety after exposing parents and educators to news reports of childhood agricultural injury. Following recruitment through online social media, respondents will complete a pre-test survey to determine baseline levels of KAB towards agricultural injury. Following the survey, half will read childhood agricultural injury news reports and half control articles on overall child health. They will then complete an assignment regarding the content of these reports once per week for 4 weeks. Following the intervention, participants will complete a post-test survey to measure changes in KAB. Additional follow-ups 6 and 12 months post participation will identify any lasting effects of the intervention.

A one-year follow-up surveys for farm parents have been completed. We continue to make progress with an analysis and write-up of farm parents' trust in science and news media using farm parents' initial responses and 1-year follow-up data. We are continuing to recruit agricultural educator group through the intervention.

Capabilities of Youth Operating ATVs

Farzaneh Khorsandi, PhD, University of California, Davis



All-terrain vehicle (ATV) crashes are one of the leading causes of injury and death among youth in the agriculture industry. The long-term goal of this project is to provide empirical evidence of physical and ergonomic factors that may put youth at risk of injury or death while operating utility ATVs on farms. This study will provide critical evidence to encourage, facilitate, and guide recommendations and public policies regarding youth operating ATVs for agricultural work. These goals will be achieved by a) identifying potential strengths and anthropometric discrepancies between the requirements for operating utility ATVs and the physical

characteristics and strength of youths of varying ages and height percentiles; b) updating existing guidelines and future resources regarding the required physical capabilities of youth to safely operate utility ATVs; and c) encourage, facilitate, and guide industry and organizational recommendations and public policies regarding youth operating ATVs for agricultural work by developing an "Action Plan for Guidelines on Youth Operating ATVs". This project performed studies to assess reachability of controls and field of vision for youth operating ATVs. Findings included that many youth are not able to properly reach all ATV controls. Youth are also not able to activate all controls due to size. Additionally, the field of vision when driving is restricted due to size. These project results were presented at national and international conferences, including ASABE, ISAHS, ASHCA, and NOIRS. Finally, we developed a virtual ATV riding simulator. We are currently developing an ATV riding simulator (physical) to evaluate the mental capabilities of youth riding ATVs as well as an ATV-fitting phone Application (App) as a decision support tool to help parents and employers decide the appropriate ATV fit for youth.

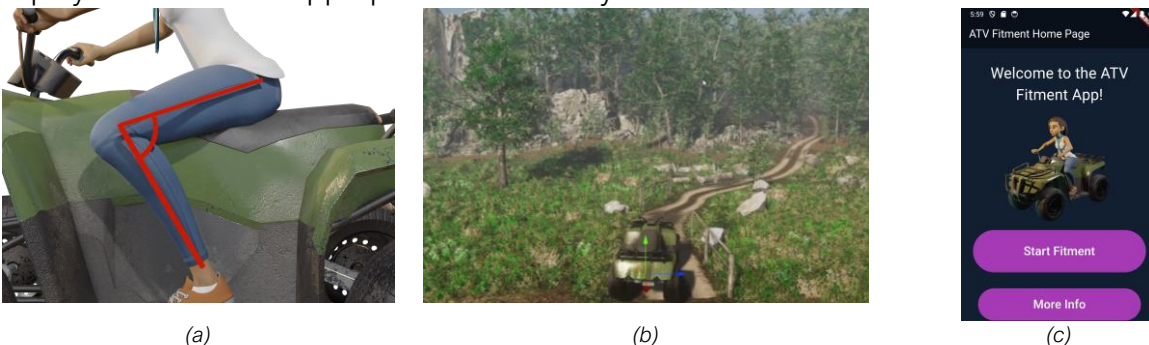


Figure 1. (a) One of the 11 reach evaluation criteria for riding ATV: Upper leg angle, (b) ATV riding simulator screen, (c) Screenshot of ATV fitting App.

Farm Adolescent and Adult Mental Health

Josie Rudolphi, PhD, University of Illinois Urbana-Champaign



There is converging evidence agricultural work contributes to poor mental health; however, the mental health experience of youth on farms is unknown. The results from this study will inform targeted programming and policies that improve the mental health of farm youth.

This project uses a multi-modality, innovative series of studies to examine the mental health of youth on farms, including identifying the prevalence of common mental health conditions and stressors among farm adolescents and their parents and consider the association between family members. This study will test a novel method to surveil farm youth mental health and provide insight into the shared experiences of farm families to identify vulnerable members to provide new knowledge about the mental health status of farm youth and inform the needs for continued surveillance and future intervention.

The research team has been active in disseminating results of the first two years of the study to audiences of interest. In the last year we have presented at regional, national and international conferences, including the International Society for Agricultural Safety and Health (Tampa, Florida), the BeSafe Conference (Dublin, Ireland), and the Midwest Regional Agricultural Safety and Health Conference (Cedar Rapids, Iowa). The enthusiasm and interest in the project have been overwhelming. Major results from the past year of data analysis include a noticeable increase in the proportion of participating families (adolescents and adults) that met the criteria for more serious anxiety and depression symptoms (see image below). For example, among farm parents, the proportion of respondents that met the criteria for none/mild symptoms of depression decreased from 40% to only 20%. The proportion of respondents who met the criteria for mild and moderate increased by approximately 10% each (See Figure 1). Adolescent depression results were nearly identical to those of adults (Figure 2).

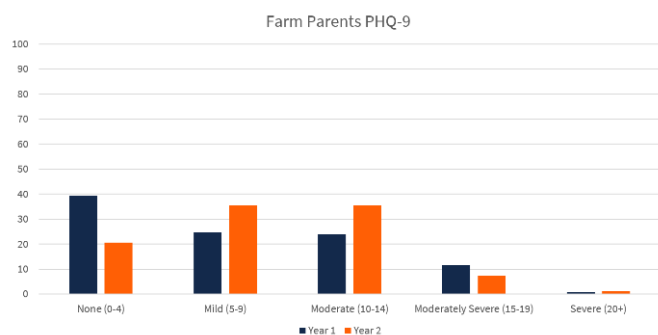


Figure 1. Proportion of farm parents meeting criteria for none, mild, moderate, moderately severe, and severe symptoms of depression (PHQ-9).

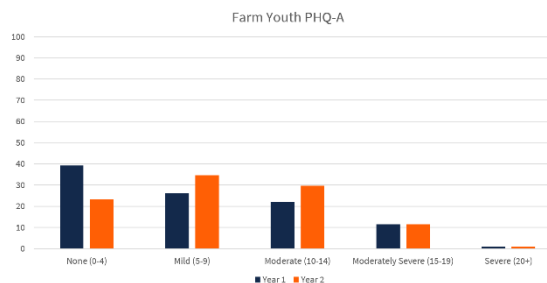


Figure 2. Proportion of farm adolescents meeting criteria for none, mild, moderate, moderately severe, and severe symptoms of depression (PHQ-A).

Adoption of Agricultural Youth Work Guidelines: Identifying Motivators and Barriers for Use

Andrea Swenson, PhD, Marshfield Clinic Research Institute



A prominent risk factor for youth injuries and fatalities is performing work that does not match their developmental capabilities. Agricultural Youth Work Guidelines (AYWG) are a set of voluntary, evidence-based decision-making tools for supervisors and parents to use to reduce the mismatch between youth developmental capabilities and agricultural task requirements. Guided by principles of The Reasoned Action Approach, this study aims to understand how different motivators and barriers relate

to the uptake of AYWG in agricultural populations to increase adoption of safety practices by supervisors and parents, thereby reducing agricultural-related injuries and fatalities in youth.

Thirty-nine organizations who conduct outreach to agricultural communities were interviewed for the project. Interview data was analyzed by a team of coders and several motivators and barriers for using AYWG were revealed. Organizations mentioned using trusted sources, incentivizing the use of AYWG, the repetition and ease of information,

compliance-driven philosophies, fear of injuries and fatalities, and adults wanting to protect children were motivators for organizations and individuals to use the guidelines. However, there were several barriers respondents pointed to which limited use and ability for individuals to adopt AYWG in everyday practice. These barriers included: (a) accessibility of information, (b) reception of information, (c) lack of policies guiding implementation and enforcement, (d) amount of information, (e) time, and (f) lack of fear of injuries. Findings from the interviews were used to develop a survey for adults supervising youth in agricultural settings. Data collection is currently in progress.

Linking Childcare to Farm Safety

Florence Becot, PhD, Marshfield Clinic Research Institute

Shoshanah Inwood, PhD, The Ohio State University



One of the most effective strategies to prevent incidents among non-working farm children is through their supervision by an adult off the worksite. As such, farm safety experts have aimed to encourage childcare use through educational programming aimed at changing parents' knowledge and attitudes around dangers on the farm and best practices. While evidence dating back to the

1980s identifies childcare as a challenge for farm parents, current farm safety research and interventions seldom consider how farm parents' lived-realities with childcare may intersect with their ability to use it and how their decisions intersect with farm safety. Through an environmental scan of farm programs and resources, interviews with key informants, focus groups and photovoice activities, and a representative survey of farm parents, this project will lead to an understanding of the range of social, cultural, political, and economic factors that shape farm parents' childcare decisions and the ways in which farm parents factor farm safety when making these decisions.

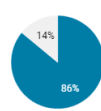
In year 3, we continued our analysis of the focus groups with 67 women raising children on farms and 33 women participating in the photovoice activity with a focus on the factors that shape the use of childcare as a farm safety strategy. While previous research has emphasized farm parents' knowledge and preferences as playing a key role in shaping farm safety decisions, we find that factors outside of farm parents' control (i.e. availability and cost of childcare, availability and willingness of family and friends to help) consistently play a major role in farm safety decisions.

We also deployed the farm household survey which 860 responses from 47 states. Survey preliminary findings reveal similar patterns from those from the qualitative phase. For example, 86% of the respondents take their children in the

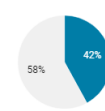
The stresses and challenges in raising children on farms

A nationwide survey of 860 farm and ranch families conducted from January to March 2023 highlighted the child care struggles U.S. farm families face.

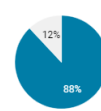
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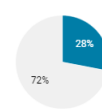
Take children onto active farm worksites due to lack of child care.



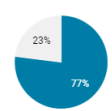
Report that family and friends are too busy to help with child care.



Report that stress and anxiety have increased since children arrived.



Decreased work hours or stopped working on the farm to care for children.



Report lack of child care affects ability to get farm work done.

active farm worksite due to lack of childcare while 88% reported that their levels of stress and anxiety has increased since the arrival of the children. We engaged in a number of outreach activities including publication of articles in the [Conversation](#) and [CDC NIOSH Science Blog](#), research briefings for legislators, presentations for farm groups, and media interviews. Research activities also included a published article on the [methodological and ethical implications of conducting a farm safety photovoice activity](#) and one about the [integration of children and childcare in farm programing](#).

Surveillance of Medically Attended Injuries

Jeff VanWormer, PhD, Marshfield Clinic Research Institute



There is no deadlier work for children and adolescents in the United States than farming, yet little is known about recent trends in agricultural risks because there is no comprehensive surveillance system of agricultural injuries. The purpose of this project is to establish a surveillance system of medically attended agricultural injuries among children and adolescents who reside on farms in north-central Wisconsin. Multi-year epidemiologic trends in medically attended agricultural injuries, as well as population subgroups at highest risk for agricultural injury, will be estimated.

The study cohort has been assembled, including linkages between farm residence and MCHS patient records. Medical records have been extracted to identify (and chart validate) agricultural injuries. The study cohort has also been expanded to include non-farm children and adolescents. The most recent 5-year injury trends analyses are completed, including comparisons to the non-farm group, as outlined in a manuscript that was published in *Frontiers in Public Health*. The study cohort was also used in several ancillary projects, including a summer internship project that examined the burden of diseases of despair between farm vs. non-farm youth and adult household members (see comparisons of suicidality in Figure 1).

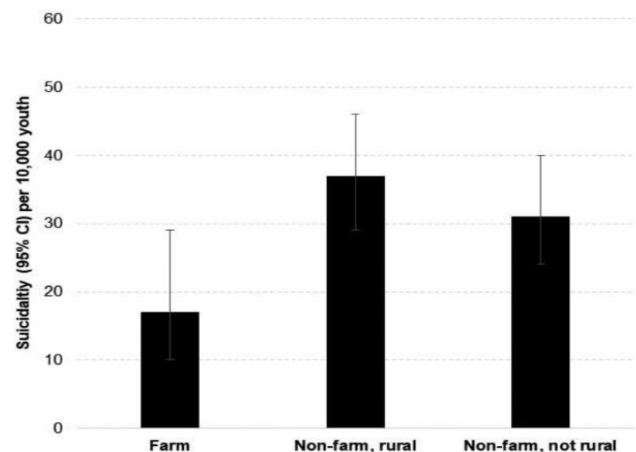


Figure 1. Estimated period prevalence (2017–2022) of medically attended suicidality in north-central Wisconsin youth age 5–17 years who live on farms, as well non-farm youth who live in rural and non-rural areas.

The project team recently received State data from the Wisconsin Trauma Care Registry and Wisconsin Ambulance Runs Data and are in the process of linking it to our study cohort. This will be used to soon conduct an updated trends analysis of agricultural injuries.

As cohort data continues to accrue, we are also planning to compare injury trends between key subgroups (e.g., gender, age, insurance status).

Farm Kid Paradox

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Though raising children on farms is thought to improve work ethic, enhance problem-solving skills, and is known to strengthen a child's immune system, farming is one of the most hazardous industries in the U.S., with about 33 children seriously injured on farms and ranches each day. Referred to as the "Farm Kid Paradox," researchers have explored these risks and benefits separately, creating a gap between farm parents and safety training/information. In this project, researchers at Marshfield and Kansas State University are working with both farm parents and professionals who deal in safety to bridge this gap and combine safety information with messaging that includes the benefits of farm life. This project will unite farm/ranch parents and professionals who deal in safety around a common goal: reducing risks and enhancing the benefits to children who live and work around livestock.

The Farm Kid Paradox research team completed recruitment and initial in-depth interviews with all our research participants. Thematic analysis of initial interviews has been completed for the dairy parent and beef parent groups. Data collected via interviews with safety professionals is currently being coded for qualitative analysis. Additionally, twenty dairy farm parents and sixteen livestock safety experts completed the free-listing activity. These free-lists will undergo quantitative and comparative analyses to reveal the most culturally salient risks and benefits perceived by the two groups as well as commonalities and disparities in risk/benefit perception. We also developed a modified pile sort instrument capable of capturing how farm parents and safety professionals variably evaluate the risks and benefits of different child-livestock interactions.

Findings from beef farm parents revealed that most beef farm parents are motivated to raise their children around livestock out of a desire to raise the kind of child that will be a good person in society. Additional findings with beef farm parents and existing literature and ethnographic experience seek to understand how a large-scale transition to cultured beef might impact the health and safety of conventional beef operations. One key finding is that dairy farm parents held the position that their children would be exposed to risk whether or not they engaged in child-livestock interactions—risk for them is a fact of life for rural as well as urban children. On the other hand, parents understood the benefits of child-livestock interactions to be particular to working with livestock.

2023 Peer-Reviewed Publications

Becot F, Inwood S, Buchanan E. Giving rural farm women voice: Ethical and methodological deliberations of navigating competing tensions in a photovoice project. *Journal of Bioethical Inquiry*. 2023. 20(2):249-263. doi:10.1007/s11673-023-10261-8

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VanWormer JJ, Alicea G, Weichelt BP, Berg RL, Sundaram ME. COVID-19 vaccine coverage disparities in rural and farm children. *Vaccine*. 2023. 41(1):68-75. doi: 10.1016/j.vaccine.2022.11.015

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