



Assessing Engagement, Needs, and Resources to Promote Child and Youth Safety on the Farm and Ranch

Cheryl L. Beseler, Andrea V. R. Swenson, Christopher A. Wanat, Whitney Pennington, Marsha Cheyney, Cassandra Peltier, Alma Jordan & Marsha Salzwedel

To cite this article: Cheryl L. Beseler, Andrea V. R. Swenson, Christopher A. Wanat, Whitney Pennington, Marsha Cheyney, Cassandra Peltier, Alma Jordan & Marsha Salzwedel (2025) Assessing Engagement, Needs, and Resources to Promote Child and Youth Safety on the Farm and Ranch, *Journal of Agromedicine*, 30:4, 754-764, DOI: [10.1080/1059924X.2025.2517844](https://doi.org/10.1080/1059924X.2025.2517844)

To link to this article: <https://doi.org/10.1080/1059924X.2025.2517844>



Published online: 13 Jun 2025.



Submit your article to this journal [↗](#)



Article views: 80



View related articles [↗](#)



View Crossmark data [↗](#)



Assessing Engagement, Needs, and Resources to Promote Child and Youth Safety on the Farm and Ranch

Cheryl L. Beseler^a, Andrea V. R. Swenson^b, Christopher A. Wanat^b, Whitney Pennington^c, Marsha Cheyney^d, Cassandra Peltier^b, Alma Jordan^e, and Marsha Salzwedel^b

^aDepartment of Environmental, Agricultural and Occupational Health, University of Nebraska Medical Center, Omaha, NE, USA; ^bNational Children's Center for Rural and Agricultural Health and Safety, Marshfield Clinic Research Institute, Marshfield, WI, USA; ^cDepartment of Environmental & Radiological Health Sciences, High Plains Intermountain Center for Agricultural Health and Safety, Colorado State University, Fort Collins, CO, USA; ^dGreat Plains Center for Agricultural Health, University of Iowa, Iowa City, IA, USA; ^eAgriKids, Ashbawn, Clorballis, Julianstown, Co Meath, Ireland

ABSTRACT

The Childhood Agricultural Safety Network (CASN) is a coalition of diverse individuals and organizations working together to safeguard children in agriculture. This study assessed CASN memberships' interests, priorities, and use of resources to help plan future activities and assess member engagement and satisfaction. We electronically surveyed 201 CASN members; 60 responded (29.85%). Respondents were asked about their affiliations, participation in agricultural associations, past and future level of engagement, agricultural safety interests, use of agricultural resources, and future activities of interest. Latent class analysis (LCA) was used to understand heterogeneity in the CASN members based on their selected interests. Classes were then tested in logistic regression models to determine how they might differ based on how much of a problem they perceived injury in youth to be, their level of past and future engagement, and their years with CASN. Odds ratios and 95% confidence intervals were used to estimate effect sizes. Exploratory factor analysis was used to assess the patterns of use of resources by respondents. Frequencies were reported for use of resources and future interests. Two groups of CASN members were identified based on reported topics of interest. Specialists (58.9%) were focused on the use of motorized vehicles and roadways. The second group, Generalists (41.1%), had more diverse interests. The two groups differed on how seriously they viewed the problem of agricultural injury in youth (Generalist vs Specialist: OR = 6.27; 1.56, 25.2) and their interest in participating in future CASN activities (Generalist vs. Specialist: OR = 8.75; 1.76, 43.5). The use of 11 resources fell into two patterns. Nearly half of respondents reported current use of the Ag Youth Work Guidelines, Ag Injury News, and the Child Ag Injury Prevention Workshop. CASN is heterogeneous in their agricultural interests around youth safety and their use of resources. In planning future campaigns, it is important to meet the needs of both groups, with activities planned around ATV/UTV and roadway safety and keeping young children out of the worksite, as well as specific topics of concern such as manure ponds, skid steers, and agritourism.

KEYWORDS

Agricultural injury;
exploratory factor analysis;
injury prevention;
latent class analysis;
youth injuries

Introduction

In 2018, a report from the U.S. Government Accountability Office (GAO)¹ found more children die working in agriculture than in all other occupations combined. Although injury and fatality data are scarce due to limited surveillance,² GAO data from 2003 to 2016 showed children working in agriculture experienced more than half of the 452 work-related fatalities among children. Youth working in agriculture have high rates of non-fatal injuries as well as a high incidence of

injuries among youth bystanders on farms (youth not working, but present in worksites).³ Additionally, child labor regulations continue to change. Since 2021, 28 states have proposed legislation to loosen child labor laws.⁴ In a response to this trend, 14 states have introduced legislation to strengthen child labor laws.⁴ Although work has advantages for youth, including children's physical and mental well-being, working in agriculture comes with high risks due to being a hazardous environment.⁵ Therefore, it is important that

resources are available to protect youth when engaged in agricultural activities, especially in a changing policy environment where proactive safety education is critical to protecting these younger workers.

In 1996, the National Children's Center for Rural and Agricultural Health and Safety (NCCRAHS) was established to "enhance the health and safety of all children exposed to hazards associated with agricultural work and rural environments."⁶ Partnerships have been an essential pillar of NCCRAHS since the beginning of the Center.⁷ Established by NCCRAHS in 1999, the Childhood Agricultural Safety Network (CASN)⁸ is a coalition of diverse individuals and organizations representing governmental, non-governmental, academic, and industry partners, with a mission to "set a vision and provide leadership and coordination of childhood agricultural injury prevention efforts in a manner that is both geographically and ethnically diverse".⁶ CASN has grown through increased awareness, diverse activities, and management. In 2014, NCCRAHS focused on expanding partnerships using the socio-ecological model applied to agriculture.² One project focused on strengthening organizational capacity to safeguard youth working in agriculture, including an aim to grow and support CASN. CASN activities include virtual meetings and collaborative, multimedia campaigns (most recently on lawnmowers). An annual in-person meeting for CASN members is held during a major agricultural health and safety conference. This work continues and has led to the creation of an online community in which members can create their own profiles, create posts, and find and share resources.

CASN has grown since 1999, when it started with three members, to include a range of agricultural organizations and a diverse group of members, with over 250 members at the time of writing. Several efforts were used to increase membership and participation in CASN, including in-person meetings, webinars, virtual meetings, management of an online community, and periodic evaluation activities. Members reported a general satisfaction with the effectiveness of the organization and reported many benefits of participating in the work of the organization, as measured by the

Internal Coalition Effectiveness survey used to evaluate organizational performance of CASN in 2014.⁹ In December of 2019, a needs assessment was undertaken by NCCRAHS to better understand where efforts were needed to build capacity to address gaps in resources and emerging issues facing farm families and their youth working on farms. The needs assessment included members of CASN as well as organizations involved in agricultural health and safety that were not members of CASN at the time. The primary reported needs were related to all-terrain vehicle (ATV) safety, especially an emphasis on not allowing extra riders and keeping young children out of the worksite. The need for injury surveillance in youth was also mentioned as an unmet need.¹⁰ In 2022, a CASN leadership team was formed to guide the selection of topics and content for CASN campaigns, identify potential collaborators, engage in strategic planning for the network, and engage members in the CASN Online Community.

Given the growth of the network and potential for diverse needs of members within the network, we surveyed CASN membership in 2023 to evaluate the interests, priorities, and use of resources by members to help plan future activities as well as assess member engagement and satisfaction. Since the work of CASN focuses on the safety and health of farm and ranch youth, the views of the members reflect what they see as emerging issues and ongoing needs in farm families. This information can be useful for anyone working within agricultural communities. It also provides information on what resources are most useful in these efforts. Our primary evaluation questions were: (1) do heterogeneous subgroups exist in the CASN membership based on interests and concerns? (2) what resources were being utilized by the CASN membership? and (3) what future activities were members interested in for purposes of planning future campaigns?

Methods

Procedures

The survey was administered using REDCap, and responses were collected electronically. Similar to the 2014 evaluation, only CASN

members were recruited for participation in this study. This is a noted difference in recruitment from the 2019 survey, which recruited CASN members along with a curated list of other organizations critical to youth agricultural health and safety. While the 2019 survey was valuable to guide youth agricultural health and safety initiatives, the survey did not address several of the evaluative questions the leadership team had related to current CASN functioning. Therefore, a new evaluation survey was developed, reviewed, and piloted by the CASN leadership team. The survey was distributed through the CASN online member portal, via email, and promoted during a virtual CASN meeting. Three reminders were sent through the online community and email, with the third reminder using final reminder language. There were 201 members of CASN at the time of the survey, and a total of 60 members completed the survey (29.85% response rate). The survey took 5 to 10 minutes to complete, and responses were anonymous. Individuals who completed the survey were entered into a drawing for gift cards (one \$100 gift card and four \$25 gift cards). All procedures were approved by the Marshfield Clinic Research Institute's Institutional Review Board.

Respondents were asked about their professional affiliation, what organizations they participated in, their level of engagement in childhood ag safety and health in the past 2 years, their interest in working in this area in the next 3 to 5 years, how long they had individually been involved with CASN, and how long their organization had been involved with CASN. They were also asked about their use of resources in their prevention work. The 10 resources included Agricultural Youth Work Guidelines (AYWG); Ag Injury News; Agritourism Guidelines; ATV/utility task vehicle (UTV) safety posters, trifold, and campaign materials; Child Ag Injury Fact Sheets (CAI); Child Ag Injury Prevention Workshop (CASH Workshop); Child Ag Injury (CAI) News Clippings; Keep Kids Away from Tractors (KKAT) posters; Media Guidelines; Safe Play Areas on Farm Guidelines; and the Safety in Agriculture for Youth (SAY) Clearinghouse.

Analysis: engagement with safety and health topics

An analysis of the data was conducted to better understand the interests of the 60 CASN community members who responded to the survey. Previously, we used descriptive statistics to assess interest in certain safety topics. This assumed the group was homogeneous, which may not be true since different types of organizations may have differing priorities depending on their mission. To assess whether there were subgroups of individuals interested in the same topics, a latent class analysis (LCA) was done on the question asking "Over the next two years, CASN will more deeply engage in some of these topics. Which of the following do YOU want to be involved with?". The response categories were interested, not interested, and unsure for each of the 16 topics. Due to the small sample size and unsure being equivalent to expressing no interest, these responses were recoded to 0=not interested or unsure and 1=interested. These items were used in the latent class analysis in those who responded to each of the 16 topics.

Latent class analysis identifies subgroups in an otherwise similar group of individuals using binary response variables. MPlus version 8.5¹¹ was used for this analysis. The sample size required is a matter of how well the subgroups separate out and this can be seen in samples as small as 50.¹² We used robust maximum likelihood with 100 random starts and a logit link function. Model fit statistics such as the log likelihood and Bayesian Information Criterion, where smaller values indicate a better fit, and entropy, where higher values indicate acceptable separation of groups, are the criteria most used to assess fit.¹³ We used these measures to identify the optimal number of classes. There are limitations with using LCA on small sample sizes such as reduced accuracy in class assignment, convergence issues, unstable parameter estimates, detection of small classes, reliability of fit statistics, and limitations in generalizability. To combat these problems, we examined the misclassification rates and convergence output. In our LCA sample, the cell frequencies for each item were well populated with no sparse cells. We also used 100 random starts, 10 final

stage optimization steps, and 20 iterations in the initial stage of optimization to decrease the likelihood of experiencing these issues and produce more reliable estimates.

The paired Wilcoxon signed rank test was used to test whether the item frequencies in each class differed from one another. An effect size with 95% bootstrapped confidence interval¹⁴ was calculated using the *rstatix* package in R Statistical Software (v4.3.3; R Core Team 2021). Chi-square tests were used to compare the classes for each of the items of interest. Results were considered statistically significant at $p < .003$ after using Bonferroni adjustment due to making 16 comparisons.

Using logistic regression analysis, we calculated odds ratios for the latent classes and (1) seeing youth injuries and fatalities as a major problem, (2) frequency of involvement with CASN in past 2 years, (3) predicted involvement in CASN in the next 3 to 5 years, and (4) years involved in CASN either as an individual or as an organization. The variable for youth injuries being a major problem was coded as 1 if the respondent said it was a major problem and 0 if the respondent said it was somewhat of a problem, a minor problem, or was unsure. Frequency of past involvement was coded as an ordinal variable with rarely/never/unsure = 1, sporadically = 2, occasionally = 3 and frequently = 4. Future involvement in CASN was coded as a 1 if the respondent was very interested and 0 otherwise. Years in CASN was a categorical variable ranging from one to four for <1 year, 1–2 years, 3–5 years, and >5 years. The question asking about years of involvement of the organization had an unsure option for respondents who did not know how long their organization had been a CASN member. We reported the odds ratios and 95% confidence interval for the odds ratio. Odds ratios > 1 indicated a higher odds of being in the Generalist class compared to the Specialist class for a given characteristic. These analyses were conducted in SAS version 9.4 (SAS Institute, Cary, NC).

Reported use of child ag safety and health resources

We descriptively report on the use of resources by CASN respondents. Participants were asked which

of 11 resources they (1) used previously, (2) currently use, (3) will use in the future, (4) were unsure of use, and (5) were unfamiliar with the resource. The assumption was that there exists an order to the use of these resources from having used them in the past to being unfamiliar with the resource. Exploratory factor analysis was used to assess what resources tended to be used together. We tested 1-, 2-, and 3-factor models and assessed model fit using the chi-square test ($p\text{-value} > .05$ desirable), Tucker-Lewis Index ($TLI \geq 0.95$), Comparative Fit Index ($CFI \geq 0.95$), and the Root Mean Squared Error of Approximation ($RMSEA < 0.05$). These analyses were also conducted in MPlus version 8.5.¹⁰

Results

Participants

Of the 201 members of CASN at the time of the survey, 60 members completed the survey (29.85% response rate). Complete data was available on 51 of the participants. Of respondents, 40% had participated in CASN activities for more than 5 years, and 48.3% of their organizations had also been involved with CASN for more than 5 years. Representatives from agricultural health and safety organizations were nearly half of the sample; followed by academic and extension specialists; other groups included farm owners, Farm Bureau members, farm cooperatives, equipment manufacturers, and vocational agricultural educators; and extension educators and 4-H (Table 1). Professional agricultural associations represented included the International Society for Agricultural Safety and Health (ISASH) at 40% (Table 1). ISASH was the single leading association from which members were recruited, but it has also been the conference where the annual in-person meeting occurs each year. Members are often engaged with several associations, as suggested by the fact that 92 associations are represented among 60 respondents.

Organizational perception of problem and engagement in prevention of agricultural injuries in youth

Of respondents, two-thirds reported their organization viewed agriculture-related injuries and fatalities in children and youth as a major

Table 1. Characteristics of the 60 childhood agricultural safety network (CASN) members who responded to the survey, 2023.

Characteristic	n (%)
Affiliations of CASN respondents	
Agricultural Health and Safety Organizations	29 (48.3)
Academic and Extension Specialists	15 (25.0)
Farm owners, Farm Bureau and Farm Cooperative, Equipment manufacturers, and vocational agricultural educators	9 (15.0)
Extension educators and 4-H	7 (11.7)
Agricultural Safety and Health Professional Associations represented	
International Society for Agricultural Safety and Health (ISASH)	24 (40.0)
Agricultural Safety and Health Council of America (ASHCA)	8 (13.3)
American Society of Agricultural and Biological Engineers (ASABE)	7 (11.7)
National Institutes for Occupational Safety and Health Agricultural Centers	15 (25.0)
Other National and International organizations	38 (63.3)
How does your organization perceive agriculture-related injuries and fatalities to children and youth?	
Major problem	40 (66.7)
Somewhat of a problem	16 (26.7)
Minor, not a problem, unsure	4 (6.67)
Frequency of organization engaging in child ag safety and health activities or projects in the past 2 years	
Rarely, never or unsure	7 (11.7)
Sporadically (once or twice a year)	14 (23.3)
Occasionally (every few months)	13 (21.7)
Frequently (at least once per month)	15 (25.0)
All the time	11 (18.3)
Overall, how would you characterize your organization's interest level in participating in child ag safety and health efforts in the next 3 to 5 years?	
Unsure if interested or somewhat interested	18 (30.0)
Very interested	42 (70.0)
How long have you as an individual participated in CASN?	
<1 year	14 (23.3)
1–2 years	12 (20.0)
3–5 years	10 (16.7)
>5 years	24 (40.0)
How long has your organization participated in CASN?	
<1 year	8 (13.3)
1–2 years	7 (11.7)
3–5 years	5 (8.33)
>5 years	29 (48.3)
Unsure	11 (18.3)

problem, and 93.4% said it was somewhat of a problem or a major problem (Table 1). Additionally, 26 of 60 respondents (43.3%) reported their organizations actively worked all the time or frequently on reducing injuries and fatalities in youth (Table 1). When asked how interested the respondent's organization was in participating in child agricultural safety and health efforts in the next 3 to 5 years, 98% responded somewhat or very interested.

Identifying groups based on engagement with specific safety and health topics

A two-class model best fit the data consisting of binary responses to involvement in 16 safety and health topics in 56 respondents with complete data on this question (Table 2). The classification into the two groups was nearly perfect at greater than

99%. The Bayesian Information Criterion was lowest and entropy highest for the two-class model. The smallest class size in the 3-class solution contained only six individuals. In the 2-class solution, class 1 was composed of 33 participants (58.9%), and class 2 had 23 participants (41.1%). Class 1 was labeled "Specialists," because they expressed a narrower interest in safety and health topics compared to Class 2, who were labeled as "Generalists", who showed an interest in every topic asked about.

Table 3 shows the frequencies of participants falling into either the Specialists or Generalists classes based on a certain topic of interest. Overall, greater than 80% of the respondents said extra riders on farm equipment, ATV/UTV safety, and roadway safety were the topics of greatest interest. Specialists scored higher on keeping young children out of the worksite, extra riders

on tractors or equipment, ATVs/UTVs, and roadway safety than the Generalists, who scored higher than the Specialist class on the remaining items. The greatest differences were seen on manure safety, where 71% of Generalists found this topic to be very interesting, compared to only 29% of Specialists. This suggests a group that is most interested in youth using a motorized vehicle by either being an extra rider, using an ATV or a UTV, roadway safety, and generally keeping youth out of the agricultural workplace. The second group, Generalists, showed a broader interest in agricultural issues, but most differences were found by situational hazards such as manure ponds, water bodies, skid steers, and tractor operations. This group was more interested in policy advocacy. The group differences were statistically significant ($p = .005$), with a large effect size of 0.71 (95% CI 0.39, 0.87). At the individual topic level, ten chi-square values were significant and six were not after adjusting for multiple testing.

The results showed two classes fit the data well; however, there were items (see Table 3) where the lines crossed in the two groups (Figure 1). Five of

the sixteen items showed crossover in Figure 1. Interests in and concern about allowing extra riders on tractors and other equipment; ATV/UTV, lawnmower, and roadway safety; and public policy or advocacy did not differ among the two classes. These topics do not discriminate between the two latent classes in the CASN membership. Although the lines cross, which means these are not considered a complete separation of the classes, the results are robust for a sample size of only 56.

In terms of associations and roles, the Generalists were more likely to be involved in a US Center for Agricultural Safety and Health (Ag Center) ($p = .04$) compared to Specialists. It is expected that agricultural health and safety experts would be involved in a broader scope of agricultural activities that many other groups. This can be seen in the types of organizations represented by these groups. Affiliations of those in the Specialists category included farm bureaus, agricultural cooperatives, and equipment suppliers. These affiliations were unique to the Specialist category and not found among the Generalists.

Table 2. Fit statistics for the latent class analysis of 16 safety topics of possible interest to CASN respondents, 2023.

Classes	-LL	BIC	entropy	Smallest latent class posterior probability
1	-526	1085	NA	NA
2	-449	1032	0.979	0.411
3	-426	1054	0.957	0.107

LL, log likelihood; BIC, Bayesian Information Criterion.

Table 3. Percentage of respondents reporting interest in the topic overall and by class based on latent class analysis in 56 CASN survey participants, 2023.

Item	Item Description	% Interested (n = 56)	% Specialists (n = 33)	% Generalists (n = 23)	p-value*
1	Keep young children out of worksite	71.4	52.5	47.5	.12
2	Extra riders on tractors/equipment	85.7	52.1	47.9	.01
3	Tractor operations	69.6	41.0	59.0	<.0001
4	ATVs/UTVs	85.7	52.1	47.9	.01
5	Skid Steers	62.5	37.1	62.9	<.0001
6	Animals	78.6	47.7	52.3	.001
7	Grain/confined spaces	69.6	41.0	59.0	<.0001
8	Manure Safety	55.4	29.0	71.0	<.0001
9	Water Safety	58.9	39.4	60.6	.0004
10	Agritourism	42.9	33.3	66.7	.0007
11	Community Gardens	37.5	38.1	61.9	.01
12	Injury Surveillance	76.8	46.5	53.5	.0006
13	Supervision	73.2	43.9	56.1	.0002
14	Lawnmower Safety	73.2	43.9	56.1	.0002
15	Roadway Safety	82.1	54.3	45.7	.14
16	Public Policy/Advocacy	50.0	42.9	57.1	.01

*Chi-square test for differences between two classes; bolded values are statistically significant at $p < .003$ after adjustment for multiple testing.

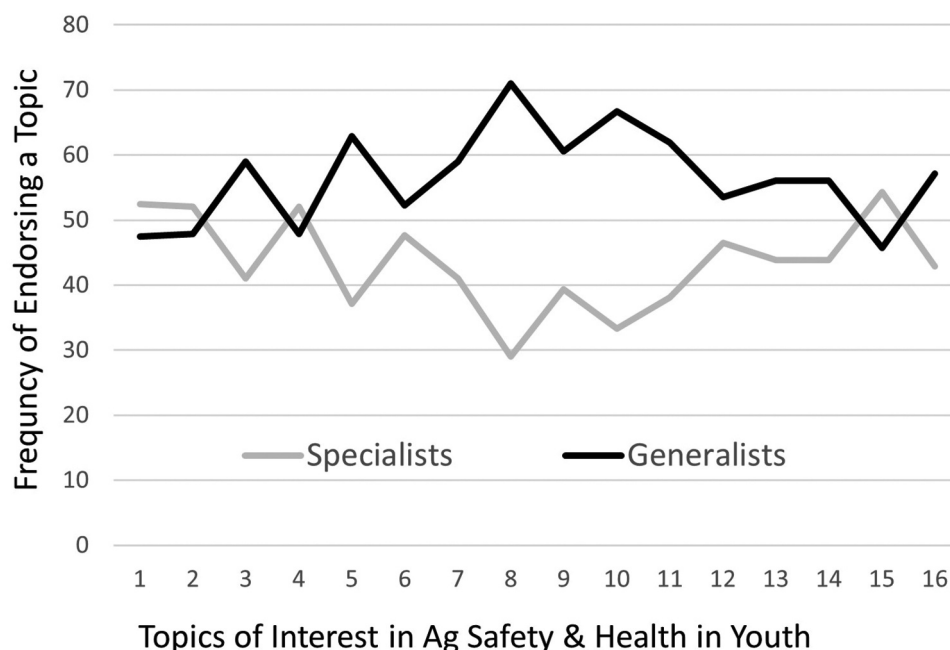


Figure 1. Latent classes identified in topics of interest in 56 CASN members, 2023.

Using the class status as the outcome variable, a logistic regression analysis was conducted to assess factors that were associated with the two classes. Participants who reported their organization perceived agriculture-related injuries and fatalities in children and youth to be a major problem had a six-fold higher odds of being in the Generalist class rather than in the Specialist class, who were more likely to see it as somewhat of a problem, a minor problem, not a problem, or were unsure whether it was a problem (Table 4). Having a greater interest in participating in child agricultural safety and health efforts in the next 3 to 5 years had an eight-fold higher odds of being in the Generalist class compared to being in the Specialist class. There was an elevated, but non-significant association, between class membership and the reported frequency of engaging in child agricultural safety and health activities in the past 2 years and the length of time either the individual

or their organization had been involved with CASN.

Use of resources

Participants were asked which of 11 resources they (1) used previously, (2) currently use, (3) will use in the future, (4) were unsure of use, and (5) were unfamiliar with the resource (Figure 2). The variable was used as an ordinal variable in an exploratory factor analysis to assess what resources were used together. Two primary groups of resources were identified with an excellent fit to the data ($\chi^2 = 29.5$, p -value = .24; RMSEA = 0.057, CFI = 0.989, TLI = 0.975). Ag Youth Work Guidelines (formerly NAGCAT), Safe Play Areas on Farms Guidelines, Child Ag Injury Fact Sheets, Child Ag Injury News Clippings, Keep Kids Away from Tractors Posters, and Child Ag Injury Prevention Workshop formed a group suggesting the same

Table 4. Association of being in the generalist class compared to Specialist class and respondent engagement characteristics in 56 respondents*, 2023.

Survey question	Odds Ratio	95% Confidence Interval
Thought youth ag injury was major problem	6.27	1.56, 25.2
Involved in youth ag activities in past 2–3 years	1.54	0.98, 2.41
Very interested in being involved in next 3–5 years	8.75	1.76, 43.5
Years a CASN member at the individual level	1.24	0.79, 1.95
Years organization has been a CASN member*	1.93	1.07, 3.46

*46 were included in this analysis after removing those who reported “unsure”.

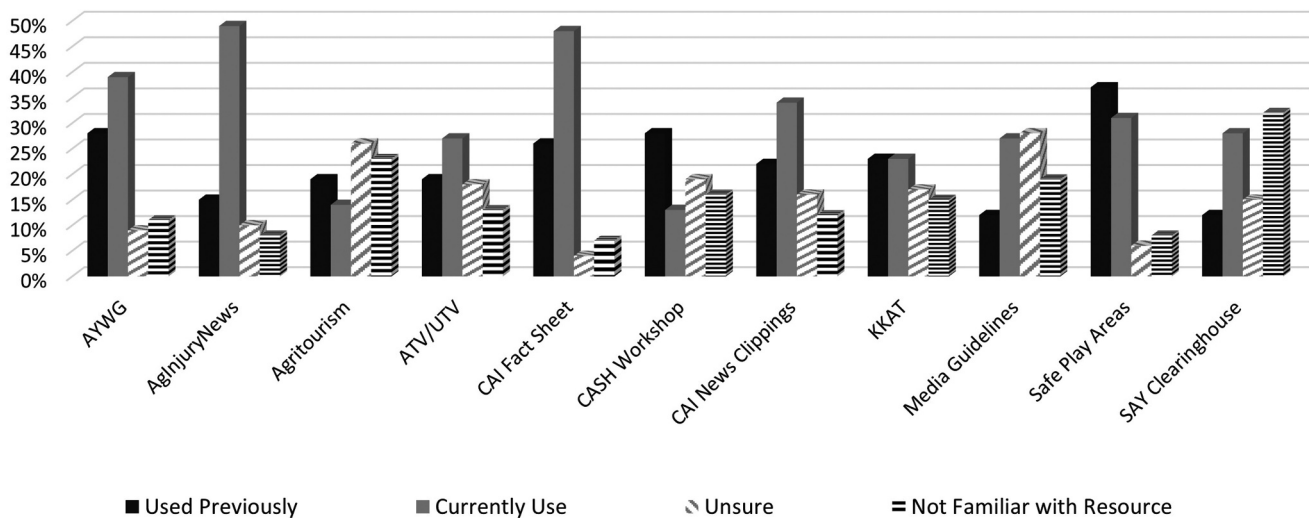


Figure 2. Reported use of resources by CASN members, 2023.

participants tended to use these materials together. A second, smaller group was using Agritourism guidelines, Ag Injury News, and the SAY Clearinghouse. The correlation between these two groups was small to moderate at 0.27.

CASN members interest in future activities

CASN members responded overwhelmingly that promoting existing campaigns was an activity they planned to engage in during the next 2 years

(Figure 3). There was also strong support for offering webinars and workshops, as well as continuing to improve and connect on the CASN online community. These results differed from the 2019 response related to future activities, where networking opportunities and co-branding of resources were the second and third most frequently reported future activities of interest. Respondents strongly agree that supporting existing campaigns is of central importance in the future work of CASN.

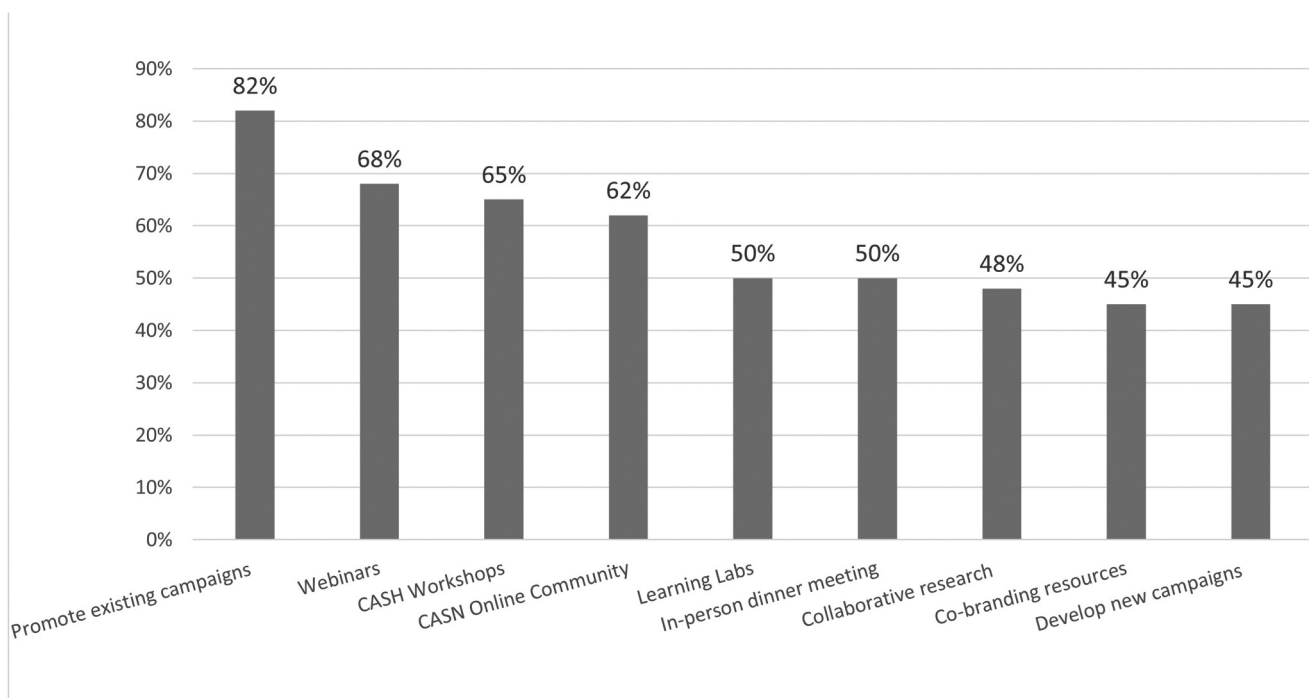


Figure 3. CASN members' interest in child agricultural safety and health activities, 2023.

Discussion

CASN is a coalition of diverse individuals and organizations working together to safeguard children in agriculture. As a collaborative coalition, it is important for CASN to provide resources to meet the safety and health needs of organizations and individuals working to safeguard youth on farms and ranches. This study evaluated CASN memberships' interests, priorities, and use of resources to help plan future activities as well as member engagement and satisfaction. There were two groups identified that could be partially separated by their topics of interest. The Specialists group was focused on specific aspects of youth health and safety such as use of motorized vehicles and roadways. The second group had more diverse interests. These two groups differed by individuals primarily being associated with either an Ag Center or being a farm bureau, cooperative, or equipment supplier. The two groups differed on how seriously they viewed the problem of agriculture injury in children and youth and their interest in participating in future CASN activities. The Generalist group was more likely to report injuries in youth working in agriculture were a major problem compared to the Specialist group. Maybe the understanding of the many hazards by the Generalists results in this association. Respondents who report a greater number of safety concerns to youth indicates a higher degree of understanding of the risks. They may have a broader understanding of agricultural environments than the Specialists. The Generalists were more committed to future work in preventing injuries in farm youth, probably due to understanding the hazards. In planning for future campaigns and events, it is important to consider the needs of both groups. The Specialists can be retained by focusing on vehicle and roadway safety. Future campaigns and webinars could focus on the interests of these two different groups. The two groups identified did not differ on public policy or advocacy, potentially highlighting a need for common interest given the changes in child labor laws in the U.S. at the time of data collection.

The most frequently used resources were the Child Ag Injury News Clippings, Ag Injury News, and the Ag Youth Work Guidelines, which provide general information on youth working in agriculture and reported incidents at their

worksites. Two groups of resources tended to be used together without much overlap. The group using the fewest resources were interested in agritourism, injury news stories, and an educational resource database, the SAY Clearinghouse. The second group used more of all the different resources. Similar to the interests in the sample, resource use was also heterogeneous in terms of what resources were used together.

Due to differences in the sampling frame, we were unable to make many direct comparisons to the survey conducted in 2019; however, several of the same concerns of youth working in agriculture were seen in this survey. In 2019, CASN surveyed 95 individuals representing agricultural health and safety organizations within the United States and received 50 responses, a response rate of 53%, which is higher than the 30% response rate in the current survey. In the questions that were identical, two-thirds of 2023 respondents reported their organization viewed agriculture-related injuries and fatalities in children and youth as a major problem, and 93.4% said it was somewhat of a problem or a major problem. In 2019, 84% said it was somewhat of a problem or a major problem, an increase of 11% in the 4-year period. ATV/UTV safety, allowing extra riders on machines and equipment, and keeping young children out of the worksite remained of high interest. Additionally, roadway safety was a greater concern in the more recent survey than observed previously. CASN has addressed the ATV/UTV concern by launching an ATV/UTV safety campaign in 2022. Resource materials were posted on the CASN website, and the materials were promoted at various farm event venues. These efforts continue, and the need to reduce ATV/UTV incidents remains. When asked how interested the respondent's organization was in participating in child agricultural safety and health efforts in the next 3 to 5 years, 98% responded somewhat or very interested. This is an increase of 23% from the 80% response in 2019. Additionally, 26 of 60 respondents (43.3%) reported their organizations actively worked all the time or frequently on reducing injuries and fatalities in youth. In 2019, this percentage was 31%, an increase of nearly 40%. The 2019 survey was administered to CASN

members and other organizations, whereas the 2023 survey was only administered to CASN members. This change in administration likely drives the increase in proportional survey participation from active occupational safety and health organizations compared to 2019, which likely drives the increases in concern, interest, and future participation.

The resources currently being used most often did not change between 2019 and 2023. The Child Ag Injury Fact Sheet was 60% in 2019 and 48% in 2023, Ag Injury News was 54% in 2019 and 49% in 2023, and the Ag Youth work Guidelines was 52% in 2019 and only 39% in 2023. Overall, current use of resources decreased in the most frequently used resources. The addition of the SAY Clearinghouse might explain some of this decrease; however, the decrease warrants further investigation.

The current evaluation of CASN has limitations due to the relatively low response rate. We cannot know whether the responses analyzed here represent the general views of the CASN membership due to the 30% response rate. It is likely that those who responded are also those who are most actively engaged with CASN. Similar to the 2014 evaluation,⁹ the purpose of this survey was to identify information specific to CASN in order to improve the network. Since the purpose of this survey was to provide feedback for organizational decision-making, generalizability is not relevant to the purpose of evaluative efforts. An avenue for future evaluative work with CASN could focus on members who are not as engaged or who were engaged at one point but are no longer engaged.

Additionally, there are limitations with using an LCA with a small sample size although our model fit indicators appear to show an acceptable model fit with accurate classification. Limitations also apply to using factor analysis with small samples. Future surveys might want to conduct a targeted, stratified sampling of CASN representatives from organizations actively engaged in youth farm safety aiming for representation from all sectors. New approaches to improving response rates might involve conducting the survey in-person at conferences, promoting the survey at online and annual meetings, and increasing incentives.

This study assessed different interests and needs within CASN. This information will be used to

identify priorities for CASN moving forward and provides insights into the membership of a dynamic network. The CASN organization is a network that brings together individuals and organizations working to prevent injury in youth working on farms and ranches. The diverse expertise in the organization allows it to produce relevant and informative resources, conduct outreach to those working with youth in an agricultural setting, and collaborate to build partnerships. This needs assessment identified a large group of experts who have specific interests in the field of agricultural health and safety in youth working in agriculture. This information can be used to better meet the needs of these CASN members and their organizations.

Data availability statement

Data is available from the corresponding author upon request.

Disclosure statement

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

Funding

The Central States Center for Agricultural Safety and Health (CS-CASH) was supported by the CDC/NIOSH under Cooperative Agreement U54 OH010162; the National Children's Center for Rural and Agricultural Health and Safety was supported through CDC/NIOSH Cooperative Agreement U54 OH009568; the High Plains Intermountain Center for Agricultural Health and Safety was supported through CDC/NIOSH Cooperative Agreement U54 OH008085; GPCAH as Great Plains Center for Agricultural Health was supported through CDC/NIOSH Cooperative Agreement U54 OH007548

ORCID

Cheryl L. Beseler  <http://orcid.org/0000-0002-2135-3839>

References

1. Working Children: Federal Injury Data And Compliance Strategies Could Be Strengthened. *United States Government Accountability Office GAO*. Report to Congressional Requesters. gao-19-26. 2018. <https://www.gao.gov/assets/gao-19-26.pdf>.
2. Lee BC, Salzwedel MA. Safeguarding youth from agricultural injury and illness: the United States'

- experience. *Front Public Health*. 2023;11:1048576. doi: [10.3389/fpubh.2023.1048576](https://doi.org/10.3389/fpubh.2023.1048576).
3. Hendricks KJ, Hendricks SA, Layne LA. A national overview of youth and injury trends on U.S. Farms, 2001-2014. *J Agric Saf Health*. 2021;27(3):121-134. doi: [10.13031/jash.14473](https://doi.org/10.13031/jash.14473).
 4. Sherer J, Mast N. Child labor laws are under attack in states across the country: amid increasing child labor violations, lawmakers must act to strengthen standards. *Economic Policy Institute*. <https://www.epi.org/publication/child-labor-laws-under-attack/>. 2023.
 5. Bendixsen C. A farm kid paradox. *J Anthropol N Am*. 2019;22(2):139-142. doi: [10.1002/nad.12118](https://doi.org/10.1002/nad.12118).
 6. National Children's Center for Rural and Agricultural Health and Safety (NCCRAHS). About us. <https://www.marshfieldresearch.org/nccrahs/about-the-center>. 2024.
 7. Raygor AD, Lindberg SM. In *Pursuit of a 2020 Vision: Evaluation Findings of the National Initiative for Childhood Agricultural Injury Prevention*. Madison, WI: University of Wisconsin Population Health Institute; 2018.
 8. Childhood Agricultural Safety Network (CASN). CASN online community. About. <https://www.childag-safety.org/about>. 2024.
 9. Cramer ME, Wendl MJ. Children's agricultural safety network: evaluating organizational effectiveness and impacts. *J Agromedicine*. 2015;20(2):105-115. doi: [10.1080/1059924X.2015.1010067](https://doi.org/10.1080/1059924X.2015.1010067).
 10. Salzwedel M, Weichelt BP, Burke R, Lee BC. Needs assessment survey for enhancing United States child agricultural injury prevention capacity: brief report. *Front Public Health*. 2023;11:1059024. doi: [10.3389/fpubh.2023.1059024](https://doi.org/10.3389/fpubh.2023.1059024). Accessed March 27, 2023.
 11. Muthén LK, Muthén BO. *Mplus User's Guide*. 8th ed. Los Angeles, CA: Muthén & Muthén; 1998-2017.
 12. Muthén B, Muthén LK. Integrating person-centered and variable-centered analyses: growth mixture modeling with latent trajectory classes. *Alcohol Clin Exp Res*. 2000;24(6):882-891. doi: [10.1111/j.1530-0277.2000.tb02070.x](https://doi.org/10.1111/j.1530-0277.2000.tb02070.x).
 13. Killian MO, Cimino AN, Weller BE, Hyun SC. A systematic review of latent variable mixture modeling research in social work journals. *J evidence-Based Soc Work*. 2019;16(2):192-210. doi: [10.1080/23761407.2019.1577783](https://doi.org/10.1080/23761407.2019.1577783).
 14. Tomczak M, Tomczak E. The need to report effect size estimates revisited. An overview of some recommended measures of effect size. *Trends In Sport Sci*. 2014;1(21):19-25.