Non-fatal All-Terrain Vehicle Injuries to Youth on Farms in the U.S., 2001

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Abstract:

The National Institute for Occupational Safety and Health (NIOSH), in an on-going effort to address the issue of injuries to youth on farms in the U.S., collaborated with the U.S. Department of Agriculture (USDA) to complete the 2001 Childhood Agricultural Injury Survey (CAIS). These data, collected via telephone surveys, provide information on non-fatal injuries which occurred to youth under 20 years of age on U.S. farms during 2001. The injuries include both occupational and non-occupational incidents.

The CAIS data indicate that there were approximately 1,653,317 farms in operation in the U.S. during the 2001 calendar year. An estimated 1,075,759 youth lived on these farms and 400,213 youth were hired by the farm operator to work on the operation during 2001. Of the hired and household youth, 450,397 (31%) had operated an all-terrain vehicle (ATV) in 2001.

An estimated 22,648 non-fatal injuries occurred on U.S. farms to youth less than 20 years of age during 2001. Approximately 10% of these injuries (2,246) were the result of ATV use. The majority of these ATV injuries (1,668, 74%) occurred to youth identified as members of the household. Males accounted for 1,471 (65%) of the ATV injuries. The majority of the injuries were to youth aged 10 to 15 years (1,611, 72%). Injury rates for specific sub-categories of the data will also be presented. Furthermore, this study will provide insight into types of ATV related injuries and other factors which may impact injury rates.

These data will provide researchers, injury prevention practitioners and farm families with more detailed information on non-fatal injury events involving ATVs on U.S. farms. This information may be used to assess the need for further study of ATV injuries and safety. In addition, these data may be used to direct health and safety education related to ATV use on farms.

Introduction:

The all-terrain vehicle (ATV) has become a popular machine for both recreational and occupational use. This popularity appears to be increasing with time. From 1997 to 2001 the U.S. Consumer Product Safety Commission (CPSC) reported an increase in ATV ownership of 39.5% and an increase in riding hours of 44.8% (Levenson, 2003). Most of this usage has been for recreation, but "with the development of a large number of special attachments, the ATV has become a practical work machine." (Tormoehlen and Shelden, 1996). As ATV use increases on U.S. farms, they may represent an added hazard to an already hazardous environment for youth (Rivara, 1997). The purpose of this research is to overview injuries to youth as a result of ATV use on the farm in 2001.

ATVs were introduced in the 1970s and were first used primarily as recreational vehicles (Brown et al., 2002; Toermoehlen and Sheldon, 1996). ATVs are typically three- and four-wheel motorized off-road vehicles similar to motorcycles in their method of control and riding position (Rodgers and Adler, 2001; Rodgers, 1999; Cvijanovich et al., 2001). The engine displacements on these machines typically range between 50 and 800cc and the weight of the machines is normally between 100 and 600 pounds. The evolution of ATVs has made them practical working vehicles, a fact that has been recognized in the agricultural sector (Baker and Lee, 1994). Today, "these powerful machines are commonly used for farming, hunting, and recreation by people of all ages" (Brown, et al., 2002).

As ATV popularity and utility increased, injuries to riders increased. In the period between 1983 and 1985 alone there was an estimated increase in injuries treated in emergency departments of over 230% (32,100 to 106,000) (Rodgers and Adler, 2001;

Rodgers, 1999). In 1985, this translated to about 5,580 injuries for every 100,000 ATVs in use in the U.S. (Rodgers and Adler, 2001). A number of these injuries were to youth less than 16 years of age. In fact, 40% of all ATV fatalities in 1986 were to youth in this age group (Cvijanovich et al., 2001). The injury rates indicated that ATVs were a significant public health hazard to children and youth (Cjivanovich et al., 2001).

In 1988, a ten-year consent decree between the CPSC and the major manufacturers of ATVs was developed and implemented (Rodgers and Adler, 2001; Cvijanovich et al., 2001; Rodgers, 1999; Tormoehlen and Sheldon, 1996). This decree intended to reduce injuries through the development of safety training programs and guidelines for ATV use. The use guidelines included agreements to halt the production of three-wheeled ATVs and to place age restrictions on ATV use by engine displacement size. Although the decree expired in 1998, the practices established by the decree were intended to continue.

After the consent decree was signed, ATV-related injuries dropped to about 50,000 in 1993 and remained constant at this level through 1997 (Rodgers, 1999). However, follow-up research indicated that youth under 16 years of age were still accounting for 40 to 50% of all injuries (Cvijanovich et al., 2001). In addition, the period from 1997 to 2001 saw an increase in estimated injuries from 54,700 to 111,700 (Levenson, 2003). This was an increase of 104% with only a 45% increase in driving hours and a 40% increase in the number of ATVs. In 2001, youth under 16 years of age sustained over 25% of all ATV related injuries and showed a greater than 50% increase from 1997 in the number of injuries they incurred.

Although informative, this information is not specific to agriculture, and the literature suggests that ATVs are increasingly being used in agricultural environments (Tormoehlen and Sheldon, 1996). The National Institute for Occupational Safety and Health (NIOSH) included ATV exposure and injury questions on the 2001 Childhood Agricultural Injury Survey (CAIS) to address this issue.

Methods:

The 2001 CAIS data were obtained for NIOSH by the United States Department of Agriculture (USDA), National Agricultural Statistics Service (NASS). Using the USDA 1997 Census of Agriculture as a sampling frame, 50,000 farm households nationwide were selected for inclusion in the survey. A subsample of 25,000 farms was asked additional questions regarding adult occupational injuries and ATV ownership and use on farms. Of the 50,000 farms, 39,344 were contacted, with an adjusted response rate of 78% (30,744 completed). The adjusted response rate for the adult injury survey sample was much higher at 98% (16,456 respondents) of the 16,644 farms contacted.

The data collected for the 2001 CAIS include demographic information on the farm and members of the farm household. Demographic data were also collected on youth under 20 years of age working on the farm. Data were collected on all non-fatal injuries occurring to youth during the 2001 calendar year. On the adult survey, data regarding ATV ownership and ATV characteristics were collected.

Injuries were defined as an event occurring on the farm operation that resulted in at least four hours of restricted activity or required the individual to seek professional medical attention. Both work and non-work injuries to youth living, working, or visiting

the farm (excluding laborers hired by contractors working on the farm) were included in these data. A work-related injury was defined as any injury that occurred while performing activities that had a direct impact on the farming operation as a business, regardless of whether the activity was performed for pay. Injuries incurred by a non-working youth as the result of another individual's work were not defined as work-related.

Estimates for injuries, ATV use on farms, and demographic data were obtained using the SAS Surveymeans procedure (SAS, 1999). All results were benchmarked to the 1997 Census of Agriculture. The type of injury, body part injured, and a narrative description of the injury were collected for all reported injuries. Standardized coding of the source of injury and event was completed by the authors per the Occupational Injury and Illness Classification System (OIICS) (BLS, 1992). Injury rates per 1,000 household youth ATV operators were calculated as the estimated number of injuries, divided by the estimated number of household youth who operated ATVs in 2001 from the CAIS. All confidence intervals (CI) are reported at the 95% level.

Results:

The 2001 CAIS data indicate that there were approximately 1,653,317 ($CI_{95\%}$ ±11,919) farms in operation in the U.S. There were an estimated 1,075,759 ($CI_{95\%}$ ±13,446) youth living on these farms and 400,213 ($CI_{95\%}$ ±25,253) youth were hired by the farm operator to work on the operation during 2001. Thirty-one percent (450,397) of these household and hired youth had operated an ATV in 2001.

ATV Ownership and Usage

In 2001, there were an estimated 857,665 ($CI_{95\%}$ ±25,215) ATVs in use on farms operating in the U.S., with the range encompassing 0 to 19 ATVs on a single farm. The average was 0.5 ATVs per farm, with 643,348 ($CI_{95\%}$ ±15,966) reporting ownership of 1 or more ATVs. Of these 643,348 farms, 24% (156,012, $CI_{95\%}$ ±9,413) reported having more than one ATV. The rates of ownership held true regardless of farm type. The West region had the highest rate of ATV ownership per farm with 680 ($CI_{95\%}$ ±35) ATVs for every 1,000 farms while the Northeast had the lowest ownership at 402 ($CI_{95\%}$ ±26) ATVs for every 1,000 farms (Table 1).

Table 1

ATVs per Farm by Region, U.S., 2001

Regions	Estimated ATVs*		Estimated Farms		ATVs per 1,000 Farms	
	Estimate	$CI_{95\%}$	Estimate	$CI_{95\%}$	Rate	$CI_{95\%}$
Northeast	37,888	±2,358	94,310	±1,313	402	±26
South	331,648	±18,010	689,012	±8,212	481	±27
Midwest	336,432	±15,749	647,037	±8,005	520	±25
West	151,696	±7,609	222,958	±2,971	680	±35
Total	857,665	±25,215	1,653,317	±11,919	519	±16

*Estimates may not add due to rounding.

In 2001, 60% (516,988, $CI_{95\%}$ ±11,496) of the ATVs on U.S. farms were used 10 or more times per month by someone on the farm. Fifty-five percent (198,345, $CI_{95\%}$ ±9,659) of ATVs on crop operations and 64% (314,664, $CI_{95\%}$ ±11,255) of ATVs on livestock operations were typically used 10 or more times per month, while 3,979 ($CI_{95\%}$ ±1,607) ATVs were used 10 or more times per month on farms of unknown type. Regionally, usage varied in a pattern similar to ownership (Table 1). Sixty-two percent (93,417, $CI_{95\%}$ ±3,004) of ATVs in the West region were used 10 or more times per

month compared to 56% (21,154, $CI_{95\%}$ ±1,067) of ATVs in the Northeast region, with the South and Midwest at 61% (201,034, $CI_{95\%}$ ±8,009) and 60% (201,384, $CI_{95\%}$ ±7,656) respectively.

Household Youth ATV Exposure

Of the 1,075,759 youth under 20 years of age who lived on farms in the U.S. during 2001, 36% (384,666, $CI_{95\%}$ ±8,832) operated an ATV. Almost half (180,224, $CI_{95\%}$ ± 6,444) of the household youth operating ATVs were living on farms located in the Midwest region, while the Northeast region showed significantly less operators per 1,000 household youth (Table 2). The percentage (36%) of operators was the same for both crop and livestock operations. The majority of household youth operating ATVs were male (228,141, $CI_{95\%}$ ±7,569, 59%), which represented 42% of all male household youth. Thirteen percent (48,545, $CI_{95\%}$ ±3,866) of youth between the ages of 0 and 9 years operated an ATV. This percentage increased to 51% (151,133, $CI_{95\%}$ ±6,448) for youth aged 16 to 19. As seen in Table 3, 62% (30,022, $CI_{95\%}$ ±3,063) of all household youth ATV operators less than 10 years of age were male; this proportion dropped to 59% in the two older age groups.

Table 2

Estimated Household Youth ATV Operators by Region, U.S., 2001

Regions	HH Youth Operators*		Total HH Youth*		Operators per 1,000 HH Youth	
	Estimate	$CI_{95\%}$	Estimate	$CI_{95\%}$	Rate	$CI_{95\%}$
Northeast	19,425	±943	79,334	±3,418	245	±16
South	123,284	±5,568	332,151	±15,092	371	±24
Midwest	180,224	±6,444	506,236	±18,502	356	±18
West	61,733	±2,138	158,039	±3,585	391	±21
Total	384,666	±8,832	1,075,759	±13,446	358	±12

*Estimates may not add due to rounding.
HH - household

Table 3

Estimated Household Youth ATV Operators by Age and Sex, U.S., 2001

	Operators*		Total HH Youth*	
All HH Youth	Estimate	$CI_{95\%}$	Estimate	$CI_{95\%}$
0-9	48,545	±3,866	362,268	±8,730
10-15	184,988	±6,964	391,965	±8,849
16-19	151,133	±6,448	297,800	±8,248
Unknown	0		23,727	
Total	**384,666**	**±8,832**	**1,075,759**	**±13,446**
Male HH Youth				
0-9	30,022	±3,063	178,127	±6,860
10-15	108,514	±5,584	200,323	±7,156
16-19	89,605	±5,133	157,230	±6,513
Unknown	0		2,702	
Total	**228,141**	**±7,569**	**538,382**	**±9,214**
Female HH Youth				
0-9	18,524	±2,432	184,141	±6,983
10-15	76,473	±4,724	191,642	±7,021
16-19	61,436	±4,310	140,446	±6,221
Unknown	0		3,161	
Total	**156,433**	**±6,513**	**519,389**	**±9,210**

*Estimates may not add due to rounding.

HH - household

Hired Youth ATV Exposure

Of the 400,213 youth under 20 years of age who were hired to perform work on U.S. farms in 2001, an estimated 65,731 ($CI_{95\%}$ ±4,150, 16%) operated an ATV. On crop operations 14% (27,731, $CI_{95\%}$ ±2,855) of hired youth operated ATVs, while 19% (37,908, $CI_{95\%}$ ±3,312) of youth on livestock operations operated ATVs. The rate of ATV operation for hired males was 188 ($CI_{95\%}$ ±13) per 1,000 hired youth, while 125 ($CI_{95\%}$ ±32) per 1,000 hired females operated ATVs. Seventy-six percent of all hired youth operating ATVs were 16 to 19 years of age.

ATV Injury Characteristics

Of the estimated 22,648 ($CI_{95\%}$ ±662) total injuries on U.S. farms to youth in 2001, there were an estimated 2,246 ($CI_{95\%}$ ±818) non-fatal injuries involving ATVs. In general, there were approximately 3 ($CI_{95\%}$ ±1.1) injuries for every 1,000 ATVs found on U.S. farms in 2001. Almost half (1,032, $CI_{95\%}$ ±586, 46%) of the injuries occurred on farms situated in the Midwest region, which was slightly higher than the percentage of ATVs found in this region (39%, Table 1). Over half (1,301, $CI_{95\%}$ ±619, 58%) of ATV injuries to youth occurred on livestock operations. This proportion was consistent with the proportion of ATVs found on these farms.

The majority of ATV related injuries occurred to males (1,471, $CI_{95\%}$ ±673, 65%) and to youth 10 to 15 years of age (1,611, $CI_{95\%}$ ±724, 72%). Of the 1,405 ($CI_{95\%}$ ±376) injury cases with a known ATV engine size, 960 ($CI_{95\%}$ ±355, 68%) incidents involved youth under 16 years of age on ATVs with engines of 201cc or greater; in 80% (628, $CI_{95\%}$ ±390) of the incidents, these youth were the operators of the ATV. Youth under 16 incurred 408 ($CI_{95\%}$ ±311, 29%) injuries on ATVs with engines of 301cc or greater.

In 88% (1,978, $CI_{95\%}$ ±284) of all on farm ATV related non-fatal injuries, the injured youth was the operator of the ATV. All reported ATV injuries were to household youth (1,667, $CI_{95\%}$ ±711, 74%) and other relatives (579, $CI_{95\%}$ ±443, 26%). Less than half of the injured youth (947, $CI_{95\%}$ ±385, 42%) were wearing a helmet at the time of the incident, and only 18% (408, $CI_{95\%}$ ±367) of all the injured youth had completed an ATV training class. Eighty-three percent (1,862, $CI_{95\%}$ ±317) of ATV related injury incidents involved a four wheeled ATV. Over half (1,313, $CI_{95\%}$ ±338, 58%) of the injuries were

the result of recreational activities, while the rest of the injuries resulted from farm work or general transportation use.

Approximately 30% (682, $CI_{95\%}$ ±480) of all ATV-related injuries were to the head/face. In 377 ($CI_{95\%}$ ±311, 55%) of these injury events the youth was not wearing a helmet. Injuries to the shoulder/chest/back (478, $CI_{95\%}$ ±414, 21%) and injuries to multiple body parts (430, $CI_{95\%}$ ±363, 19%) were the next most commonly injured body parts from ATV incidents. Dislocations (635, $CI_{95\%}$ ±431, 28%) were the most common type of injury sustained in these incidents, followed by multiple injury types (365, $CI_{95\%}$ ±352, 16%) and sprains/strains/torn ligaments (362, $CI_{95\%}$ ±331, 16%).

ATV Injuries to Household Youth

In 2001 there were 1,667 ($CI_{95\%}$ ±711) ATV related injuries to household youth for an injury rate of 4 ($CI_{95\%}$ ±1.7) injuries for every 1,000 household youth who operated ATVs. Half (845, $CI_{95\%}$ ±534, 51%) of all ATV injuries to household youth occurred on farms in the Midwest region. Youth on livestock operations were injured at a rate of 5 ($CI_{95\%}$ ±2.6) injuries per 1,000 household youth who had operated ATVs (1,127, $CI_{95\%}$ ±586, 68%), while their counterparts on crop operations were injured at a rate of 3 ($CI_{95\%}$ ±2.4) per 1,000 youth (540, $CI_{95\%}$ ±426, 32%).

Males accounted for 69% (1,143, $CI_{95\%}$ ±587) of ATV injuries to household youth. The injury rate for household males who operated ATVs in 2001 was 5 ($CI_{95\%}$ ±2.6) injuries per 1,000 youth, while the rate for female household youth ATV operators (525, $CI_{95\%}$ ±418) was 3 ($CI_{95\%}$ ±2.4) injuries per 1,000 youth.

Of the 1,152 ($CI_{95\%}$ ±570) injuries to household youth where the ATV engine size was known, 997 ($CI_{95\%}$ ±339, 87%) occurred on ATVs with engine sizes ranging from

201cc to 400cc. Almost one-third (304, $CI_{95\%}$ ±284, 30%) of the injuries on these large ATVs were to youth under the age of 10. The household youth was the operator of the ATV in 88% (1,459, $CI_{95\%}$ ±465) of ATV injury events. In 628 ($CI_{95\%}$ ±389)(55% of events with a known engine size) incidents, the operator of a 201cc to 400cc ATV was a household youth less than 16 years of age.

Helmets were not commonly worn during these ATV injury events. A helmet was worn by the injured household youth in 619 ($CI_{95\%}$ ±316, 37%) of the events. Eighty-two percent (1,375, $CI_{95\%}$ ±374) of ATV-related injury incidents involved a four-wheeled ATV. Over half (970, $CI_{95\%}$ ±413, 58%) of the injuries were the result of recreational activities, while the rest of the injuries resulted from farm work or general transportation use.

Approximately 32% (538, $CI_{95\%}$ ±423) of all ATV-related injuries to household youth were to the head/face. In 346 ($CI_{95\%}$ ±308, 64%) of these injury events the youth was not wearing a helmet. Multiple injury events (365, $CI_{95\%}$ ±352, 22%) were the most common type of injury sustained in these incidents, followed by dislocations (324, $CI_{95\%}$ ±295, 19%).

Discussion:

As the prevalence of ATVs on farms increases, addressing the importance of ATV safety on farms for children increases. Whereas agriculture machinery, such as tractors, have been a major focus of farm safety research, the 2001 CAIS data indicated a need for research to also focus on ATV injuries. In 2001, 320 ($CI_{95\%}$ ±9) per 1,000 household youth operated a tractor while 358 ($CI_{95\%}$ ±12) per 1,000 household youth

operated an ATV (NIOSH, 2004). Among youth under 16 years of age, the rate of ATV operation was greater than the rate of tractor operation. Household youth under 10 years of age were 3 times more likely to operate an ATV (134 ($CI_{95\%}$ ±11) per 1,000 household youth) than a tractor (42 ($CI_{95\%}$ ±6) per 1,000 household youth). For household youth age 10 to 15, 48% operated an ATV while 40% operated a tractor in 2001. As age increased, the rate of ATV operation and the rate of tractor operation became more similar. In the oldest age group, tractor exposure was more prevalent with 582 ($CI_{95\%}$ ±28) per 1,000 household youth 16 to 19 years of age operating a tractor compared to 507 ($CI_{95\%}$ ±12) per 1,000 household youth who operated an ATV.

CPSC and the ATV industry collected data regarding ATV exposure and injuries in 2001 (Levenson, 2003). According to these data, the factors determining risk of injury from ATV use include; age, experience, use, and ATV size. CPSC data indicated a youth ATV injury rate of 5 injuries per 1,000 youth riders (operators and passengers). The rate for youth under 16 years of age was approximately 5 injuries per 1,000 youth riders while youth 16 to 18 years of age incurred 7 injuries per 1,000 youth riders. Although a rate for all youth on farms could not be calculated from CAIS data due to a lack of exposure information for visitors on farms, household rates were calculated. The overall household rate of 4 injuries per 1,000 household youth operating ATVs was similar to the CPSC rate. Overall, males were injured at a greater rate than females in both the CPSC and CAIS data.

Although ATVs with engines displacements of 200cc and greater are not intended for children and youth under 16 years of age, CPSC data showed 19,770 (65%) injuries to youth under 16 occurred to drivers of these adult sized ATVs (Levenson, 2003). Further

examination of age differences in injuries indicated that, for drivers, the greatest increase in injuries came to children 0 to 6 years of age. The 2001 CPSC data showed a 233% increase in ATV related operator injuries to this age group. CAIS data also indicated that youth in the younger age group were operating large ATVs. Of all the injury events for which engine size was recorded, 55% (628) of the injuries to youth under 16 occurred while these youth were operating ATVs of 201cc to 400cc. Clearly, the age restrictions suggested by the consent decree were not being followed in 2001.

CPSC data also suggested that experience and use contributed to injury events. CAIS data did not provide an equivalent measure with regard to injury events. However, only 18% (408) of the injured youth had completed an ATV training class. This indicator may have an influence similar to experience. In addition, the CPSC report concluded that greater usage increases the chance that an injury will occur, but reduces the risk per use (Levenson, 2003). According to CAIS data, 60% of all ATVs on farms in the U.S. were used 10 or more times per month. However, there is no clear way within the CAIS data to link these exposures to children and injury events. CAIS simply indicated that ATVs are used often on farms and operators are not likely to have been formally trained.

CAIS data provided information that is specific to farms. An item of interest is that the rate of injury to household youth operating ATVs on livestock operations was double that of crop operations, although ATV use was not significantly different. Preliminary analyses indicate that incidents on livestock operations are more often roll-over events, possibly due to the varied topographic characteristics of these farms. Also, CPSC data indicate that well over 90% of all ATV injuries were the result of recreational activities (Levenson, 2003), but on farms only 58% of injuries were the result of

recreational activities. Although CAIS data did not include information regarding the type of use for each ATV, the higher percentage of work-related injuries on farms may indicate that the farming community is moving more toward using ATVs for both work and recreation. These findings, together with the difference in injury rates for the oldest age groups, warrant further research.

Finally, the 2001 CAIS indicated that in 30% of all ATV injury events the head/face was injured. In 55% of these events the injured youth was not wearing a helmet. Household youth with head/face injuries were even less likely to be wearing a helmet when injured. It is clear that helmet use is an area that must be addressed with youth in the farming community. In addition, the large percentage of shoulder/chest/back injuries suggests that the use of chest protection should also be emphasized.

Limitations

CAIS data are likely to be subject to both recall and response bias. Data for injuries occurring in calendar year 2001 were collected in early 2002 meaning that some injuries may have occurred over 12 months prior to the survey. The respondent was asked to provide information on the more serious injuries only, which should have reduced recall bias; however, it is likely still an issue (Harel et al., 1994). The study was also subject to potential response bias because the injured party was not typically the respondent. Most respondents were the female head of the household. Comparisons to CPSC data do indicate that the responses obtained by CAIS are reasonable, but they do not verify the accuracy of individual responses. In addition, CAIS and CPSC are not directly

comparable due to variations in measurement and operationalization of individual variables.

Two limitations of CAIS data are found in the exposure and ownership data. First, while CPSC injury rates are calculated using exposure data for both operators and passengers, CAIS data only allow for exposure data to be calculated for operators. However, injury data is collected for both passengers and operators. Therefore, rates for ATV riders may be lower than reported. However, as noted in the results section, most of the injured youth were the operators of the ATV at the time of the incident. Another limitation of the 2001 CAIS data is that ATV use and ownership was collected as a subsample of the survey of youth injuries. Therefore, different weights were used to determine the estimates reported in this study which may impact the accuracy of these estimates.

Finally, CAIS injury data are limited by the small number of events available for analysis. For example, estimates for injuries to household youth by age and sex are unreportable due to high relative standard errors associated with these estimates.

Conclusions:

The 2001 CAIS data show that ATV related injuries to youth are prevalent on farms. The characteristics of these ATV injuries indicate that most should not have occurred if the original 1998 consent decree had produced the desired changes in behavior related to ATV use. Injury rates for youth under 16 are relatively high, and younger youth continue to be injured on adult sized ATVs. In addition, very few injured youth on farms have completed safety training courses. As ATVs continue to rise in

popularity for both recreational and work use, the number of injuries will continue to climb. Therefore, it is imperative that farm safety advocates address these issues through increased hazard awareness education and access to training for ATV operators. These educational programs must stress the need for operators and passengers to wear the proper protective equipment for ATV use and ensure age-appropriate utilization. In addition, further research on the specific nature of ATV injuries is important to more adequately address the role issues such as farm type play in the relative risk to ATV operators.

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