

Section I: The Minority Farm Operator Childhood Agricultural Injury Survey

INTRODUCTION

Youth who live on, work on, or visit farms in the United States (U.S.) have been identified as a special population at high risk for non-fatal and fatal injuries [Adekoya and Pratt, 2001; Myers and Hendricks, 2001; Castillo et al., 1999; Rivara, 1997; NCCAIP, 1996]. Since 1996, the National Institute for Occupational Safety and Health (NIOSH) has conducted the Childhood Agricultural Injury Prevention Initiative to promote the reduction of injuries and fatalities to youth on farms in the U.S. [Castillo et al., 1998]. A major component of this initiative is the development of an ongoing surveillance program to track the frequency and incidence of non-fatal injuries and fatalities occurring to the various types of youth exposed to farm hazards.

An initial step in the development of the surveillance program was the completion of a farm operator survey in 1999. NIOSH collaborated with the U.S. Department of Agriculture (USDA), National Agricultural Statistics Service (NASS) to conduct the Childhood Agricultural Injury Survey (CAIS). The results of this survey were released in 2001, and contained both injury and youth demographic estimates for farms in the U.S. [Myers and Hendricks, 2001]. While the CAIS provided a statistically representative picture of the injury experience of youth on farms in the U.S., it did have some limitations. One major limitation of the CAIS was that it did not adequately cover minority operated farms (i.e., farms operated by racial minorities or operators of Hispanic ethnicity). This is due in large part to the small number of minority farms in operation in the U.S. Based on the 1997 Census of Agriculture, minorities accounted for just 3.3% of the nearly 1.91 million farms in the U.S. that year [USDA, 1999].

To address this limitation, NIOSH, through an Interagency Agreement, again collaborated with USDA, NASS to administer the Minority Farm Operator Childhood Agricultural Injury Survey (M-CAIS) in 2001 by using the 1997 Census of Agriculture sampling frame to identify minority farms. Like the CAIS before it, the M-CAIS provides injury and youth demographic estimates at the national and regional level, but the estimates are specific to minority operated farms in the U.S. In addition to injury information, the M-CAIS provides prevalence information on asthma among youth living on minority farms, which should provide unique information for health professionals working in the area of childhood asthma.

This document presents the national M-CAIS results for racial minority farm operations in an easily accessible statistical abstract format. A racial minority farm operation includes farms operated by Blacks, Native Americans, Asians, or operators of “other” races. “Other races” includes operators native to or of ancestry from Mexico, the Caribbean, and Central or South America [USDA, 1999]. This document includes injuries to all youth on racial minority operated

farms regardless of the race or ethnicity of the injured youth (i.e., a white youth who worked and was injured on a racial minority farm would be included in these statistics). Future documents, in a similar format, will provide national data for Hispanic farm operations, regional data for racial minority farm operations, and regional data for Hispanic farm operations. Due to the quantity of data, no attempt was made to interpret the results presented. A list of NIOSH documents and publications that do provide interpretation of these and other childhood farm injury data is provided in Appendix A. It is hoped that the data presented here will be used by public health and safety professionals, engineers, and other groups working in the area of childhood farm safety and health to help in their intervention programs and injury control research.

The estimates, prevalence rates, and incidence rates presented in this statistical abstract were calculated by NIOSH and are presented with the approval of USDA, NASS. Access to all M-CAIS data files, or additional estimates from the M-CAIS data, are subject to the approval of USDA, NASS.

METHODS

General Survey Design: The M-CAIS was conducted for NIOSH by USDA, NASS through an Interagency Agreement. The survey was defined as a census of the 49,270 minority farm operations identified in the NASS 1997 Census of Agriculture list. A farm was considered to be eligible for M-CAIS regardless of whether youth were on the farm in 2000. This was necessary to allow for meaningful estimates of both injuries and the number of youth on farms for the various youth populations covered in the survey. Because of confidentiality concerns, racial minority farm operators and Hispanic operators were handled independently. This resulted in a certain number of farms being used to calculate both the racial minority estimates and the Hispanic estimates. In other words, individual operators who reported being a racial minority and of Hispanic ethnicity are represented in both sets of estimates. However, farm operators who are white and of Hispanic ethnicity are excluded from the racial minority estimates. Because of this overlap, it is not possible to add racial and Hispanic estimates together.

The survey used a Computer Assisted Telephone Interview (CATI) survey instrument. The interviews were conducted by 10 NASS calling centers between February and March of 2001. The M-CAIS was conducted in these winter months to increase the response rate of the survey. Participation in the survey was strictly voluntary. The survey instrument (Appendix B) used for the M-CAIS was designed to not exceed one-half hour, with an average response time of seven minutes. Definitions used in the questionnaire and throughout this document are provided in Appendix C.

In addition to the main CATI data collection effort, 5 NASS state offices conducted personal interviews with a sample of 2,088 minority operators that were not contacted during the CATI survey period. The two main reasons that these farm operators were not contacted during this period were that the operator was not available even upon repeated contact attempts, or that

NASS did not have a working telephone number on file. The 5 states that conducted the personal interviews were Alabama, Arizona, California, New Mexico, and Texas. These states were selected because they had the largest number of minority farm operations. The personal interviews were conducted during April and May of 2001 with the same survey instrument used in the CATI process.

The data collected for M-CAIS were self-reported by either the female or male head of household. If an injury occurred to a household youth 16-years of age or older, and the youth was available to talk to the NASS enumerator, he or she was asked to answer the injury section of the survey. Information such as youth demographics, the occurrence of an injury, and the characteristics of an injury event were subject to the interpretation of the respondent.

For the survey, a farm was defined as any operation with \$1,000 or more of gross agricultural production within a calendar year, and included both crop and livestock operations. A youth was defined as any person under the age of 20 years. Household youth were defined as all youth who resided on the farm. Hired youth were defined as youth who were hired directly by the farm operator, excluding contract laborers, to work on the farm, but were not household members. Visitors were defined as all other youth who were on the farm, but were not household members or hired workers.

An injury was defined as any condition that resulted in 4 hours or more of restricted activity (e.g., the individual could not perform work or other normal duties, missed work, and/or missed school), or a condition that required professional medical treatment. While the total number of childhood agricultural injuries was requested for the calendar year 2000, descriptive information was collected only for the four most recent injury events. An agricultural work-related injury was defined as any injury meeting the above definition that occurred while performing work on the farm associated with the farm business, including chores. Non-work injuries were defined as injuries occurring on the farm that were not due to farm work. The survey excluded injuries to contractors working for the farm operation, or injuries that occurred to youth off the farm property. The categorical injury variables of “source of injury” and “event or exposure” were coded from narrative injury descriptions using the Bureau of Labor Statistics Occupational Injury and Illness Classification Manual [USDOL, 1992].

Asthma was assessed for household youth only. A household youth was defined as being an asthmatic if the asthma had been diagnosed by a health professional. An asthma attack at work was defined as any attack that occurred while the youth was doing farm work, and required the use of an inhaler or other medical treatment. A professionally treated asthma attack was defined as any attack that required an emergency room visit, hospitalization, or other professional medical attention, beyond the use of an inhaler. A positive response to either the asthma attack at work or the professionally treated asthma attack question indicated that at least one such attack occurred to the youth during 2000. The actual number of either type of attack was not collected. Therefore, these asthma statistics are measures of prevalence only. Finally, the two types of

asthma attacks are not mutually exclusive. It is possible that an asthma attack incident occurred while the youth was doing farm work and that the youth received professional medical treatment for the same attack.

To facilitate the correct matching of injury estimates to youth at risk, specific demographic terms were used for the various combinations of youth populations in the survey (Table 1.1). In this document, “All youth” refers to the sum of all youth categories covered in the survey (i.e., “Household youth,” “Hired youth,” “Relatives,” and “Non-relatives”). “Visiting youth” refers to the combination of “Relatives” and “Non-relatives” that were on the farm in the year 2000. “All working youth” refers to “Working household youth,” combined with “Hired youth” and “Working relatives.” Finally, “Non-household working youth” refers to the combination of “Hired youth” and “Working relatives.”

The racial and Hispanic origin classification for the farm operator and all household youth were set to the racial and Hispanic classification provided on the 1997 Census of Agriculture sampling frame. In addition, “Asians” and “Native Hawaiian or Other Pacific Islanders” were combined into a single Asian category for all analyses. “Other races” was defined in the 1997 Census of Agriculture as persons native to or of ancestry from Mexico, the Caribbean, and Central and South America [USDA, 1999].

Table 1.1 Demographic terms and the specific youth populations they represent for all statistical tables presented in Sections I through VI

		Terms					
	Youth Population	All youth	Household youth	Visiting youth	Relatives	All working youth	Non-household working youth
Household	Non-working household youth	X	X				
	Working household youth	X	X			X	
Non-household	Hired youth	X				X	X
	Non-working relatives	X		X	X		
	Working relatives	X		X	X	X	X
	Non-relatives	X		X			

Estimation Procedures: The estimation procedure for the M-CAIS was developed as a two step process. The first step involved post-stratifying the CATI and personal interview results to account for farm operators who refused to participate in the survey, or were inaccessible. For the racial minority data, the results were post-stratified by the four farm operator racial categories (Black, Native American, Asian, and “Other”) within the nine U.S. geographic regions defined by the U.S. Bureau of the Census (Table 1.2) [US Department of Commerce, 1975]. For the Hispanic data, post-stratification was for the nine geographic regions only. Variance estimates for the survey were derived by applying the unbiased estimators for a stratified simple random sample to these post-stratified data [Cochran, 1977]. The estimators for racial minority

Table 1.2 U.S. Bureau of the Census Geographic Regions of the U.S.

4 Regions	9 Regions
Northeast	New England: Connecticut, Maine, Massachusetts, New Hampshire Rhode Island, Vermont Mid-Atlantic: New Jersey, New York, Pennsylvania
Mid-West	East North Central: Illinois, Indiana, Michigan, Ohio, Wisconsin West North Central: Iowa, Kansas, Minnesota, Missouri, Nebraska North Dakota, South Dakota
South	South Atlantic: Delaware, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia East South Central: Alabama, Kentucky, Mississippi, Tennessee West South Central: Arkansas, Louisiana, Oklahoma, Texas
West	Mountain: Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming Pacific: Alaska, California, Hawaii, Oregon, Washington

population totals and their corresponding variances are presented in Appendix D. The estimators for Hispanic totals and variances are provided in Volume II.

The second step in the estimation process was benchmarking the post-stratified survey results to the published counts for minority-operated farms released in the 1997 Census of Agriculture. The 1997 Census of Agriculture reported 47,658 racial minority farms. This number includes imputed values for racial minority farm operations (i.e., some farm operations without racial data for the operator were classified as racial minority operations based on characteristics of the farm operation or other factors). Since these imputed values caused the published racial minority farm count (47,658) to be higher than the sampling frame racial minority farm count (35,084), the benchmarking process was necessary.

Benchmarking was applied by race within the nine geographic regions. Because benchmarking changed each post-stratified population total by a constant, it did not change the relative variance of any post-stratified population estimate. Therefore, the relative variances from the non-benchmarked post-stratified estimates were used to derive the standard errors for all benchmarked population estimates. The equations used to derive benchmarked racial minority population estimates and variances are provided in Appendix D. The benchmark equations for Hispanic population estimates and variances are provided in Volume II.

Incidence and Prevalence Rate Estimates: The injury incidence rates were calculated as the estimated number of injuries at the national level, divided by the estimated appropriate youth estimate at the national level. For work-related injury rates, only working household and working non-household youth were included in the denominator. For non-work-related injury rates, all

youth were included in the denominator because it was assumed that all youth could sustain a non-work injury. The overall household youth asthma prevalence rate and the prevalence rate for professionally treated asthma attacks used all household youth as the denominator. The prevalence rate for asthma attacks while doing farm work used only working household youth in the denominator. All rates are expressed in terms of 1,000 youth potentially exposed.

The variance calculations for the population-based incidence or prevalence rates were estimated using the linear combination of variances for the injury or asthma estimate and the youth estimate as described by Cochran [1977] (Appendix D).

Categorical Frequency Estimates: The frequency estimates for categorical variables from the M-CAIS were based on three types of information: demographic, injury, and asthma. Demographic data included an estimate of household youth, the number of hired youth, and the number of visiting youth for the calendar year 2000. For household youth, estimates by sex, age, and various types of exposure information (e.g., working on the farm, riding a horse) were also calculated. Injury data included information such as whether an injury was work-related or not, the nature of the injury, the source of the injury, the event or exposure leading to the injury, and the body part injured. This information was only collected for the four most recent injuries that occurred on a farm. Asthma data were collected for household youth only, and included prevalence estimates for youth with asthma, asthmatic youth with at least one asthma attack while doing farm work in 2000, and asthmatic youth who required professional medical treatment for an asthma attack in 2000.

Frequency tables for the various racial categories are presented at differing levels of detail because of differing levels of sampling error and minimum case requirements between the various estimates. In all instances, an estimate was required to have 3 or more farms with a non-zero value to be reportable. This was the only restriction placed on injury or asthma estimates from the M-CAIS. Youth estimates were further restricted if the relative standard error of an estimate exceeded 34%. For some tables, youth estimates are reported with relative standard errors above 34% because they were deemed critical to the interpretation of the frequency table. However, no youth estimate is reported with a relative standard error greater than 50%. If an injury or youth estimate was censored because of either of these two criteria, a series of other cells within the table were also censored to prevent obtaining restricted data through subtraction. Where possible, these secondary censored values were targeted at broader categories within a table.

Survey Limitations: There are several limitations to the results presented in this report. The first limitation is the NASS census sampling frame used for the survey. The 1997 Census of Agriculture list does not account for new minority farming operations that were established after 1997. In addition, some minority farm operators may have been left out of the sample because the operator self-selected themselves into non-minority categories for race or ethnicity in the 1997 Census of Agriculture. The extent of self-misclassification in the 1997 Census of Agriculture is unknown. A second limitation is that the recall period for an injury or asthma attack in this survey

was up to 15 months. While the definition of an injury or asthma attack was for more severe cases, which may be easier to recall, there is still the possibility that a reportable injury or asthma attack was not remembered by a respondent. A third limitation is that most surveys were conducted with the female head of household, which may have resulted in an under-reporting of hired youth injuries, especially for larger farming operations with many employees. Fourth, there was no way to verify the accuracy or completeness of the responses given in this survey, which could impart some response bias into the overall results. Fifth, this survey did not include injuries which occurred to youth contract farm workers. Injuries to contract farm workers are being assessed through a separate NIOSH study, and will be provided in a separate report.

A final limitation is the possibility of a bias because of non-response to the telephone survey. Due to the survey design, it was not possible to make a second contact to farm operators who refused to participate in the survey. This did not allow for a follow-back questionnaire to assess these refusals. For non-response due to inaccessibility, the inclusion of 2,088 personal interviews did improve the coverage, but did not eliminate all bias. The post-stratification of the M-CAIS results by race and geographic region greatly reduced the impact of the non-response bias.

LAYOUT AND USE OF THE DATA TABLES

The data tables contained within this document are designed to provide the user as much information as possible. However, as with all such documents, the tables are subject to the usual limitations of 2-way or 3-way classification tables, as well as the limitations imposed by printing space. Because of this, no percentages are provided in any of the frequency tables. Rather, the reader is provided the grand total and marginal totals in each table, except for values that are suppressed for reasons of confidentiality.

Frequency Table Layout: Frequency tables generally follow the same layout (Table 1.3). The grand total, A, is displayed as the bottom left data cell. Marginal totals, B, are displayed in the far left data column, and in the bottom row. The grand total and marginal totals are typically shaded in gray. The 2-way variable estimates, C, are presented in the non-highlighted body of the table. The standard errors a, b, and c are provided immediately next to each corresponding estimate.

In addition to the typical row or column marginal values, certain tables may also contain major group, subgroup, and detailed values. Major group and subgroup values occur on most tables involving “Age” and “Type of farming operation.” Detailed values are associated with most tables involving “Relationship to the farm,” “Source of injury,” and “Type of injury event.” A major group represents a broad grouping of values for a particular variable, while the subgroup represents either individual values for the variable, or smaller groupings of values for the variable. Detailed values represent the most detailed estimate possible for the specific variable. Major groups are shown in bolded text, while subgroups are shown as indented, non-bolded text beneath major group entries. Detailed entries are provided in indented, italicized text beneath subgroup entries.

Table 1.3 General layout of data tables in Sections II through VI. “A” represents the grand table total, “B” the marginal totals, and “C” the 2-way variable estimates within the table. The values “a,” “b,” and “c” are the corresponding standard error estimates of “A,” “B,” and “C.” Bold table entries denote major group estimates for variables, non-bolded entries denote subgroup estimates for variables, and italicized entries denote a detailed estimate for a variable.

Variable 2	Total †		Variable 1 major group		Variable 1 major group		Unknown Estimate
	Estimate	se	Estimate	se	Estimate	se	
Variable 2 major group	B	b	C	c	C	c	C
Variable 2 subgroup	B	b	C	c	C	c	C
<i>Variable 2 detailed</i>	<i>B</i>	<i>b</i>	<i>C</i>	<i>c</i>	<i>C</i>	<i>c</i>	<i>C</i>
Variable 2 major group	B	b	C	c	C	c	C
Variable 2 subgroup	B	b	C	c	C	c	C
<i>Variable 2 detailed</i>	<i>B</i>	<i>b</i>	<i>C</i>	<i>c</i>	<i>C</i>	<i>c</i>	<i>C</i>
Unknown	B	b	C	c	C	c	C
Total †	A	a	B	b	B	b	B

† Estimates may not add to the total because of rounding.

The following is an example of this layout for the variable “Age,” using Table 2.4 on page 19. The major groups for age in the document are “<10 years,” “10-15 years,” “16-19 years,” and “Unknown.” In addition to these 4 major age groups, there are 5 age subgroups. Under the major group “10-15 years,” there are three subgroups: “10-11 years,” “12-13 years,” and “14-15 years.” For the major group “16-19 years,” there are two subgroups: “16-17 years” and “18-19 years.” The major groups “<10 years” and “Unknown” have no subgroups.

Collapsed categories: Because of reporting restrictions, not all values may be reported in a table (see discussion of reporting requirements under “Categorical Frequency Estimates” in the Methods section, page 6). In this document, a non-reportable cell is denoted in a table as “***.” In some circumstances, values for a variable may be collapsed into a broader category. For example, in Table 3.43, page 106, the major age groups of “10-15” and “16-19” are collapsed into a single broad age group, “10-19.” A second example can be seen in Table 2.29 on page 32. Here, the subgroup farm types of “Tobacco,” “Cotton,” “Nursery and floriculture,” and “Other crop” farms are collapsed into a single broad category, “All other crop” farms. In the same table, “Dairy,” “Aquaculture,” and “Other livestock” farms are collapsed into the single group, “All other livestock” farms. Collapsed categories for most variables are footnoted in individual tables. Standard error estimates for these collapsed categories are not provided in the document.

Calculating Percentages within Frequency Tables: Percentage distributions from these tables may be calculated at the table level, row marginal level, column marginal level, and for subgroups within major groups. Using the notation from Table 1.3, table level percentages (T%) can be obtained by dividing any table entry B or C, by the grand table total A. Using Table 2.4 as an

example, the table level percentage for household youth less than 10 years of age is:

$$T\%_{\text{household youth <10 years}} = (9,339/28,577)*100 = 32.7\%,$$

meaning 32.7 percent of all household youth are less than 10 years of age. Similarly, the table level percentage for household males less than 10 years of age is:

$$T\%_{\text{household males <10 years}} = (4,799/28,577)*100 = 16.8\%,$$

meaning 16.8 percent of all household youth are males below the age of 10 years.

The row marginal percentages (RM%) involve dividing values of C by the corresponding row marginal total, B. Using Table 2.4 again, the row marginal percentage for household males less than 10 years of age is:

$$RM\%_{\text{household males <10 years}} = (4,799/9,339)*100 = 51.4\%,$$

meaning 51.4 percent of all household youth less than 10 years of age are male.

Using the same approach, the column marginal percentage (CM%) for males less than 10 years of age from Table 2.4 is:

$$CM\%_{\text{household males <10 years}} = (4,799/14,643)*100 = 32.8\%,$$

meaning 32.8 percent of all household males are less than 10 years of age.

When looking at tables with major groups and subgroups, the T% values of the row or column major group marginal cells will add to 100%, except for rounding. The T% values for the row or column subgroup marginal cells will add to the corresponding major group percentage they are beneath, except where subgroup values are suppressed. Using a similar logic, percentages may also be derived for subgroup values within major groups. For example, from Table 2.4, the percentage of household youth 10-11 years of age out of all household youth 10-15 years of age is $(3,219/10,577)*100$, or 30.4 percent.

Rate Table Layout: The layout for rate tables in this document is similar to that for frequency tables. Rates are provided for the grand total, row marginal values, column marginal values, and where appropriate, the 2-way table values (see “Incidence and Prevalence Rate Estimates” on page 5 of the Methods section for a discussion of how rates were derived). As with frequency tables, standard errors are not provided for rates involving collapsed cells.

Comparison to Other Public Health Data: Readers are asked to use care in comparing the results provided in this document to those reported from other public health data sets. Readers should review carefully the definitions, methods, and limitations presented in this document before making comparisons to other published reports, or studies.

The data provided in this document are derived using statistical weights, and are reported with standard errors. Confidence intervals can be calculated for any level of confidence by multiplying the standard error by the appropriate value of “t” from the Students-t distribution (e.g., 1.96 for a 95% confidence interval). It is important that comparisons to other published reports or data take these standard errors or confidence intervals into account.

NATIONAL HIGHLIGHTS FOR RACIAL MINORITY FARMS

The following is an overview of the national results of the M-CAIS for racial minority farm operations. Detailed results with standard errors (se) are presented in Sections II through VI. Section II presents results for all racial minority operated farms combined. Sections III through VI provide results by specific racial categories (i.e., Black, Native American, Asian, and “Other”).

Survey Response: A total of 49,270 minority farm operations were identified in the 1997 Census of Agriculture sampling list. The number of racial minority farms identified by the list was 35,084. Of all eligible farms, 36,424 were contacted either by telephone or by a NASS field enumerator. The remaining 12,846 eligible farms were inaccessible. Of the 36,424 farms who were contacted, 9,254 refused to participate, for a responding farm count of 27,170. This resulted in an overall adjusted M-CAIS response rate of 74.6%. The number of racial minority farms among these respondents was 19,083. These 19,083 were weighted to the 35,084 racial minority farms on the NASS sampling list and then benchmarked to the 47,658 racial minority farms published in the 1997 Census of Agriculture (see Estimation Procedures on page 4 for more information).

Youth Demographics: There were an estimated 416,088 ($\pm 5,473$) youth under the age of 20 years who lived on, worked on, or visited a racial minority operated farm in 2000. Youth living in the farm household accounted for an estimated 28,577 (± 254) youth. Youth hired directly by the farm accounted for 7,435 (± 533) youth and an estimated 380,076 ($\pm 5,404$) youth were visitors to the farm. Relatives accounted for 191,848 ($\pm 1,653$) of these visitors. Livestock operations had the greatest number of youth on the farm in 2000 (253,330 $\pm 3,951$) with crop operations having an estimated 152,222 ($\pm 3,979$) youth on their operations. There were 147,573 ($\pm 2,597$) youth under the age of 20 years present on farms with Black operators. Farms with a Native American operator had 127,947 ($\pm 2,765$) youth, while Asian-operated farms had 46,465 ($\pm 2,919$) youth. The remaining 94,103 ($\pm 2,792$) youth were on farms operated by some “other” racial minority.

There were an estimated 34,525 (± 682) youth under the age of 20 years who did work on racial minority operated farms in 2000. These included household youth who performed work on the farm, youth hired directly by the farm, and any non-household relatives who worked on the farm. Livestock operations accounted for the most working youth (20,863 \pm 393). Crop operations accounted for an additional 13,208 (± 573) working youth.

Of the 28,577 youth less than 20 years living on racial minority operated farms, 14,643 (± 160) were males and 13,042 (± 151) were females. There were 9,339 (± 136) household youth under the age of 10 years, 10,577 (± 134) between the ages of 10 and 15 years, and 7,648 (± 105) between the ages of 16 and 19 years. There were 7,688 (± 116) household youth on farms with a Black operator. Farms with a Native American operator had 7,381 (± 123) household youth, Asian-operated farms had 5,700 (± 127) household youth, and an estimated 7,808 (± 142) youth were living on farms operated by some "other" racial minority. A total of 11,753 (± 159) household youth on all racial minority farms did farm work during 2000. Also during that year, 7,459 (± 130) household youth were reported to have ridden a horse for either work or recreation, 6,514 (± 117) operated an ATV for work or recreation, and 6,452 (± 106) youth were said to have operated a tractor on the farm.

Injuries to All Youth: There were an estimated 531 (± 30) youth injuries on racial minority operated farms in 2000. Of these injuries, 200 (± 18) were work-related and 326 (± 23) were non-work-related. The work-related injury rate for all youth was 5.8 per 1,000 working youth (± 0.5), while the non-work-related injury rate was 0.8 injuries per 1,000 youth (± 0.1). Household youth accounted for the highest number of injuries (348 \pm 25), followed by relatives (124 \pm 13), visitors that were not relatives (37 \pm 8), and hired workers (20 \pm 6). Most injuries occurred to males (382 \pm 25). Youth less than 10 years of age had the highest number of injuries (166 \pm 17), followed by youth 14 and 15 years of age (112 \pm 12). For work-related injuries, the highest number occurred to youth 16 and 17 years of age (54 \pm 9), followed by youth 14 and 15 years of age (47 \pm 8).

Native American youth experienced the highest number of injuries (206 \pm 18). Black youth experienced 78 injuries (± 11), white youth had 92 (± 12) injuries, Asian youth experienced 40 (± 8) injuries, and youth of some "other" minority race accounted for 108 (± 15) of the injuries on racial minority farms. White youth injured on these farms were identified as relatives, hired workers, or visitors.

The most common source of injury for all youth on these farms was structures/surfaces. This source, which includes the ground, floors, and fences, accounted for 164 (± 15) of the injuries. The most common type of injury event was contact with an object (163 \pm 15), while 147 (± 14) injuries were the result of a fall. The parts of the body most commonly injured were the arm (91 \pm 11); hand, wrist, and finger (79 \pm 11); or the leg (77 \pm 11). Injuries most frequently resulted in cuts (130 \pm 14) or fractures (121 \pm 13).

Livestock operations accounted for 362 (± 24) of all injuries to youth on these farms, while crop farms reported 163 (± 17) injuries to youth. Beef operations had the highest number of youth injuries (244 ± 20), followed by grain and oil seed farms (61 ± 12), and equine operations (46 ± 9). Although livestock operations experienced the majority of injuries, the difference in injury rates for livestock and crop operations was small: livestock operations had an injury rate of 1.4 per 1,000 youth (± 0.1) compared to 1.1 per 1,000 youth (± 0.1) on crop operations.

Injuries to Household Youth: There were 348 (± 25) household youth injuries on racial minority farms in 2000. The injury rate for household youth on racial minority operated farms was 12.2/1,000 household youth (± 0.9). Males accounted for 245 (± 20) of these injuries while 103 (± 13) were to females. The rate of injury for males was 16.7 per 1,000 household youth (± 1.4), which was more than twice the injury rate for females (7.9 per 1,000 household youth ± 1.0). Household youth less than 10 years of age were estimated to have the highest number of injuries (112 ± 15), followed by household youth age 14 and 15 years (74 ± 10), and household youth 16 and 17 years of age (52 ± 9).

There were 138 (± 15) work-related injuries to household youth on racial minority farms, for a corresponding work-related injury rate of 11.8 per 1,000 working household youth (± 1.3). Males accounted for 114 (± 13) of these injuries. The highest number of these work-related injuries were found for household youth 14 and 15 years of age (40 ± 7) and youth 16 and 17 years of age (39 ± 8). Youth 14 and 15 years of age had the highest work-related injury rate among household youth (19.3/1,000 working household youth ± 2.6), followed by youth 10 and 11 years of age (14.0/1,000 working household youth ± 2.4).

Youth living on a farm operated by a Native American had the highest injury rate for household youth (24.0 injuries/1,000 Native American household youth ± 2.2), followed by household youth living on “other” race farms (12.3 injuries/1,000 “other” race household youth ± 1.9). Household youth on Black farms had an injury rate of 6.4 per 1,000 Black household youth (± 1.2). Household youth on Asian farms had the lowest rate of 4.5 per 1,000 Asian household youth (± 1.1).

As was seen for all youth, household youth on livestock operations reported the most injuries (247 ± 20), followed by crop operations (101 ± 14). By specific type of farm, beef operations had the highest number of youth injuries (162 ± 17) followed by grain and oil seed operations (42 ± 11). Unlike the injury rates seen for all youth where the injury rates for livestock and crop operations were similar, livestock operations had a household injury rate twice that of crop operations (16.8 per 1,000 household youth ± 1.4 and 8.2 per 1,000 household youth ± 1.1 , respectively). Sheep and goat operations had the highest injury rate (46.7 per 1,000 household youth ± 13.7). This rate was nearly four times the overall rate for household youth. Other types of farms that had an injury rate higher than 20 injuries per 1,000 household youth were: equine operations (33.4 ± 8.5), poultry and egg operations (20.9 ± 9.0), and grain and oil seed operations (20.6 ± 5.2).

The most common source of injury for youth living on racial minority operated farms was structures and surfaces (117 ±13). Falls were the most common injury event (109 ±13), followed by contact with objects (108 ±12). The parts of the body most commonly injured were the arm (58 ±9); the leg (54 ±9); or the hand, wrist, and finger (48 ±8). Injuries most frequently resulted in cuts (95 ±12) or fractures (78 ±10).

Asthma Among Household Youth: An estimated 2,506 (±63) household youth living on racial minority farm operations were reported as having been diagnosed with asthma. Of these asthmatic youth, 813 (±36) reportedly experienced at least one asthma attack while doing farm work during 2000, while 530 (±26) experienced at least one asthma attack serious enough to require professional medical attention. The overall asthma prevalence rate for these household youth was 87.7 asthmatics per 1,000 household youth (±2.3). Males had a higher prevalence rate at 108.1 asthmatics per 1,000 household youth (±3.5), while females had a prevalence rate of 70.5 asthmatics per 1,000 household youth (±2.8).

The number of household youth reported to have asthma was somewhat higher on livestock operations (1,324 asthmatics ±45) than on crop farms (1,111 asthmatics ±43). The prevalence rates, however, were statistically identical for livestock and crop operations (90.0 asthmatics/1,000 household youth ± 3.3 and 90.6 asthmatics/1,000 household youth ±3.8, respectively). The number of household youth who reportedly experienced one or more asthma attacks while doing farm work during 2000 was also higher on livestock operations (422 working asthmatics ±25) than on crop farms (367 working asthmatics ±25). However, crop farms had the highest rate of household youth with one or more asthma attacks while doing farm work (88.7 working asthmatics/1,000 working household youth ±6.5) when compared to livestock operations (57.3 working asthmatics/1,000 household youth ±3.5).

Household youth living on Black farm operations had the highest number and rate of reported asthma in this survey (745 asthmatics ±30 and 96.9 ±4.2 asthmatics/1,000 Black household youth, respectively). Native Americans had the second highest number of household youth with asthma (660 asthmatics ±33), followed by household youth on “other” race farms (632 asthmatics ±34), and household youth on Asian farms (469 asthmatics ±28). Household youth on Native American farms had the second highest rate of asthma (89 asthmatics ±5), followed by Asian household youth (82 ±5), and "Other" race household youth (81 ±5).

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