



Youth on racial minority operated U.S. farms, 2008: Demographics and injuries[☆]

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ARTICLE INFO

Article history:

Received 29 April 2014

Received in revised form 18 September 2014

Accepted 24 September 2014

Available online 7 October 2014

Keywords:

Minority

Agriculture

Injury

Youth

Surveillance

ABSTRACT

Introduction: To obtain injury surveillance data for youth on racial minority operated farms, the National Institute for Occupational Safety and Health developed the Minority Farm Operator Childhood Agricultural Injury Survey (M-CAIS) in collaboration with the U.S. Department of Agriculture. **Methods:** Using a regionally stratified telephone survey of U.S. minority operated farm households, M-CAIS data were collected for youth less than 20 years of age. **Results:** There were an estimated 37,443 youth living on racial minority operated U.S. farms in 2008, almost half (46%) of these youth worked on the farm. Racial minority farm operators hired 6,443 youth, and reported an estimated 775,991 youth relative and other visitors on the farm. These youth suffered an estimated 516 injuries (5.9 injuries/1000 farms). **Conclusions:** Household youth had an injury rate of 7.8 injuries/1000 household youth and a work-related injury rate of 6.9 injuries/1000 working household youth. **Practical applications:** The research enables agricultural safety and health researchers, practitioners, and educators to identify priorities and design trainings and interventions to minimize the risk of farm hazards to youth on racial minority farm operations in the United States.

National Safety Council and Elsevier Ltd.

1. Introduction

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 United States (Castillo, Hard, Myers, Pizatella, & Stout, 1998). This initiative included the development of an ongoing surveillance program to track nonfatal injuries to youth less than 20 years of age on farms. In collaboration with the U.S. Department of Agriculture, National Agricultural Statistics Service (USDA, NASS), NIOSH conducted the first Childhood Agricultural Injury Survey (CAIS) in 1999. The results of the CAIS were released in 2001, and contained injury and youth demographic estimates for farms in the United States (Myers & Hendricks, 2001).

Given the small number of minority operated farms in the United States (i.e., farms operated by racial minorities or operators of Hispanic ethnicity), the sample of farms selected for inclusion in CAIS data was inadequate to analyze injury events and trends for youth on minority

operated farms.¹ Based on the 1997 Census of Agriculture, racial minorities accounted for just 2.5% (47,658 farms) of the nearly 1.91 million farms in the United States (USDA, 1999). To address this limitation, NIOSH again collaborated with NASS to administer the Minority Farm Operator Childhood Agricultural Injury Survey (M-CAIS) to assess youth injuries on these operations for the calendar year 2000. M-CAIS was administered exclusively to minority-operated farms. Since the initial survey, the M-CAIS has also been conducted for the calendar years 2003 and 2008.

This paper provides overall demographics, injury estimates, and rates for the sub-population of youth on racial minority operated farms in the United States during 2008. A comparison of the results from 2008 to those found in the 2000 M-CAIS is also provided.

2. Methods

2.1. M-CAIS

In 2009, NIOSH, in collaboration with the USDA, NASS, conducted the M-CAIS which collected data for the 2008 calendar year. The M-CAIS is a telephone survey of all racial minority farm operators on the

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¹ Minority farm operators include racial minorities and Hispanic farm operators. The sum of racial minority farms and Hispanic farms is greater than the total number of minority farm operations because of farm operators who are both a racial minority and of Hispanic origin.

2007 Census of Agriculture list frame. Racial minority categories included Black, American Indian/Alaskan Native, Asian, Native Hawaiian/Pacific Islander, and multiple races. All surveys were conducted by trained NASS enumerators at USDA calling centers. A farm, defined as any operation that had at least \$1000 in gross agricultural receipts in a calendar year, was considered eligible for the 2008 M-CAIS regardless of whether youth were on the farm in 2008. This was necessary to allow for meaningful estimates of both injuries and the number of youth on farms.

For the calendar year 2008, demographic data were collected for members of the farm household and for any youth directly hired to work on the farm. Household youth were defined as all youth who resided on the farm. Exposure data were also collected on whether or not household youth had worked, ridden a horse for work or recreation, or operated an all-terrain vehicle (ATV) or tractor for work or recreation. These exposure questions asked prevalence only and were not mutually exclusive. Data were also collected on the total number of youth visiting the farm. The only demographic data collected for visitors were if they were related to the farm operator; and if so, did they perform any work.

For the M-CAIS, an injury was defined as any 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. Data were collected for on-farm injuries that occurred during the 2008 calendar year to youth less than 20 years of age (includes youth aged 0 to 19 years). Information was collected on both work and non-work injuries to youth who were either living on the farm, visiting the farm, or hired directly by the farm operator. Injuries to contract laborers were excluded from this study. Data for contract and migrant laborers are captured in the National Agricultural Workers Survey (US DOL, 2011). 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.

General injury information, such as sex, age, nature of the injury, body part injured, work-relatedness of the injury, and an injury narrative, was collected for the four most recent youth injuries on each farm. The source that directly inflicted the injury and the type of injury event were coded by NIOSH staff from the injury narratives according to the Occupational Injury and Illness Classification System (BLS, 1992).

2.2. Statistical survey weights

Sampling weights were calculated based on four levels of stratification: sub-region of the United States, racial category, value of farm sales, and a census adjustment weight. Nine sub-regions were used to stratify the M-CAIS data (Table 1). Racial categories were combined into four categories: Black; American Indian/Alaska Native; Asian/Native Hawaiian/Pacific Islander; and Multiple Races. For value of sales, three broad categories were used: sales of less than \$10,000; sales of \$10,000 to \$99,999; and sales of \$100,000 or more. The lowest level of stratification, the census adjustment weight, contained six levels and accounted for undercounted farms in the 2007 Census of Agriculture. The census adjustment weight assigned to each individual farm

was based on a complex statistical algorithm (USDA, 2009). All final weights were expanded to match the 2007 Census of Agriculture's published race-specific farm counts in the nine geographic sub-regions by value of sales.

All estimates and variances for both the injury and the demographic data were obtained by the SAS SURVEYMEANS procedure (SAS, 2011). Variance estimates incorporated a finite correction term because of the high sampling fractions within many of the strata. Estimates and 95% confidence intervals (CI) are presented where the relative standard error does not exceed 33% of the estimate. Most of the demographic estimates are presented in the four geographic regions. Due to regional differences in injury numbers and confidentiality requirements, injury estimates were collapsed into three regions: Northeast/Midwest; South; and West. Injury rates were calculated as the estimated number of injuries, divided by the estimated number of youth. All rates are expressed in terms of 1000 youth. Variances for injury rates were calculated using a linear combination of the numerator and denominator variances. Confidence intervals were utilized as a basic measure of statistical significance.

3. Results

3.1. Response rate

The 2007 Census of Agriculture list frame contained 51,736 racial minority farm operators of which 32,972 responded to the 2008 M-CAIS (crude response rate = 64%). The response rate by racial category varied from a high of 77% for Black farm operators to a low of 47% for American Indian/Alaska Native operators. By region, the highest response rate was seen in the South (73%), followed by the Midwest (65%) and Northeast (65%). The West region had the lowest response rate (49%) due in large part to a very low response rate (32%) for American Indian/Alaskan Natives in this region. Response rates for American Indian/Alaskan Natives in other regions were above 62%. Four percent (3,633) of contacted farms reported that they were out of business and were not included in these analyses.

3.2. Demographics

In 2008, there were an estimated 86,834 racial minority operated farms in operation in the United States. Over half of these farms (48,785) reported having youth less than 20 years of age on their farm at least once during 2008, with 22% (19,000) reporting youth living in the household. An estimated 2,688 of these farms directly hired youth to work on the farm. There was an estimated 819,877 (95%_{CI} 786,109 to 853,645) total youth on these farms. An estimated 37,443 (95%_{CI} 36,465 to 38,422) youth were living in farm households, 6,443 (95%_{CI} 6,051 to 6,834) youth were workers hired directly by the farm operator, and 775,991 (95%_{CI} 742,316 to 809,666) youth were farm visitors. Of those youth visiting the farm, 416,044 (95%_{CI} 402,833 to 429,256) were relatives and 359,947 (95%_{CI} 329,953 to 389,940) were other visitors.

Table 1
Bureau of the Census geographic regions of the U.S.

Region	Sub-region	States
Northeast	New England	Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont
	Mid-Atlantic	New Jersey, New York, Pennsylvania
Midwest	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

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