

# Occupational Injuries among Minors Doing Farm Work in Washington State: 1986 to 1989

## ABSTRACT

**Background.** There is growing evidence that many children are injured while engaged in agricultural work. However, little specific information on farmwork-related injuries among minors is available, probably because employment or workers' compensation data for children are hard to obtain.

**Methods.** Workers' compensation data were used to evaluate occupational injuries among children in Washington State from 1986 through 1989. The frequency and severity of injuries among minors doing farm work were compared with the distributions of injuries among minors working in food service and all other occupations by year of injury, age of injury, and month and hour of injury.

**Results.** A total of 16,481 claims filed by children under age 18 were evaluated. Although farm workers accounted for only 7% of all claims, they made up 36% of claims filed by children under age 14, and 17% of claims filed by children aged 14 or 15. Injuries classified as serious accounted for 26% of farm worker claims compared with only 16% of all claims filed by children.

**Conclusions.** Although injury rates could not be developed owing to the lack of denominator data, this study demonstrates that farm work is dangerous for young children. (*Am J Public Health* 1992;82:557-560)

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## Introduction

Agriculture is one of the most hazardous industries in the United States, sharing with mining and construction the highest rates of occupational mortality.<sup>1</sup> Yet young children frequently work on farms and are subject to this risk. It has been estimated that 14% to 24% of all fatal injuries on farms (occupational and nonoccupational) occur among children 15 years of age or younger,<sup>1</sup> and that persons 19 years of age or younger are involved in 25 000 nonfatal traumatic events and 300 injury deaths on farms annually in the United States.<sup>2</sup>

Although numerous reports have looked at farm injuries among children in various states,<sup>1,3-11</sup> few have focused specifically on occupational (i.e., work-related) farm injuries among children. Two hospital-based reports on farm injuries among minors tried to focus on work-related injuries by excluding drownings, shootings, and poisonings. These reports demonstrated high levels of injury severity (largely due to involvement with machinery).<sup>4,11</sup> A study of fatal injuries involving tractors reported that 29% occurred among children aged 19 or younger.<sup>7</sup>

## Methods

The Washington State workers' compensation program (administered by the state's Department of Labor and Industries) covers all employers with one or more full- or part-time employees. Major exemptions include employees covered by some other compensation program (e.g., federal, police and fire fighters') or, for agricultural employment, family members of the farm owner who are minors

(under 18 years of age). Workers' compensation coverage may be through self-insurance or the State Fund. Two thirds of nonfederally employed workers in Washington State are covered by the State Fund.<sup>12</sup>

All claims for workers' compensation filed by minors through the State Fund were reviewed for the 4 years, 1986 through 1989. Claims filed for either injury or occupational disease were included because it is often difficult to distinguish between the two. However, disease claims represent less than 4% of all claims.<sup>13</sup>

The following data elements were used for our analysis:

1. US Bureau of Census Occupation Codes,<sup>14</sup> to define farm workers (code 479) and food service workers (codes 435 through 444). All claims not in one of these two categories were coded as "all others." Farmers (code 473), farm managers (code 476), and farm supervisors (code 477) were not included among farm workers, as they do not represent the farm employment of interest.
2. Age at time of injury, categorized into three groups: 13 years of age

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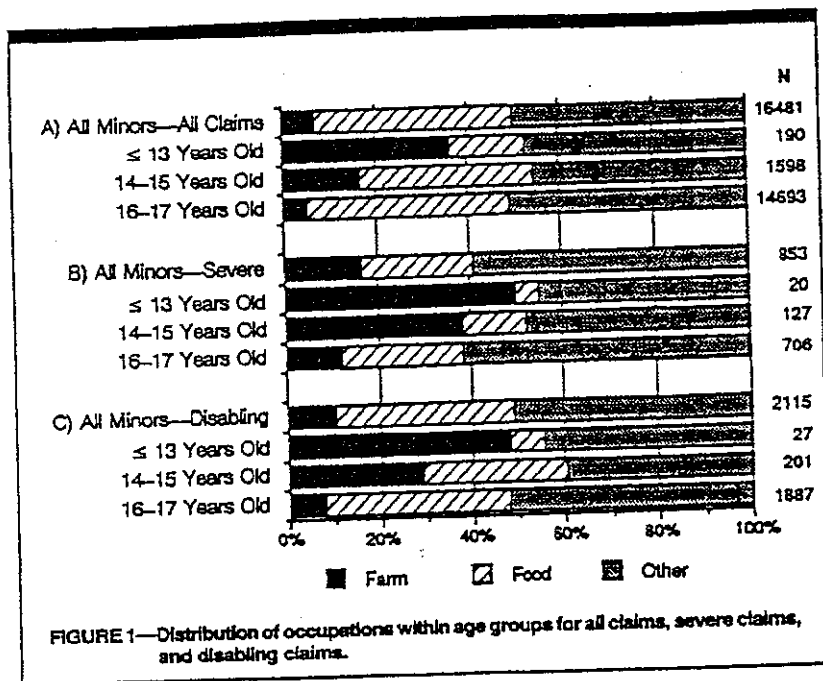


FIGURE 1—Distribution of occupations within age groups for all claims, severe claims, and disabling claims.

- or younger, 14 or 15 years of age, and 16 or 17 years of age.
- 3. Year of injury.
- 4. Month of injury, coded to season: winter (December, January, and February), spring (March, April, and May), summer (June, July, and August), and fall (September, October, and November).
- 5. Hour of injury, coded to AM (after midnight through noon) or PM (after noon and through midnight).
- 6. Serious injuries, defined using two independent, surrogate measures: nature of injury and time loss payment (made by the State Fund after the loss of 4 or more days of work). Nature of injury was recorded using the American National Standards Institute Z-16 codes.<sup>15</sup> Only injuries with code 100 (amputations), code 110 (asphyxiation or drowning), code 140 (concussion), code 210 (fracture), or code 400 (multiple injuries) were considered to be "severe." All injuries with time loss payments were considered to be "disabling."

Specifically, the workers' compensation records were used to examine the frequency and severity of claims among minors employed as farm workers. Although rates were not estimated because total employment data are not maintained for minors, the distribution of claims among mi-

nors in farm worker, food service, and all other occupations was evaluated, as the distribution of claims among injuries classified severe, disabling, or both. The relationships between injuries, season, and time of day of injury were also evaluated because of the nature of farm employment and its potential interaction with school performance.

**Results**

**All Claims**

A total of 916 475 claims were filed with the Department of Labor and Industries during this 4-year period, with 16 481 (1.8%) filed by minors. Of the claims filed by minors, 190 (1.2%) were filed by children aged 13 or younger, 1598 (9.7%) by children aged 14 or 15, and 14 693 (89.2%) by children aged 16 or 17.

Figure 1 shows the distribution of occupations for all claims by age group. Although farm workers represent less than 7% of all claims filed by minors, they account for 36% of claims filed by children aged 13 or younger and for 17% of claims filed by children aged 14 or 15. By comparison, food workers represent 43% of all claims filed by minors, of which only 16% were filed by children in the youngest age group and 38% by children aged 14 or 15.

**Serious Injuries**

A total of 2617 (15.9%) claims filed by minors were for serious injuries (severe,

disabling, or both). Among farm worker claims, 26% were for serious injuries. The relative frequencies of claims for severe and disabling injuries, severe only injuries, and disabling only injuries were all higher among farm workers than among food service workers or all other workers (Figure 2). The differences were greatest for the youngest age groups. Among farm workers, serious injuries accounted for 25% of all claims filed by children aged 13 years or younger and for 30% of all claims filed by children aged 14 or 15. By comparison, the percentages for food service workers were 12% and 6.5%, respectively.

Farm work contributes substantially to the total number of severe or disabling injuries among the two youngest age groups. Among workers aged 13 or younger, farm work accounted for 50% of all severe injury claims and for 48% of all disabling injury claims, compared with 5.0% and 7.4%, respectively, among food service workers. Among workers aged 14 or 15, farm workers accounted for 39% and 29% of severe and disabling injury claims, respectively, compared with 13% and 31% for food service workers (Figure 1 b and c).

**Variation by Year and Season**

There is no consistent pattern of variation in claims for minors by year and occupation. However, among food service workers, the two youngest age categories have almost doubled their proportion of claims, from 6.4% in 1986 to 12.4% in 1989.

There is, however, considerable variation by season for all occupational categories, especially for farm workers (Figure 3). The summer quarter accounts for 68% of all farm worker claims, compared with 38% of all food service worker claims and 52% of all other claims. The summer quarter also represents a disproportionately high percentage of claims among the two youngest categories of children (13 years of age or younger, or 14 or 15 years of age), who together account for 36% of all farm worker claims, 11% of all food service worker claims, and 13% of all other occupational claims.

**Variation by Time of Day**

Figure 4 shows the distribution of claims by time of day (AM/PM) within season for the three occupational categories. Farm workers filed claims for injuries occurring in the morning 58.9% of the time, compared with only 21.3% for food service workers and 36.2% for all other occupa-

tional claimants. During the three seasons when school is in session (i.e., excluding summer), the percentage of farm worker claims filed for morning injuries ranged from 32.4% to 56.0%, compared with a range of 18.8% to 19.6% for food service workers and of 26.0% to 28.4% for all other occupational claimants.

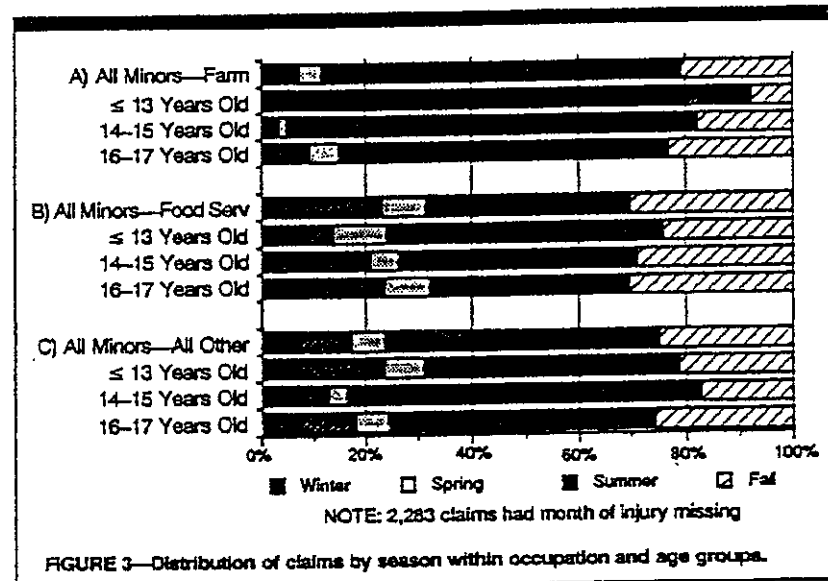
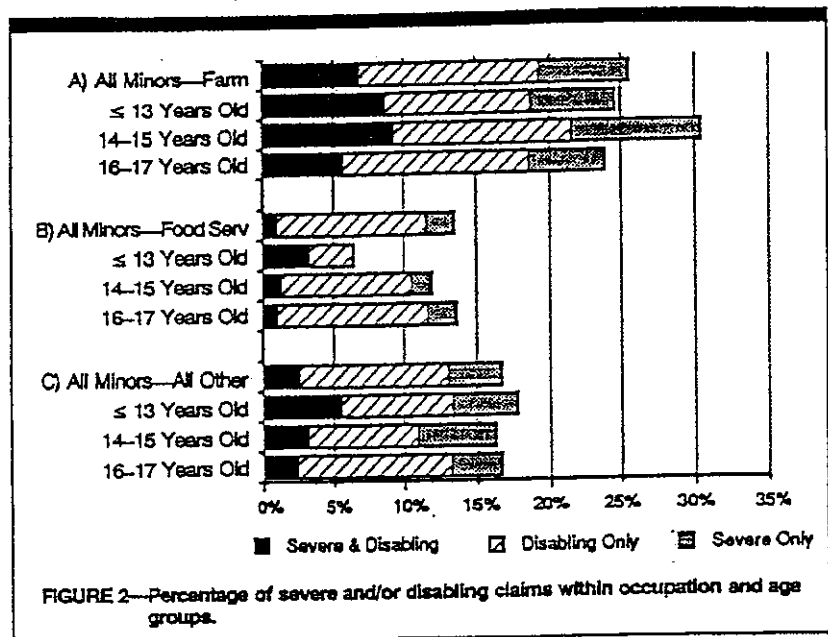
### Discussion

The descriptive information obtained from Washington State's workers' compensation data about farm injuries among minors must be viewed as preliminary, given that no rates could be developed owing to the lack of denominator data. However, the data are consistent with previous reports in demonstrating that injuries related to farm work tend to have high levels of severity and that a substantial number of these injuries is occurring among young children.<sup>4,7,11</sup>

The distribution of all injuries, and of serious injuries by age, was compared for minors in farm work, in food service, and in all other occupational categories. The proportion of total claims filed among minors aged 13 or younger and among minors aged 14 or 15 is greater for farm workers than for food service workers and all other workers. This could be due to either a greater percentage of young minors being employed as farm workers or a greater percentage of those young minors employed as farm workers being injured, or both.

Furthermore, the proportions of severe injury claims, disabling injury claims, and both severe and disabling injury claims are all much higher among farm workers in all age categories than among food service workers and all other workers. The proportion of serious injury claims is particularly high among farm workers aged 14 or 15 (more than 30% of all claims). The proportion of serious claims among minors engaged in farm work is twice that among those employed in food service or all other employment. Unless minors employed in food service and other nonfarm employment file twice as many claims overall as those employed in farm work, the unmeasured, underlying rate of serious claims among minors employed in farm work will be greater.

Independent of any assumptions, it is clear that farm work accounts for a considerable proportion of all claims, especially serious injury claims among children aged 13 or younger and among children aged 14 or 15. Farm workers account for 49% of serious injury claims (severe, disabling, or both) among children

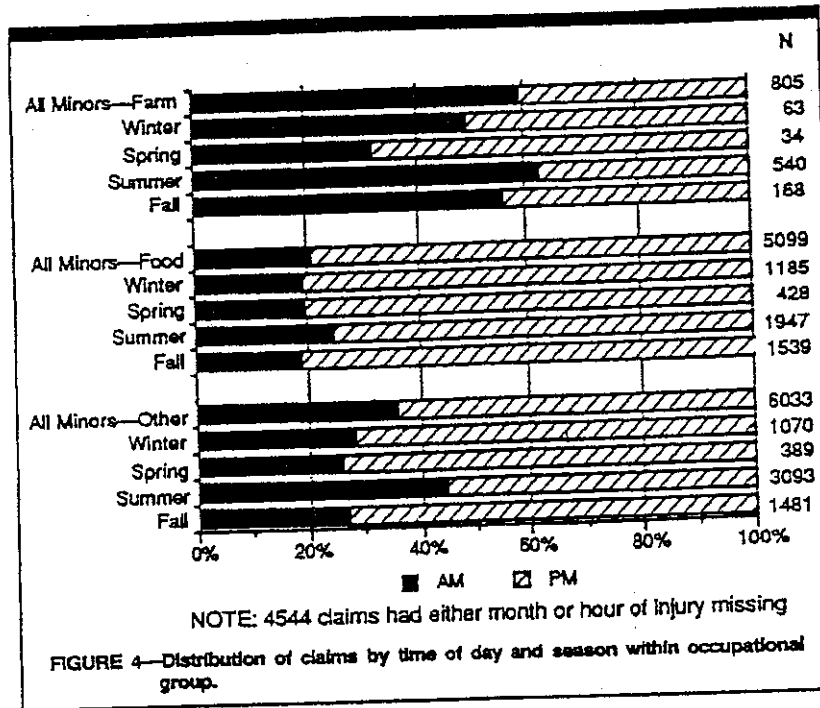


aged 13 years or younger and 30% of such claims for children aged 14 or 15.

Although no temporal trends for injury claims among farm worker minors could be identified, the proportion of claims among the two youngest categories of minors doing food service work nearly doubled between 1986 and 1989. This may represent that there has been a shift to younger employees or that more hazardous work is being performed by the youngest employees in the food service industry. This trend should be monitored.

The diurnal distribution of claims was also reviewed. A much greater percentage

of farm worker injuries occurred in the morning during the winter and fall months when compared with injuries for food service employment or all other employment (Figure 4). This high percentage of morning claims suggests that farm worker minors (1) are working long hours before going to school, (2) are at particularly high risk during preschool working hours, (3) are working during morning school hours, or (4) are engaged in some combination of the above. Further investigation in regard to these factors and their possible interaction with the perceived high rate of school dropouts or



failure among farm worker children<sup>16</sup> requires further critical appraisal.

Concern about the potentially negative impact of farm work on the health and school performance of minors is not new. The data presented here were generated in support of the rule-making process that is currently ongoing in Washington State concerning employment of minors. Rules recently adopted by the Department of Labor and Industries<sup>17</sup> exceed federal standards in many respects. The state will prohibit minors under age 14 (who are not members of the farm owner's family) from doing farm work except for summer hand harvesting and cultivation of four crops (berries, flower bulbs, cucumbers, and spinach). The regulations will limit the number of hours minors can work per day and per week, and they will prohibit the work minors can do during certain night and early morning hours.

Using workers' compensation data has several drawbacks. First, injuries are

likely to be underreported because only those injuries resulting in the filing of a claim are recorded. The underreporting is likely to be more severe for farm injuries than for other employment categories (especially food service, in which child labor is well established and occurs largely in well-supervised, national chains). Thus, the data presented here probably underestimate the farm injury problem. Second, the unavailability of data to directly evaluate rates of injuries among minors is of concern. The fact that worker hours are not reported for minors in general, and for farm worker minors in particular, is a major methodological problem in addressing the issues raised in this paper. □

#### Acknowledgments

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monies are targeted to reducing the incidence of and disability related to occupational injuries and illnesses.

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