



Fatal Unintentional Farm Injuries Among Persons Less than 20 Years of Age in the United States:

Geographic Profiles

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Department of Health and Human Services
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

NIOSH

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Among Persons Less Than 20 Years of Age
in the United States:**

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**DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health**

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Foreword

More than two million youth less than 20 years of age are potentially exposed to farm safety hazards each year—as farm residents, farm family workers, hired workers, children of migrant or seasonal workers, or farm visitors. Youth on farms may be exposed to a wide range of hazards, including machinery, electric current, firearms, bodies of water, grain storage facilities, and livestock. As a place of work and a place of residence, the farm presents unique challenges for injury prevention.

The NIOSH Childhood Agricultural Injury Prevention Initiative seeks to prevent farm injuries from work and nonwork-related exposures through a comprehensive program of surveillance, research, and partnership. In keeping with the breadth of the Initiative, this document presents data by state, Census region, and Census division for all youth fatalities on U.S. farms between 1982 and 1996. These data, drawn from the Vital Statistics Mortality files of the National Center for Health Statistics, indicate that nearly 2,200 youth were fatally injured on farms during this 15-year period, and that the leading causes of death varied considerably across geographic areas.

Although farm fatalities among youth have decreased markedly over the years, the toll remains too high. We hope this document will serve as a valuable resource to government agencies at all levels, policy makers, health and safety professionals and farm safety advocates in their efforts to develop focused and coordinated strategies to prevent youth injuries on farms.



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Public Health Summary

What are the hazards?

According to data from the National Center for Health Statistics Mortality Data files, nearly 2,200 youth less than 20 years of age died of unintentional injuries (excluding transportation-related events) on farms in the United States between 1982 and 1996. Major causes of unintentional death on farms include farm machinery, drowning, and firearms. Together, these three causes accounted for 73% of the fatalities reported.

How can youth be exposed or put at risk?

Exposure to farm hazards is not limited to youth who are employed on farms. Youth can be fatally injured during work activities, while living on farms, while visiting farms, or when they accompany their working parents or adults into the fields. These various exposure sources make the farm a unique location for directing prevention strategies.

What recommendations has the federal government made to protect youth's health?

The Fair Labor Standards Act of 1938 (FLSA) and its amendments set standards for child labor in agriculture. However, FLSA covers only employees whose work involves production of agricultural goods which will leave the state through interstate commerce. While the FLSA specifically prohibits certain types of dangerous work (termed Hazardous Orders) by youth, these regulations do not apply to minors who are employed by their parents or a guardian on a farm owned or operated by their parent or a guardian.

Data that can be used to target injury prevention efforts are accumulating. NIOSH and other federal agencies encourage the use of these data to develop targeted prevention strategies. Additionally, NIOSH is conducting evaluations of prevention strategies to ensure that resources are applied effectively.

Where can more information be found?

New research efforts addressing childhood agricultural and farm injuries are underway at NIOSH and other organizations, and this information will be disseminated as soon as it becomes available. Additional information can be obtained through the NIOSH toll-free number or Website:

1-800-35-NIOSH
(800-356-4674)
www.cdc.gov/niosh



Fatal Unintentional Farm Injuries Among Persons Less Than 20 Years of Age in the United States:

Geographic Profiles

Introduction

Each year on farms in the United States, an alarming number of youth less than 20 years of age are killed, injured, or permanently disabled. Children's involvement on farms is unique because youth not only actively work from an early age, but live and play on farms. Children are exposed to safety hazards from farm machinery, livestock, agricultural chemicals, structures, and bodies of water. Electrical hazards and firearms may also be present on farms.

Twenty-seven percent of the 4.6 million farm residents in the United States are youth less than 20 years old.¹ Farm residents make up the largest population of youth exposed to farm safety hazards. However, relatives and friends of farm families, hired farm workers, or migrant workers may also be present on farms and exposed to similar hazards. Youth may also be involved in recreational activities on farms that expose them to safety hazards. Although the exact number of youth exposed to farm hazards annually is unknown, it has been estimated at more than two million.²

National data on fatal farm injuries occurring to youth and adolescents in the United States are limited. Data from the National Center for Health Statistics (NCHS) indicate that from 1979 through 1981, an average of 300 youth died on farms annually. Farm machines caused one-third of these deaths among youth less than 20 years old, and were responsible for half the deaths among youth under 10 years of age.³ A similar analysis for the years 1991 through 1993 demonstrates that fatal injuries on farms were reduced to 104 deaths annually, but the substantial contribution of farm machinery to these deaths did not change. Drowning incidents accounted for one-fourth of the total deaths, and one-third of the deaths among youth less than 5 years old.⁴

Few state-specific studies of fatal farm injuries of youth have been conducted.⁵⁻¹⁰ To prevent fatal farm injuries of youth in the United States, it is important to identify the leading causes of fatal injuries at the national level to guide broad-based prevention efforts. In addition, identifying the major causes of death at the regional and state level will guide efforts by state and community groups to address specific problems in their areas. Throughout the United States, geographic differences exist in agricultural populations, practices, and production. Additionally, exposure patterns differ among states, and also vary among population groups within the states. To date, regional and state-level data on childhood farm injuries in the United States have not been published. By addressing this gap, the data in this report may help policy makers, safety advocates, and the general public become more aware of major childhood farm safety issues in their states and regions, and may be useful to stakeholders as they develop prevention strategies specific to their needs.



Methodology

This document is a summary of fatal farm injuries to persons less than 20 years of age as reported in the National Center for Health Statistics (NCHS) Mortality Data from 1982 through 1996.¹¹ Fatal farm injuries are defined in this report as those which occurred on farms, regardless of production agriculture involvement. These injuries include those sustained during chores, paid work, or recreational activities such as hunting and swimming.

The NCHS Mortality Data were compiled from state death certificates filed from the Vital Statistics Offices in the United States. The edited data files included decedent demographics, geographic data, and information on the cause and physical location of death. Deaths to youth less than 20 years of age that occurred at a farm location were selected. NCHS data were coded according to the International Classification of Diseases codes (ICD-9)¹² for location and underlying external cause of death. ICD-9 codes ranging from E850 through E869 and E880 through E928 were the only E codes recorded in the data files. Intentional deaths (E950-E969) and transportation events (E800-E848) could not be identified in the data files because the ICD-9 guidelines excluded location of death for these events (cases were not coded, regardless of the location of death). However, because tractors are considered machinery, tractor-related deaths that occurred on the farm were included in this study. Events that occurred in the farm house or home premises of the farm were not identified as farm fatalities in the NCHS data files because the ICD-9 guidelines require they be classified as occurring at home. In addition, any fatalities that may have been misclassified in the original source document were excluded. Therefore, the number of farm fatalities reported in this document is considered conservative. The NCHS data do not distinguish between work and nonwork-related deaths, but include all fatalities on farms.

The Bureau of Census categorizes the nation into Census regions and Census divisions. NCHS data files follow this format. Specifically, there are four Census regions: West Region, Midwest Region, South Region, and the Northeast Region. Within the Census regions there are nine Census divisions: New England, Middle Atlantic, South Atlantic, East North Central, West North Central, East South Central, West South Central, Mountain, and Pacific. For the United States and Census regions, data are displayed in shade maps, tables, and figures by gender, age group, and cause of death. Additional tables summarize data for states and Census divisions. Individual cause-of-death profiles are provided, over the 15-year period, for states with at least ten deaths.

Lack of adequate state data on the number of youth exposed to farm hazards precludes assessment of risk and state-by-state comparisons. Therefore, the number of farm fatalities in this document for individual states should not be construed as a measure of risk.

Interpretation of Data

Caution should be exercised in interpreting the data presented in this document. The striking decreases in the frequency of farm fatalities among youth may be attributed to multiple factors, and do not necessarily reflect a similar reduction in risk. Changes in farm resident population, as well as improvements in equipment design, medical care, and educational programs may all have contributed to the decline in fatalities.

The farm-resident population has decreased steadily over the years, according to Bureau of Census reports (the farm resident population estimates were last published in 1991). According to these reports, between 1982 and 1991, the youth farm resident population decreased by 28%, for an average decrease of about 4% per year.^{1,13-21} Statistics published by the United States Department of Agriculture (USDA) also indicated a decline in the number of farms and farm residents.²² Because the farm population has decreased, it is possible that smaller numbers of youth are exposed to farm hazards.

In addition to reductions in farm population, there has been an improvement in emergency medical and trauma care in rural areas.⁴ The use of safer farm machinery (e.g., tractors and other machines with rollover protective structures (ROPS) installed) has increased.^{4,23} Educational campaigns directed at farming communities, such as the Farm Safety Day Camps, FFA, and the 4-H programs, have been well received²³ and more farm youth may be participating in farm machinery safety classes.²³

Data Summary

- Between 1982 and 1996, there were 2,174 farm deaths among youth less than 20 years of age.
- During 1982-1989, there were an average 181 deaths to youth on farms annually, decreasing to an average 103 deaths between 1990-1996. The average annual number of deaths decreased 43% between 1982-1989 and 1990-1996.
- About one out of every three farm deaths among youth occurred between the ages of 15 and 19.
- Males accounted for 85.2% of the fatal farm injuries to youth less than 20 years of age.
- Females accounted for more than 20% of deaths in the age groups 0-4 years and 5-9 years.
- Nearly 40% of the deaths among males were between the ages of 15 and 19, while nearly 40% of the deaths among females occurred before age 5.
- Farm machinery (including tractors), drowning, and firearm-related deaths represented 73% of fatal farm injuries to youth.
- Farm machinery-related deaths were the leading cause of death, accounting for 36% of deaths to youth less than 20. Thirty percent of farm machinery-related deaths were among children less than 5 years of age. Machinery was the leading cause of farm deaths in 29 states.
- The average annual number of farm machinery-related deaths decreased 60% between 1982-1989 and 1990-1996 among youth 15-19 years of age. The smallest decrease (33%) was among youth 5-9 years of age.
- Drowning was the second leading cause of death on farms (27%), with children less than 5 years of age accounting for 32% of the deaths. Drowning was the leading cause of farm deaths in 17 states.
- Between 1982-1989 and 1990-1996, the greatest decrease in the average annual number of drowning-related farm fatalities (64%) was among youth 10-14 years of age.
- Firearms accounted for 11% of the fatal farm injuries, with slightly more than half of the firearms deaths reported among youth 15-19 years of age (58%). Firearms were the leading cause of death in two states (Alabama and Wyoming).
- Between 1982-1989 and 1990-1996, the greatest decline in the average annual number of firearms-related farm fatalities (57%) was seen in youth 10-14 years of age. The decrease noted among youth 15-19 years of age between these time periods was 36%.
- For deaths attributed to machinery, drowning, and animals, the greatest numbers of deaths occurred among children under 5 years of age. The greatest numbers of deaths from mechanical suffocation occurred between ages 10 and 14, with firearms and electrocution deaths most common between ages 15 and 19.

- Two regions, the South Region and the Midwest Region, accounted for 79% of the fatal farm injuries.
- The greatest proportions of deaths in the Northeast Region and the West Region were among youth 0-4 years. In the Midwest Region and the South Region, the greatest proportions were among youth 15-19 years.
- The average annual number of fatal farm injuries among youth declined across all regions between 1982-1989 and 1990-1996. Among the regions, overall levels of decline varied, and were also inconsistent across age groups.
- In general, regional declines in machinery-related deaths were greatest among youth 15-19 years of age, and smallest among youth 5-9 years of age.
- Texas reported the most fatal injuries (204 deaths), representing 9.4% of the total.
- Five states reported 100 or more deaths each (Iowa, Missouri, Pennsylvania, Texas, and Wisconsin).
- Twenty-two states reported 40 or more farm deaths to youth during this period (Arkansas, California, Colorado, Georgia, Idaho, Indiana, Illinois, Iowa, Kansas, Kentucky, Missouri, Minnesota, Mississippi, Michigan, North Carolina, Ohio, Oklahoma, Pennsylvania, South Dakota, Tennessee, Texas, and Wisconsin).

Prevention of Childhood Farm Fatalities

In recent years, significant progress has been made in reducing farm injuries and fatalities.^{4,23} Progress has been attributed to more widespread use of ROPS, improved emergency care in rural areas, certification of youth 14-15 years of age in the operation of farm machinery, and general educational efforts geared toward farm safety. However, despite progress made in recent years, the toll of farm fatalities among youth remains high. Further, as this document demonstrates, declines have not been uniformly strong in all geographic areas or age groups, or for all causes of death.

Strategies that have been suggested for prevention of childhood farm fatalities have several recurring themes: the importance of separating children from injury hazards; the need for adult supervision; and the need for adults present to take responsibility for assessing safety risks to children and youth and eliminating hazards. In general, prevention programs for specific types of injuries take each of these dimensions into account.

For example, strategies recommended for preventing deaths associated with farm machinery include providing enclosed play spaces for young children away from work areas; checking a work area for the presence and location of children before starting to operate any machinery; evaluating youth's maturity, knowledge, and physical abilities to operate machinery before assigning a chore or work task; and ensuring that youth adhere to standard safety practices such as using seat belts on ROPS-equipped tractors.⁹⁻¹⁰ Elements of a drowning prevention program may include erecting barriers to separate children from ponds or other drowning hazards; supervising children at all times when they are near a body of water; and permitting youth to swim only when another person is present.²⁴ A variety of agencies and organizations, including those listed in the section entitled "Additional Resources" on page 11, can provide further information about prevention of childhood injuries and fatalities on farms.

While numerous promising prevention strategies have been developed and implemented, few have been formally evaluated to date. NIOSH is actively pursuing such evaluations through its Childhood Agricultural Injury Prevention Initiative. Results of these rigorous evaluations will be invaluable in developing future interventions. However, at present, there is a critical need to use existing information to guide prevention efforts focused on farm fatalities among children and youth.



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Additional Resources

NOTE: *The addresses below were correct as of June, 2001. Since Internet addresses for Web sites change frequently, readers are cautioned that slight changes may have taken place since that time.*

Centers for Agricultural Disease and Injury Research, Education and Prevention
National Institute for Occupational Safety and Health
Phone: (304) 285-5749
www.cdc.gov/niosh/agctrhom.html

Farm Safety Program
Cooperative State Research Education and Extension Service
U.S. Department of Agriculture
Phone: (202) 401-0151
www.reeusda.gov/pas/AGSYS/FARMSAFE/Farmsafe.htm

Employment Standards Administration, Wage and Hour Division
U.S. Department of Labor
Phone: (866) 487-9243
www.dol.gov/dol/esa

Farm Safety 4 Just Kids
Phone: (800) 423-5437 or (515) 758-2827
www.fs4jk.org

National Center for Injury Prevention and Control
Phone: (770) 488-1506
www.cdc.gov/ncipc/ncipchm.htm

National Children's Center for Rural and Agricultural Health and Safety
Phone: (888) 924-SAFE (7233)
www.marshfieldclinic.org/research/children

National FFA Organization
Phone: (317) 802-6060
www.ffa.org

National Institute for Occupational Safety and Health
Phone: (800) 356-7674
www.cdc.gov/niosh

National SAFE KIDS Campaign
www.safekids.org

National Safety Council, Agriculture Division
www.nsc.org/mem/agri.htm

North American Guidelines for Children's Agricultural Tasks (NAGCAT)
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Table 1. Fatal farm injuries to persons less than 20 years, by year and age group, United States, 1982-1996

| Year | 0 - 4 years | 5 - 9 years | 10 - 14 years | 15 - 19 years | Total |
|-------|-------------|-------------|---------------|---------------|-------|
| 1982 | 45 | 31 | 47 | 70 | 193 |
| 1983 | 51 | 38 | 65 | 97 | 251 |
| 1984 | 41 | 34 | 58 | 77 | 210 |
| 1985 | 59 | 38 | 37 | 76 | 210 |
| 1986 | 50 | 28 | 38 | 47 | 163 |
| 1987 | 40 | 30 | 36 | 46 | 152 |
| 1988 | 31 | 25 | 28 | 55 | 139 |
| 1989 | 30 | 35 | 26 | 41 | 132 |
| 1990 | 36 | 36 | 27 | 42 | 141 |
| 1991 | 29 | 25 | 21 | 29 | 104 |
| 1992 | 20 | 25 | 22 | 39 | 106 |
| 1993 | 29 | 13 | 26 | 33 | 101 |
| 1994 | 26 | 23 | 18 | 30 | 97 |
| 1995 | 20 | 17 | 16 | 28 | 81 |
| 1996 | 20 | 23 | 19 | 32 | 94 |
| Total | 527 | 421 | 484 | 742 | 2174 |

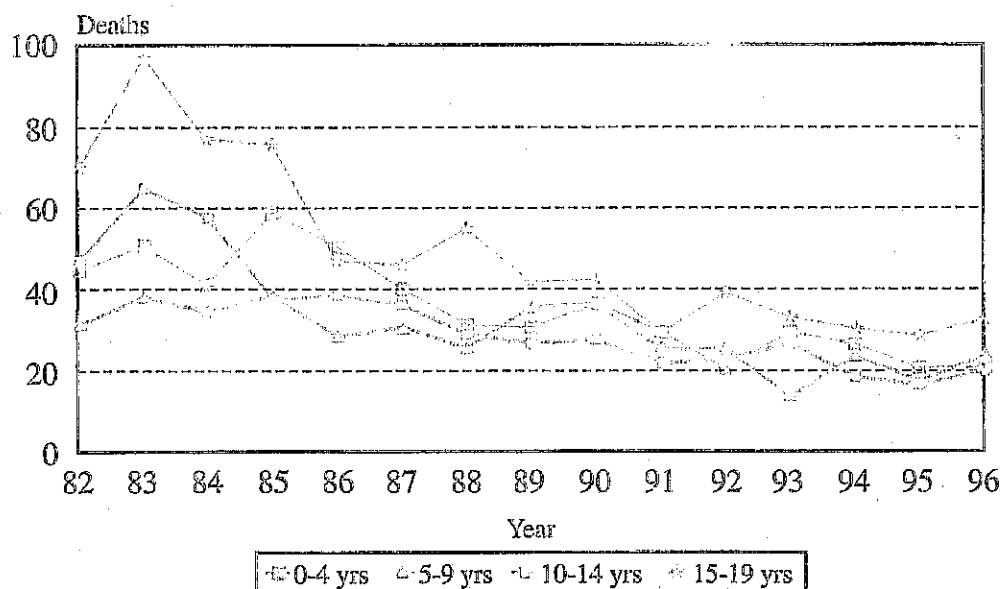


Figure 1. Trend of fatal farm injuries to persons less than 20 years, by age group, United States, 1982-1996 (N=2174)

Table 2. Fatal farm injuries to persons less than 20 years, by gender and age group, United States, 1982-1996

| Age Group | Male | Female | Total |
|--------------|-------------|------------|-------------|
| 0-4 years | 404 | 123 | 527 |
| 5-9 years | 327 | 94 | 421 |
| 10-14 years | 427 | 57 | 484 |
| 15-19 years | 695 | 47 | 742 |
| Total | 1853 | 321 | 2174 |

Table 3. Percentage change in average annual number of fatal farm injuries to persons less than 20 years, by age group, United States, 1982-1989 and 1990-1996

| All Causes of Death | 0 - 4 years | 5 - 9 years | 10 - 14 years | 15 -19 years | Total |
|---------------------|-------------|-------------|---------------|--------------|-------|
| 1982-1989 | 43 | 32 | 42 | 64 | 181 |
| 1990-1996 | 26 | 23 | 21 | 33 | 103 |
| % change | -40 | -28 | -50 | -48 | -43 |

Table 4. Causes of fatal farm injuries to persons less than 20 years, United States, 1982-1996

| Cause of Death | Number | Percent |
|---|-------------|--------------|
| Machinery (E919) | 773 | 35.6 |
| Drowning (E910) | 585 | 26.9 |
| Firearms (E922) | 237 | 10.9 |
| Struck by or against/caught in or between objects (E916-E918) | 109 | 5.0 |
| Mechanical suffocation (E911-E913) | 107 | 4.9 |
| Injury caused by animals (E905-E906) | 82 | 3.7 |
| Electric current (E925) | 78 | 3.6 |
| Falls (E880-E888) | 69 | 3.2 |
| Nature/environment (E900-E904, E907-E909) | 43 | 2.0 |
| Accidental poisoning (E850-E869) | 23 | 1.1 |
| Fire & flames (E890-E899) | 22 | 1.0 |
| All other causes (E920, E921, E923, E924, E928) | 46 | 2.1 |
| All causes of death (E850-E869 and E880-E928) | 2174 | 100.0 |

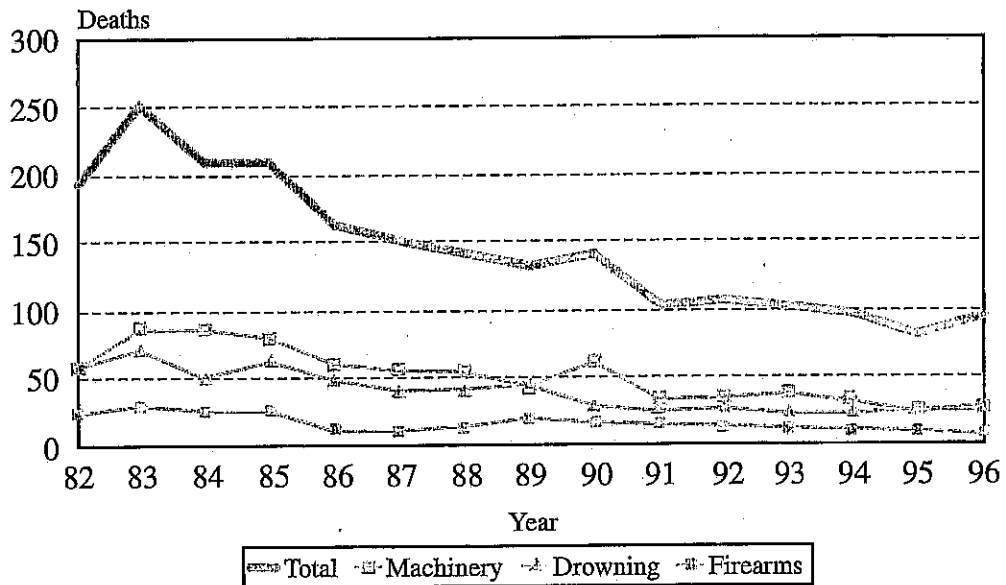


Figure 2. Trend of the leading causes of fatal farm injuries to persons less than 20 years, United States, 1982-1996

Table 5. Causes of fatal farm injuries to persons less than 20 years, by gender, United States, 1982-1996

| Cause of Death | Male | Female | Total |
|---|------|--------|-------|
| Machinery (E919) | 658 | 115 | 773 |
| Drowning (E910) | 500 | 85 | 585 |
| Firearms (E922) | 226 | 11 | 237 |
| Struck by or against/caught in or between objects (E916-E918) | 91 | 18 | 109 |
| Mechanical suffocation (E911-E913) | 100 | 7 | 107 |
| Injury caused by animals (E905-E906) | 50 | 32 | 82 |
| Electric current (E925) | 69 | 9 | 78 |
| Falls (E880-E888) | 55 | 14 | 69 |
| Nature/environment (E900-E904, E907-E909) | 31 | 12 | 43 |
| Accidental poisoning (E850-E869) | 17 | 6 | 23 |
| Fire & flames (E890-E899) | 16 | 6 | 22 |
| All other causes (E920,E921,E923,E924,E928) | 40 | 6 | 46 |
| All causes of death (E850-E869 and E880-E928) | 1853 | 321 | 2174 |

**Table 6. Causes of fatal farm injuries to persons less than 20 years, by age group,
United States, 1982-1996**

| Cause of Death | 0 - 4 years | 5 - 9 years | 10 - 14 years | 15 - 19 years | Total |
|--|------------------------|------------------------|--------------------------|--------------------------|--------------|
| Machinery (E919) | 229 | 188 | 141 | 215 | 773 |
| Drowning (E910) | 186 | 108 | 118 | 173 | 585 |
| Firearms (E922) | 9 | 15 | 76 | 137 | 237 |
| Struck by or against/caught in or between objects (E916-E918) | 30 | 29 | 22 | 28 | 109 |
| Mechanical suffocation (E911-E913) | 11 | 20 | 49 | 27 | 107 |
| Injury caused by animals (E905-E906) | 29 | 22 | 19 | 12 | 82 |
| Electric current (E925) | 4 | 4 | 20 | 50 | 78 |
| Falls (E880-E888) | 12 | 17 | 16 | 24 | 69 |
| Nature/environment (E900-E904, E907-E909) | 5 | 2 | 6 | 30 | 43 |
| Accidental poisoning (E850-E869) | 2 | 0 | 4 | 17 | 23 |
| Fire & flames (E890-E899) | 3 | 7 | 4 | 8 | 22 |
| All other causes (E920, E921, E923, E924, E928) | 7 | 9 | 9 | 21 | 46 |
| All causes of death (E850-E869 and E880-E928) | 527 | 421 | 484 | 742 | 2174 |

Table 7. Causes of fatal farm injuries to males less than 20 years, by age group, United States, 1982-1996

| Cause of Death | 0-4 years | 5-9 years | 10-14 years | 15-19 years | Total |
|--|----------------------|----------------------|------------------------|------------------------|--------------|
| Machinery (E919) | 174 | 154 | 125 | 205 | 658 |
| Drowning (E910) | 149 | 82 | 101 | 168 | 500 |
| Firearms (E922) | 8 | 12 | 74 | 132 | 226 |
| Mechanical suffocation (E911-E913) | 10 | 16 | 47 | 27 | 100 |
| Struck by or against/caught in or between objects (E916-E918) | 23 | 21 | 19 | 28 | 91 |
| Electric current (E925) | 3 | 3 | 19 | 44 | 69 |
| Falls (E880-E888) | 9 | 12 | 14 | 20 | 55 |
| Injury caused by animals (E905-E906) | 17 | 14 | 9 | 10 | 50 |
| Nature/environment (E900-E904, E907-E909) | 1 | 1 | 5 | 24 | 31 |
| Accidental poisoning (E850-E869) | 2 | 0 | 4 | 11 | 17 |
| Fire & flames (E890-E899) | 2 | 5 | 2 | 7 | 16 |
| All other causes (E920, E921, E923, E924, E928) | 6 | 7 | 8 | 19 | 40 |
| All causes of death (E850-E869 and E880-E928) | 404 | 327 | 427 | 695 | 1853 |

Table 8. Causes of fatal farm injuries to females less than 20 years, by age group, United States, 1982-1996

| Cause of Death | 0 - 4 years | 5 - 9 years | 10 - 14 years | 15 - 19 years | Total |
|---|--------------------|--------------------|----------------------|----------------------|--------------|
| Machinery (E919) | 55 | 34 | 16 | 10 | 115 |
| Drowning (E910) | 37 | 26 | 17 | 5 | 85 |
| Injury caused by animals (E905-E906) | 12 | 8 | 10 | 2 | 32 |
| Struck by or against/caught in or between objects (E916-E918) | 7 | 8 | 3 | 0 | 18 |
| Falls (E880-E888) | 3 | 5 | 2 | 4 | 14 |
| Nature/environment (E900-E904, E907-E909) | 4 | 1 | 1 | 6 | 12 |
| Firearms (E922) | 1 | 3 | 2 | 5 | 11 |
| Electric current (E925) | 1 | 1 | 1 | 6 | 9 |
| Mechanical suffocation (E911-E913) | 1 | 4 | 2 | 0 | 7 |
| Accidental poisoning (E850-E869) | 0 | 0 | 0 | 6 | 6 |
| Fire & flames (E890-E899) | 1 | 2 | 2 | 1 | 6 |
| All other causes (E920, E921, E923, E924, E928) | 1 | 2 | 1 | 2 | 6 |
| All causes of death (E850-E869 and E880-E928) | 123 | 94 | 57 | 47 | 321 |

Table 9. Percentage change in average annual number of fatal farm injuries to persons less than 20 years due to machinery, drowning, and firearms, by age group, United States, 1982-1989 and 1990-1996

| Cause of Death | 0 - 4 years | 5 - 9 years | 10 - 14 years | 15 - 19 years | Total |
|-------------------|-------------|-------------|---------------|---------------|-------|
| Machinery: | | | | | |
| 1982-1989 | 19 | 15 | 12 | 20 | 65 |
| 1990-1996 | 11 | 10 | 7 | 8 | 36 |
| % change | -42 | -33 | -42 | -60 | -45 |
| Drowning: | | | | | |
| 1982-1989 | 16 | 9 | 11 | 15 | 52 |
| 1990-1996 | 8 | 5 | 4 | 8 | 25 |
| % change | -50 | -44 | -64 | -47 | -52 |
| Firearms: | | | | | |
| 1982-1989 | <1 | 1 | 7 | 11 | 20 |
| 1990-1996 | <1 | <1 | 3 | 7 | 11 |
| % change | -- | -- | -57 | -36 | -45 |

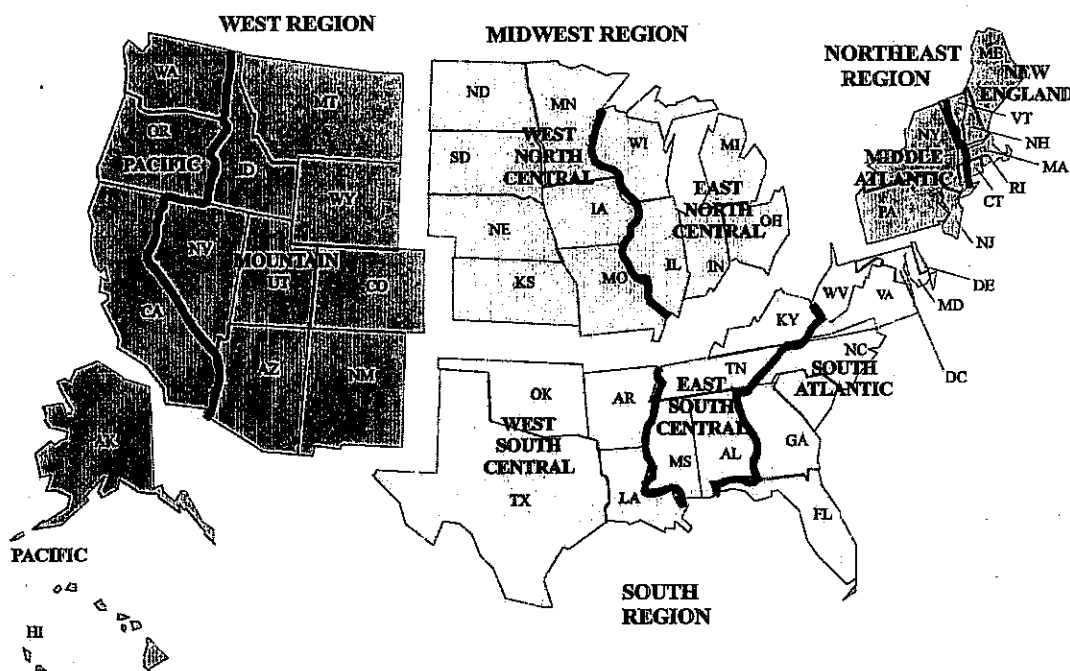


Figure 3. Map of the United States showing Census regions, Census divisions, and states

Table 10. Fatal farm injuries to persons less than 20 years, by Census region and age group, United States, 1982-1996

| Region | 0 - 4 years | 5 - 9 years | 10 - 14 years | 15 -19 years | Total |
|-----------|-------------|-------------|---------------|--------------|-------|
| Northeast | 58 | 30 | 41 | 50 | 179 |
| Midwest | 228 | 178 | 168 | 270 | 844 |
| South | 147 | 162 | 217 | 337 | 863 |
| West | 94 | 51 | 58 | 85 | 288 |
| Total | 527 | 421 | 484 | 742 | 2174 |

Table 11. Percentage change in average annual number of fatal farm injuries to persons less than 20 years from all causes, by age group, Northeast Region, 1982-1989 and 1990-1996

| All Causes of Death | 0 - 4 years | 5 - 9 years | 10 - 14 years | 15 -19 years | Total |
|---------------------|-------------|-------------|---------------|--------------|-------|
| 1982-1989 | 4 | 2 | 3 | 4 | 14 |
| 1990-1996 | 4 | 2 | 2 | 2 | 10 |
| % change | -- | -- | -33 | -50 | -29 |

Table 12. Percentage change in average annual number of fatal farm injuries to persons less than 20 years due to machinery, by age group, Northeast Region, 1982-1989 and 1990-1996

| Cause of Death | 0 - 4 years | 5 - 9 years | 10 - 14 years | 15 -19 years | Total |
|----------------|-------------|-------------|---------------|--------------|-------|
| Machinery: | | | | | |
| 1982-1989 | 2 | 1 | 1 | 2 | 6 |
| 1990-1996 | 2 | 1 | 1 | <1 | 4 |
| % change | -- | -- | -- | -- | -33 |

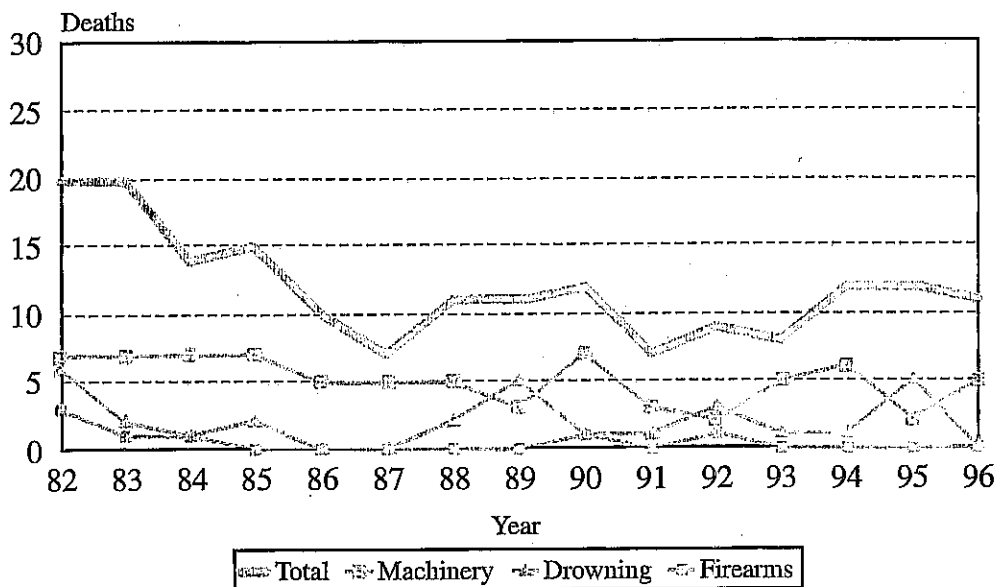


Figure 4. Trend of the leading causes of fatal farm injuries to persons less than 20 years, Northeast Region, 1982-1996 (N=179)

Table 13. Percentage change in average annual number of fatal farm injuries to persons less than 20 years from all causes, by age group, Midwest Region, 1982-1989 and 1990-1996.

| All Causes of Death | 0 - 4 years | 5 - 9 years | 10 - 14 years | 15 -19 years | Total |
|---------------------|-------------|-------------|---------------|--------------|-------|
| 1982-1989 | 19 | 13 | 14 | 23 | 69 |
| 1990-1996 | 10 | 10 | 8 | 12 | 41 |
| % change | -47 | -23 | -43 | -48 | -41 |

Table 14. Percentage change in average annual number of fatal farm injuries to persons less than 20 years due to machinery and drowning, by age group, Midwest Region, 1982-1989 and 1990-1996

| Cause of Death | 0 - 4 years | 5 - 9 years | 10 - 14 years | 15 -19 years | Total |
|-------------------|-------------|-------------|---------------|--------------|-------|
| Machinery: | | | | | |
| 1982-1989 | 11 | 8 | 5 | 6 | 30 |
| 1990-1996 | 6 | 6 | 3 | 3 | 17 |
| % change | -45 | -25 | -40 | -50 | -43 |
| Drowning: | | | | | |
| 1982-1989 | 5 | 2 | 2 | 4 | 13 |
| 1990-1996 | 3 | 1 | <1 | 2 | 7 |
| % change | -40 | -50 | -- | -50 | -46 |

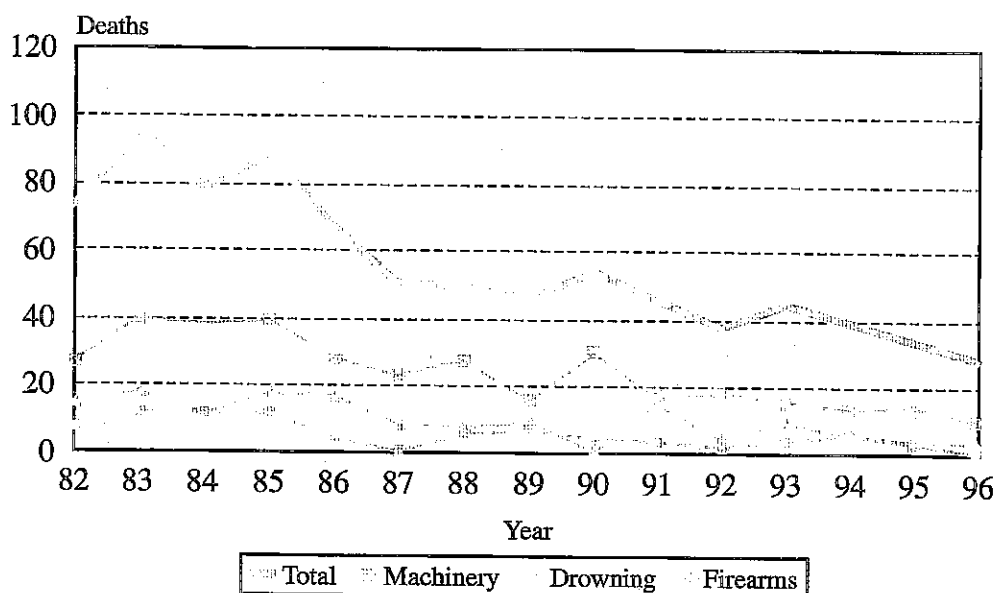


Figure 5. Trend of the leading causes of fatal farm injuries to persons less than 20 years, Midwest Region, 1982-1996 (N=864)

Table 15. Percentage change in average annual number of fatal farm injuries to persons less than 20 years from all causes, by age group, South Region, 1982-1989 and 1990-1996

| All Causes of Death | 0 - 4 years | 5 - 9 years | 10 - 14 years | 15 -19 years | Total |
|---------------------|-------------|-------------|---------------|--------------|-------|
| 1982-1989 | 12 | 13 | 20 | 30 | 75 |
| 1990-1996 | 7 | 8 | 8 | 14 | 38 |
| % change | -42 | -38 | -60 | -53 | -49 |

Table 16. Percentage change in average annual number of fatal farm injuries to persons less than 20 years due to machinery and drowning, by age group, South Region, 1982-1989 and 1990-1996

| Cause of Death | 0 - 4 years | 5 - 9 years | 10 - 14 years | 15 -19 years | Total |
|-------------------|-------------|-------------|---------------|--------------|-------|
| Machinery: | | | | | |
| 1982-1989 | 4 | 4 | 3 | 9 | 21 |
| 1990-1996 | 2 | 3 | 2 | 2 | 9 |
| % change | -50 | -25 | -50 | -78 | -57 |
| Drowning: | | | | | |
| 1982-1989 | 6 | 6 | 9 | 10 | 30 |
| 1990-1996 | 3 | 2 | 3 | 5 | 14 |
| % change | -50 | -67 | -67 | -50 | -53 |

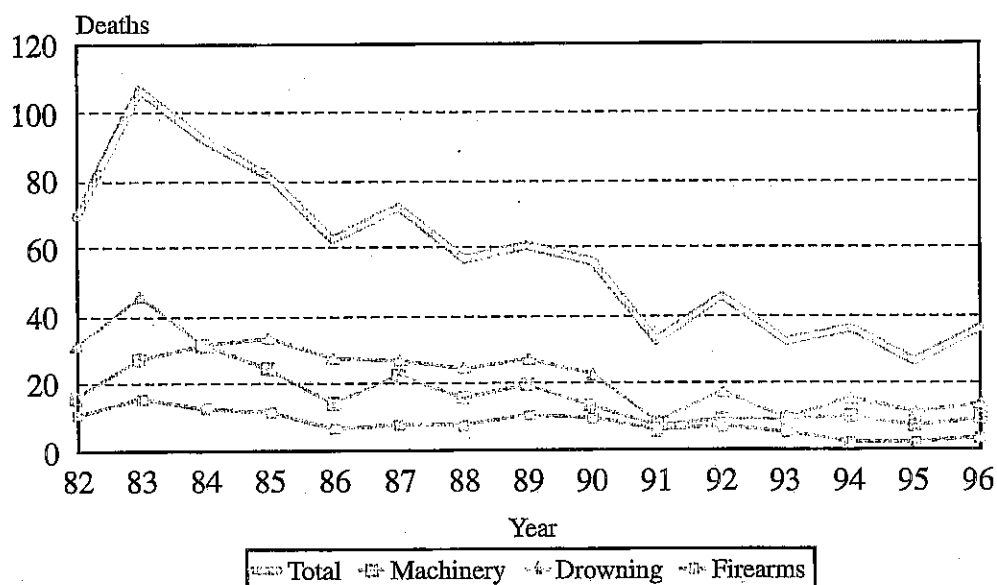


Figure 6. Trend of the leading causes of fatal farm injuries to persons less than 20 years, South Region, 1982-1996 (N=863)

Table 17. Percentage change in average annual number of fatal farm injuries to persons less than 20 years from all causes, by age group, West Region, 1982-1989 and 1990-1996

| All Causes of Death | 0 - 4 years | 5 - 9 years | 10 - 14 years | 15 -19 years | Total |
|---------------------|-------------|-------------|---------------|--------------|-------|
| 1982-1989 | 8 | 4 | 5 | 7 | 24 |
| 1990-1996 | 5 | 3 | 3 | 4 | 14 |
| % change | -38 | -25 | -40 | -43 | -42 |

Table 18. Percentage change in average annual number of fatal farm injuries to persons less than 20 years due to machinery, by age group, West Region, 1982-1989 and 1990-1996

| Cause of Death | 0 - 4 years | 5 - 9 years | 10 - 14 years | 15 -19 years | Total |
|----------------|-------------|-------------|---------------|--------------|-------|
| Machinery: | | | | | |
| 1982-1989 | 2 | 2 | 2 | 3 | 8 |
| 1990-1996 | 1 | 1 | 1 | 2 | 5 |
| % change | -50 | -50 | -50 | -33 | -38 |

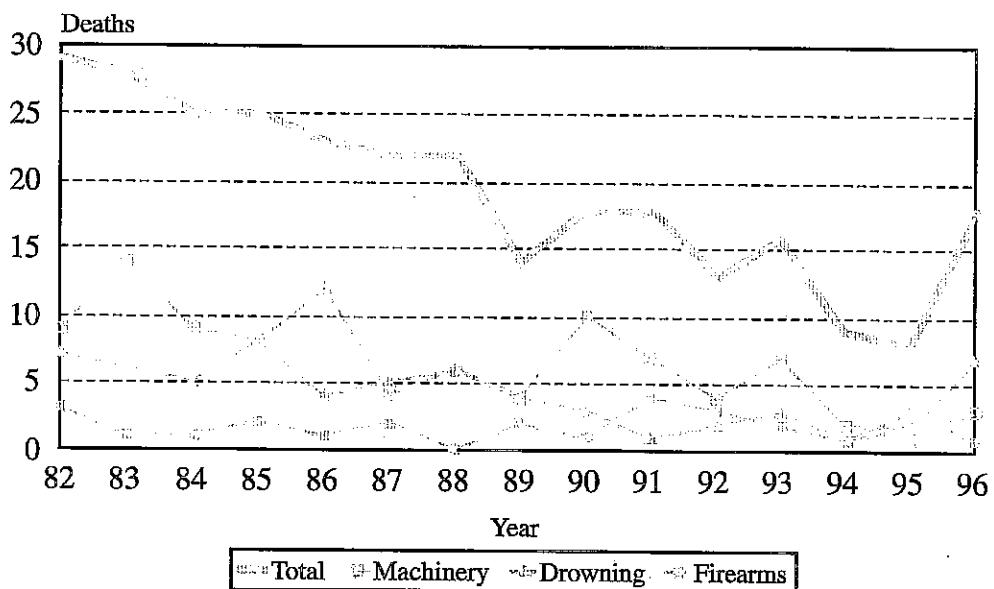


Figure 7. Trend of the leading causes of fatal farm injuries to persons less than 20 years, West Region, 1982-1996 (N=288)

Table 19. Fatal farm injuries to persons less than 20 years, by Census division and gender, United States, 1982-1996

| Census Division | | Male | Female | Total |
|-----------------|--------------------|------|--------|-------|
| Northeast: | New England | 14 | 11 | 25 |
| | Middle Atlantic | 124 | 30 | 154 |
| Midwest: | East North Central | 344 | 46 | 390 |
| | West North Central | 381 | 73 | 454 |
| South: | South Atlantic | 262 | 32 | 294 |
| | East South Central | 194 | 28 | 222 |
| | West South Central | 292 | 55 | 347 |
| West: | Mountain | 154 | 29 | 183 |
| | Pacific | 88 | 17 | 105 |
| Total | | 1853 | 321 | 2174 |

Table 20. Fatal farm injuries to persons less than 20 years, by age group and Census division, United States, 1982-1996

| Census Division | 0 - 4 years | 5 - 9 years | 10 -14 years | 15 -19 years | Total |
|--------------------|-------------|-------------|--------------|--------------|-------|
| New England | 7 | 4 | 4 | 10 | 25 |
| Middle Atlantic | 51 | 26 | 37 | 40 | 154 |
| East North Central | 102 | 85 | 74 | 129 | 390 |
| West North Central | 126 | 93 | 94 | 141 | 454 |
| South Atlantic | 43 | 54 | 83 | 114 | 294 |
| East South Central | 29 | 40 | 57 | 96 | 222 |
| West South Central | 75 | 68 | 77 | 127 | 347 |
| Mountain | 67 | 34 | 39 | 43 | 183 |
| Pacific | 27 | 17 | 19 | 42 | 105 |
| Total | 527 | 421 | 484 | 742 | 2174 |

Table 21. Causes of fatal farm injuries to persons less than 20 years, by Census division, United States, 1982-1996

| Cause of Death | New England | Middle Atlantic | East North Central | West North Central | South Atlantic |
|--|-------------|-----------------|--------------------|--------------------|----------------|
| Machinery (E919) | 9 | 67 | 183 | 182 | 88 |
| Drowning (E910) | 5 | 25 | 62 | 92 | 112 |
| Firearms (E922) | 0 | 7 | 38 | 53 | 32 |
| Mechanical suffocation (E911-E913) | 2 | 10 | 25 | 32 | 11 |
| Struck by or against/caught in or between objects (E916-E918) | 0 | 7 | 25 | 26 | 13 |
| Injury caused by animals (E905-E906) | 0 | 8 | 10 | 12 | 9 |
| Electric current (E925) | 2 | 4 | 13 | 17 | 6 |
| Falls (E880-E888) | 1 | 16 | 11 | 8 | 9 |
| All other causes (E850-E869, E890-E899, E900-E904, E907-E909, E920-E924, E928) | 3 | 8 | 23 | 32 | 12 |
| All causes of death (E850-E869 and E880-E928) | 25 | 154 | 390 | 454 | 294 |

Table 21 (Continued). Causes of fatal farm injuries to persons less than 20 years, by Census division, United States, 1982-1996

| Cause of Death | South Central | West South Central | Mountain | Pacific | Total |
|--|---------------|--------------------|----------|---------|-------|
| Machinery (E919) | 58 | 85 | 55 | 46 | 773 |
| Drowning (E910) | 93 | 132 | 44 | 20 | 585 |
| Firearms (E922) | 33 | 47 | 21 | 6 | 237 |
| Mechanical suffocation (E911-E913) | 5 | 11 | 7 | 4 | 107 |
| Struck by or against/caught in or between objects (E916-E918) | 10 | 8 | 13 | 7 | 109 |
| Injury caused by animals (E905-E906) | 4 | 20 | 14 | 5 | 82 |
| Electric current (E925) | 3 | 18 | 9 | 6 | 78 |
| Falls (E880-E888) | 6 | 3 | 10 | 5 | 69 |
| All other causes (E850-E869, E890-E899, E900-E904, E907-E909, E920-E924, E928) | 6 | 21 | 9 | 6 | 134 |
| All causes of death (E850-E869 and E880-E928) | 222 | 347 | 183 | 105 | 2174 |

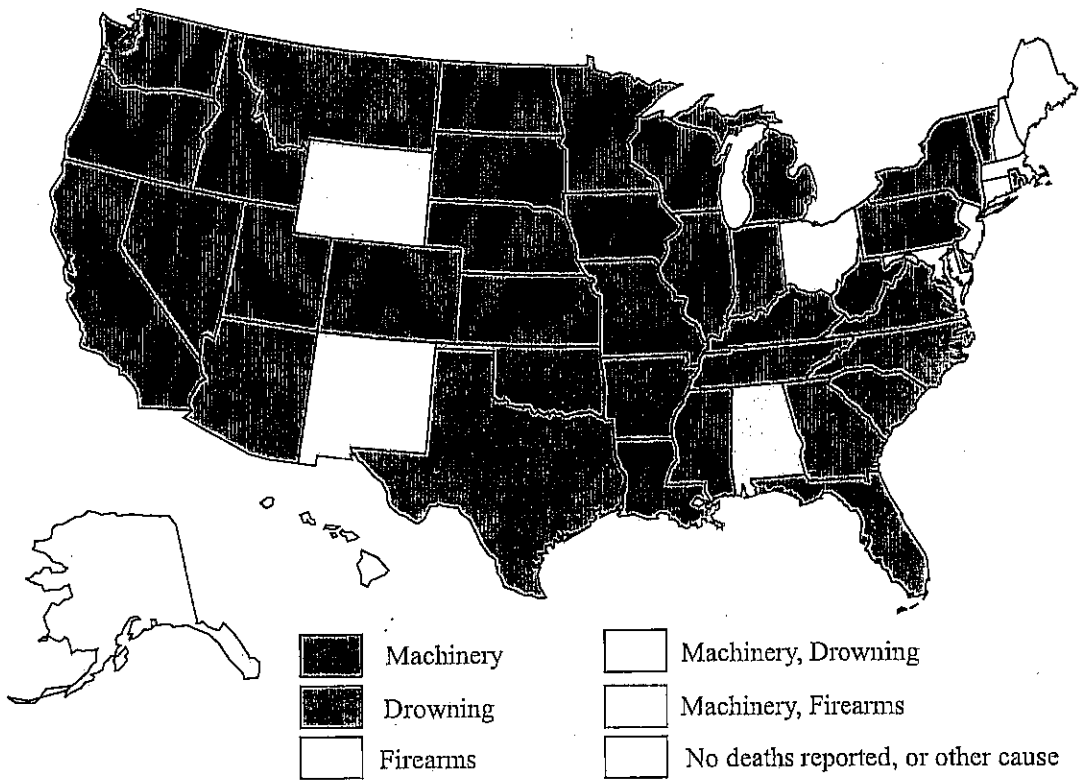


Figure 8. Leading cause of fatal farm injuries to persons less than 20 years, by state, 1982-1996

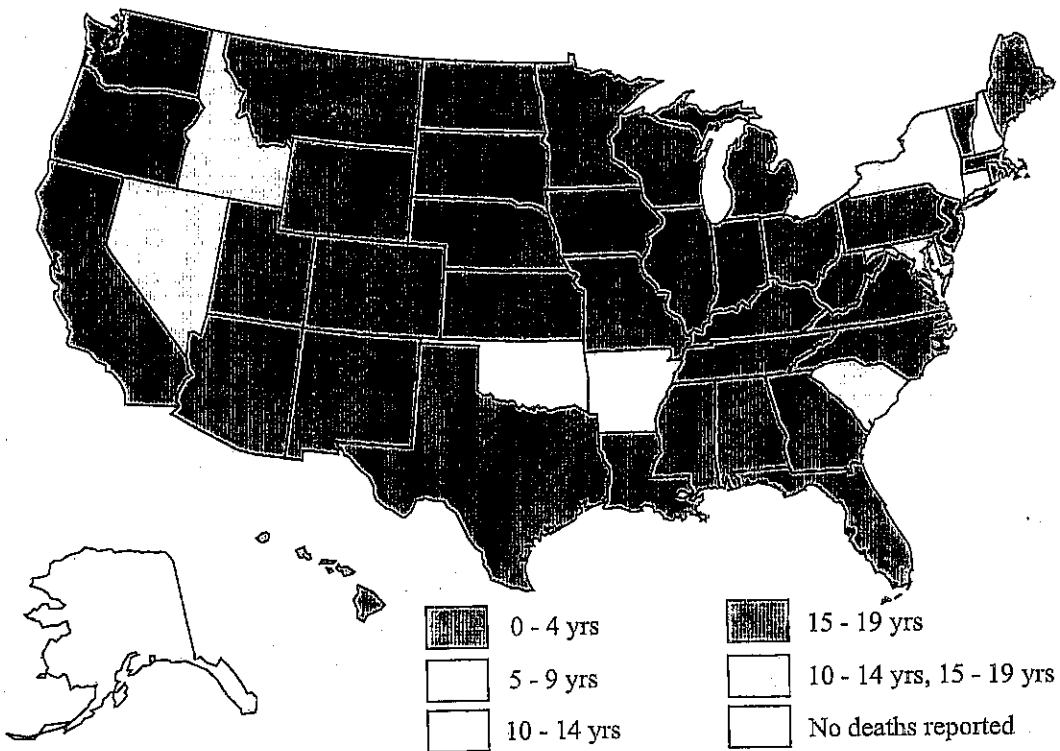


Figure 9. Age group with the highest frequency of fatal farm injuries to persons less than 20 years, by state, 1982-1996

Table 22. Fatal farm injuries to persons less than 20 years, by age group and state, 1982-1996

| State | 0 - 4 years | 5 - 9 years | 10 -14 years | 15 -19 years | Total |
|---------------|-------------|-------------|--------------|--------------|-------|
| Alabama | 8 | 1 | 3 | 13 | 25 |
| Alaska | 0 | 0 | 0 | 0 | 0 |
| Arizona | 5 | 2 | 3 | 3 | 13 |
| Arkansas | 8 | 10 | 17 | 17 | 52 |
| California | 10 | 7 | 8 | 17 | 42 |
| Colorado | 16 | 7 | 8 | 11 | 42 |
| Connecticut | 0 | 0 | 0 | 0 | 0 |
| Delaware | 1 | 0 | 0 | 0 | 1 |
| DC | 0 | 1 | 0 | 2 | 3 |
| Florida | 6 | 5 | 4 | 10 | 25 |
| Georgia | 13 | 13 | 19 | 32 | 77 |
| Hawaii | 0 | 0 | 0 | 1 | 1 |
| Idaho | 12 | 13 | 14 | 5 | 44 |
| Illinois | 17 | 17 | 14 | 27 | 75 |
| Indiana | 16 | 22 | 17 | 23 | 78 |
| Iowa | 25 | 22 | 27 | 33 | 107 |
| Kansas | 20 | 10 | 9 | 11 | 50 |
| Kentucky | 12 | 16 | 17 | 39 | 84 |
| Louisiana | 2 | 3 | 5 | 15 | 25 |
| Maine | 3 | 2 | 2 | 2 | 9 |
| Maryland | 0 | 2 | 4 | 2 | 8 |
| Massachusetts | 0 | 0 | 1 | 2 | 3 |
| Michigan | 22 | 11 | 17 | 23 | 73 |
| Minnesota | 25 | 17 | 21 | 14 | 77 |
| Mississippi | 6 | 10 | 27 | 29 | 72 |
| Missouri | 25 | 21 | 19 | 41 | 106 |
| Montana | 9 | 5 | 7 | 6 | 27 |

Table 22 (Continued). Fatal farm injuries to persons less than 20 years, by age group and state, 1982-1996

| State | 0 - 4 years | 5 - 9 years | 10 -14 years | 15 -19 years | Total |
|----------------|-------------|-------------|--------------|--------------|-------|
| Nebraska | 10 | 7 | 7 | 13 | 37 |
| Nevada | 1 | 1 | 2 | 1 | 5 |
| New Hampshire | 0 | 0 | 0 | 0 | 0 |
| New Jersey | 1 | 0 | 0 | 5 | 6 |
| New Mexico | 6 | 2 | 1 | 2 | 11 |
| New York | 7 | 10 | 13 | 9 | 39 |
| North Carolina | 14 | 15 | 26 | 36 | 91 |
| North Dakota | 8 | 3 | 3 | 5 | 19 |
| Ohio | 8 | 10 | 11 | 30 | 59 |
| Oklahoma | 18 | 19 | 13 | 16 | 66 |
| Oregon | 11 | 6 | 6 | 15 | 38 |
| Pennsylvania | 43 | 16 | 24 | 26 | 109 |
| Rhode Island | 0 | 0 | 0 | 1 | 1 |
| South Carolina | 2 | 5 | 17 | 13 | 37 |
| South Dakota | 13 | 13 | 8 | 24 | 58 |
| Tennessee | 3 | 13 | 10 | 15 | 41 |
| Texas | 47 | 36 | 42 | 79 | 204 |
| Utah | 11 | 2 | 3 | 6 | 22 |
| Vermont | 4 | 2 | 1 | 5 | 12 |
| Virginia | 4 | 9 | 10 | 11 | 34 |
| Washington | 6 | 4 | 5 | 9 | 24 |
| West Virginia | 3 | 4 | 3 | 8 | 18 |
| Wisconsin | 39 | 25 | 15 | 26 | 105 |
| Wyoming | 7 | 2 | 1 | 9 | 19 |

**Table 23. Fatal farm injuries to persons less than 20 years of age,
by cause and state, 1982-1996**

| State | Machinery | Drowning | Firearms | All other | Total |
|---------------|-----------|----------|----------|-----------|-------|
| Alabama | 6 | 5 | 7 | 7 | 25 |
| Alaska | 0 | 0 | 0 | 0 | 0 |
| Arizona | 1 | 6 | 1 | 5 | 13 |
| Arkansas | 13 | 20 | 4 | 15 | 52 |
| California | 16 | 6 | 2 | 18 | 42 |
| Colorado | 11 | 8 | 3 | 20 | 42 |
| Connecticut | 0 | 0 | 0 | 0 | 0 |
| Delaware | 0 | 1 | 0 | 0 | 1 |
| DC | 0 | 0 | 0 | 3 | 3 |
| Florida | 12 | 2 | 2 | 9 | 25 |
| Georgia | 19 | 31 | 10 | 17 | 77 |
| Hawaii | 0 | 0 | 0 | 1 | 1 |
| Idaho | 22 | 11 | 4 | 7 | 44 |
| Illinois | 27 | 16 | 2 | 30 | 75 |
| Indiana | 34 | 17 | 11 | 16 | 78 |
| Iowa | 50 | 15 | 14 | 28 | 107 |
| Kansas | 20 | 15 | 5 | 10 | 50 |
| Kentucky | 34 | 22 | 11 | 17 | 84 |
| Louisiana | 13 | 7 | 1 | 4 | 25 |
| Maine | 3 | 3 | 0 | 3 | 9 |
| Maryland | 2 | 2 | 0 | 4 | 8 |
| Massachusetts | 0 | 0 | 0 | 3 | 3 |
| Michigan | 34 | 7 | 9 | 23 | 73 |
| Minnesota | 37 | 6 | 9 | 25 | 77 |
| Mississippi | 6 | 49 | 9 | 8 | 72 |
| Missouri | 29 | 39 | 14 | 24 | 106 |
| Montana | 5 | 7 | 3 | 12 | 27 |

Table 23 (Continued). Fatal farm injuries to persons less than 20 years of age, by cause and state, 1982-1996

| State | Machinery | Drowning | Firearms | All other | Total |
|----------------|-----------|----------|----------|-----------|-------|
| Nebraska | 15 | 2 | 3 | 17 | 37 |
| Nevada | 0 | 3 | 1 | 1 | 5 |
| New Hampshire | 0 | 0 | 0 | 0 | 0 |
| New Jersey | 0 | 0 | 0 | 6 | 6 |
| New Mexico | 3 | 2 | 3 | 3 | 11 |
| New York | 20 | 5 | 2 | 12 | 39 |
| North Carolina | 24 | 36 | 8 | 23 | 91 |
| North Dakota | 6 | 5 | 2 | 6 | 19 |
| Ohio | 17 | 17 | 8 | 17 | 59 |
| Oklahoma | 15 | 32 | 4 | 15 | 66 |
| Oregon | 15 | 10 | 4 | 9 | 38 |
| Pennsylvania | 47 | 20 | 5 | 37 | 109 |
| Rhode Island | 0 | 1 | 0 | 0 | 1 |
| South Carolina | 5 | 26 | 4 | 2 | 37 |
| South Dakota | 25 | 10 | 6 | 17 | 58 |
| Tennessee | 12 | 17 | 6 | 6 | 41 |
| Texas | 44 | 73 | 38 | 49 | 204 |
| Utah | 7 | 4 | 0 | 11 | 22 |
| Vermont | 6 | 1 | 0 | 5 | 12 |
| Virginia | 15 | 10 | 5 | 4 | 34 |
| Washington | 15 | 4 | 0 | 5 | 24 |
| West Virginia | 11 | 4 | 3 | 0 | 18 |
| Wisconsin | 71 | 5 | 8 | 21 | 105 |
| Wyoming | 6 | 3 | 6 | 4 | 19 |

Table 24. Leading causes of fatal farm injuries to persons less than 20 years, Alabama, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Firearms (E922) | 7 | 28 |
| Machinery (E919) | 6 | 24 |
| Drowning (E910) | 5 | 20 |
| Electric current (E925) | 3 | 12 |
| All other causes (E888, E906, E909) | 4 | 16 |
| All causes of death (E850-E869 and E880-E928) | 25 | 100 |

Table 25. Leading causes of fatal farm injuries to persons less than 20 years, Arizona, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Drowning (E910) | 6 | 46 |
| Injury caused by animals (E905-E906) | 2 | 15 |
| Electric current (E925) | 2 | 15 |
| All other causes (E919, E922, E928) | 3 | 23 |
| All causes of death (E850-E869 and E880-E928) | 13 | 100 |

Table 26. Leading causes of fatal farm injuries to persons less than 20 years, Arkansas, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Drowning (E910) | 20 | 38 |
| Machinery (E919) | 13 | 25 |
| Firearms (E922) | 4 | 7 |
| Injury caused by animals (E905-E906) | 3 | 6 |
| Mechanical suffocation (E911-E913) | 3 | 6 |
| Struck by or against/caught in or between objects (E916-E918) | 3 | 6 |
| Electric current (E925) | 3 | 6 |
| All other causes (E866, E891, E907, E928) | 3 | 6 |
| All causes of death (E850-E869 and E880-E928) | 52 | 100 |

Table 27. Leading causes of fatal farm injuries to persons less than 20 years, California, 1982-1996

| Cause of Death | Frequency | Percent |
|---|------------------|----------------|
| Machinery (E919) | 16 | 38 |
| Drowning (E910) | 6 | 14 |
| Mechanical suffocation (E911-E913) | 4 | 10 |
| Struck by or against/caught in or between objects (E916-E918) | 4 | 10 |
| Electric current (E925) | 4 | 10 |
| All other causes (E854, E868, E888, E891, E906, E922, E928) | 8 | 18 |
| All causes of death (E850-E869 and E880-E928) | 42 | 100 |

Table 28. Leading causes of fatal farm injuries to persons less than 20 years, Colorado, 1982-1996

| Cause of Death | Frequency | Percent |
|---|------------------|----------------|
| Machinery (E919) | 11 | 26 |
| Drowning (E910) | 8 | 19 |
| Falls (E880-E888) | 5 | 12 |
| Struck by or against/caught in or between objects (E916-E918) | 4 | 9 |
| Injury caused by animals (E905-E906) | 4 | 9 |
| Firearms (E922) | 3 | 7 |
| All other causes (E892, E901, E907, E913, E925) | 7 | 18 |
| All causes of death (E850-E869 and E880-E928) | 42 | 100 |

Table 29. Leading causes of fatal farm injuries to persons less than 20 years, Florida, 1982-1996

| Cause of Death | Frequency | Percent |
|---|------------------|----------------|
| Machinery (E919) | 12 | 48 |
| Injury caused by animals (E905-E906) | 4 | 16 |
| Drowning (E910) | 2 | 8 |
| Firearms (E922) | 2 | 8 |
| All other causes (E888, E891, E913, E918, E925) | 5 | 20 |
| All causes of death (E850-E869 and E880-E928) | 25 | 100 |

Table 30. Leading causes of fatal farm injuries to persons less than 20 years, Georgia, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Drowning (E910) | 31 | 40 |
| Machinery (E919) | 19 | 25 |
| Firearms (E922) | 10 | 13 |
| Mechanical suffocation (E911-E913) | 4 | 5 |
| Falls (E880-E888) | 3 | 4 |
| Struck by or against/caught in or between objects (E916-E918) | 3 | 4 |
| All other causes (E868, E891, E896, E906, E925) | 7 | 9 |
| All causes of death (E850-E869 and E880-E928) | 77 | 100 |

Table 31. Leading causes of fatal farm injuries to persons less than 20 years, Idaho, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Machinery (E919) | 22 | 50 |
| Drowning (E910) | 11 | 25 |
| Firearms (E922) | 4 | 9 |
| All other causes (E892, E906, E913, E916, E918, E925) | 7 | 16 |
| All causes of death (E850-E869 and E880-E928) | 44 | 100 |

Table 32. Leading causes of fatal farm injuries to persons less than 20 years, Illinois, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Machinery (E919) | 27 | 36 |
| Drowning (E910) | 16 | 21 |
| Mechanical suffocation (E911-E913) | 9 | 12 |
| Struck by or against/caught in or between objects (E916-E918) | 5 | 7 |
| Accidental poisoning (E850-E869) | 4 | 5 |
| Falls (E880-E888) | 4 | 5 |
| Electric current (E925) | 4 | 5 |
| All other causes (E906, E921, E922, E928) | 6 | 9 |
| All causes of death (E850-E869 and E880-E928) | 75 | 100 |

Table 33. Leading causes of fatal farm injuries to persons less than 20 years, Indiana, 1982-1996

| Cause of Death | Frequency | Percent |
|---|------------------|----------------|
| Machinery (E919) | 34 | 44 |
| Drowning (E910) | 17 | 22 |
| Firearms (E922) | 11 | 14 |
| Struck by or against/caught in or between objects (E916-E918) | 6 | 8 |
| Mechanical suffocation (E911-E913) | 5 | 6 |
| All other causes (E868, E906, E925) | 5 | 6 |
| All causes of death (E850-E869 and E880-E928) | 78 | 100 |

Table 34. Leading causes of fatal farm injuries to persons less than 20 years, Iowa, 1982-1996

| Cause of Death | Frequency | Percent |
|---|------------------|----------------|
| Machinery (E919) | 50 | 47 |
| Drowning (E910) | 15 | 14 |
| Mechanical suffocation (E911-E913) | 14 | 13 |
| Firearms (E922) | 14 | 13 |
| Struck by or against/caught in or between objects (E916-E918) | 4 | 4 |
| All other causes (E884, E894, E901, E906, E908, E924, E925, E928) | 10 | 9 |
| All causes of death (E850-E869 and E880-E928) | 107 | 100 |

Table 35. Leading causes of fatal farm injuries to persons less than 20 years, Kansas, 1982-1996

| Cause of Death | Frequency | Percent |
|---|------------------|----------------|
| Machinery (E919) | 20 | 40 |
| Drowning (E910) | 15 | 30 |
| Firearms (E922) | 5 | 10 |
| Struck by or against/caught in or between objects (E916-E918) | 3 | 6 |
| Electric current (E925) | 3 | 6 |
| All other causes (E884, E888, E912, E920, E928) | 4 | 8 |
| All causes of death (E850-E869 and E880-E928) | 50 | 100 |

Table 36. Leading causes of fatal farm injuries to persons less than 20 years, Kentucky, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Machinery (E919) | 34 | 40 |
| Drowning (E910) | 22 | 26 |
| Firearms (E922) | 11 | 13 |
| Struck by or against/caught in or between objects (E916-E918) | 5 | 6 |
| Explosive material (E923) | 4 | 5 |
| Mechanical suffocation (E911-E913) | 3 | 4 |
| All other causes (E888, E894, E906, E920, E928) | 5 | 6 |
| All causes of death (E850-E869 and E880-E928) | 84 | 100 |

Table 37. Leading causes of fatal farm injuries to persons less than 20 years, Louisiana, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Machinery (E919) | 13 | 52 |
| Drowning (E910) | 7 | 28 |
| All other causes (E888, E906, E922, E925) | 5 | 20 |
| All causes of death (E850-E869 and E880-E928) | 25 | 100 |

Table 38. Leading causes of fatal farm injuries to persons less than 20 years, Michigan, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Machinery (E919) | 34 | 47 |
| Firearms (E922) | 9 | 12 |
| Drowning (E910) | 7 | 10 |
| Nature/environment (E900-E904, E907-E909) | 4 | 5 |
| Mechanical suffocation (E911-E913) | 4 | 5 |
| Struck by or against/caught in or between objects (E916-E918) | 4 | 5 |
| Injury caused by animals (E905-E906) | 3 | 4 |
| Electric current (E925) | 3 | 4 |
| All other causes (E862, E883, E884, E891) | 5 | 7 |
| All causes of death (E850-E869 and E880-E928) | 73 | 100 |

Table 39. Leading causes of fatal farm injuries to persons less than 20 years, Minnesota, 1982-1996

| Cause of Death | Frequency | Percent |
|---|------------------|----------------|
| Machinery (E919) | 37 | 48 |
| Firearms (E922) | 9 | 12 |
| Mechanical suffocation (E911-E913) | 7 | 9 |
| Drowning (E910) | 6 | 8 |
| Nature/environment (E900-E904, E907-E909) | 4 | 5 |
| Struck by or against/caught in or between objects (E916-E918) | 4 | 5 |
| Electric current (E925) | 4 | 5 |
| Injury caused by animals (E905-E906) | 3 | 4 |
| All other causes (E864, E920, E925, E928) | 3 | 4 |
| All causes of death (E850-E869 and E880-E928) | 77 | 100 |

Table 40. Leading causes of fatal farm injuries to persons less than 20 years, Mississippi, 1982-1996

| Cause of Death | Frequency | Percent |
|---|------------------|----------------|
| Drowning (E910) | 49 | 68 |
| Firearms (E922) | 9 | 13 |
| Machinery (E919) | 6 | 8 |
| Struck by or against/caught in or between objects (E916-E918) | 3 | 4 |
| All other causes (E868, E883, E884, E906, E913, E928) | 5 | 7 |
| All causes of death (E850-E869 and E880-E928) | 72 | 100 |

Table 41. Leading causes of fatal farm injuries to persons less than 20 years, Missouri, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Drowning (E910) | 39 | 37 |
| Machinery (E919) | 29 | 27 |
| Firearms (E922) | 14 | 13 |
| Nature/environment (E900-E904, E907-E909) | 5 | 5 |
| Injury caused by animals (E905-E906) | 5 | 5 |
| Mechanical suffocation (E911-E913) | 5 | 5 |
| Falls (E880-E888) | 4 | 4 |
| All other causes (E891, E916, E925) | 5 | 5 |
| All causes of death (E850-E869 and E880-E928) | 106 | 100 |

Table 42. Leading causes of fatal farm injuries to persons less than 20 years, Montana, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Drowning (E910) | 7 | 26 |
| Machinery (E919) | 5 | 19 |
| Struck by or against/caught in or between objects (E916-E918) | 3 | 11 |
| Firearms (E922) | 3 | 11 |
| All other causes (E888, E906, E909, E913, E925) | 9 | 33 |
| All causes of death (E850-E869 and E880-E928) | 27 | 100 |

Table 43. Leading causes of fatal farm injuries to persons less than 20 years, Nebraska, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Machinery (E919) | 15 | 41 |
| Struck by or against/caught in or between objects (E916-E918) | 7 | 19 |
| Electric current (E925) | 4 | 11 |
| Firearms (E922) | 3 | 8 |
| All other causes (E888, E906, E909, E910, E913, E928) | 8 | 21 |
| All causes of death (E850-E869 and E880-E928) | 37 | 100 |

**Table 44. Leading causes of fatal farm injuries to persons less than 20 years,
New Mexico, 1982-1996**

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Machinery (E919) | 3 | 27 |
| Firearms (E922) | 3 | 27 |
| All other causes (E888, E906, E909, E910) | 5 | 46 |
| All causes of death (E850-E869 and E880-E928) | 11 | 100 |

**Table 45. Leading causes of fatal farm injuries to persons less than 20 years,
New York, 1982-1996**

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Machinery (E919) | 20 | 51 |
| Drowning (E910) | 5 | 13 |
| Injury caused by animals (E905-E906) | 3 | 8 |
| Struck by or against/caught in or between objects (E916-E918) | 2 | 5 |
| Firearms (E922) | 2 | 5 |
| Electric current (E925) | 2 | 5 |
| All other causes (E869, E888, E891, E913) | 5 | 13 |
| All causes of death (E850-E869 and E880-E928) | 39 | 100 |

**Table 46. Leading causes of fatal farm injuries to persons less than 20 years,
North Carolina, 1982-1996**

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Drowning (E910) | 36 | 40 |
| Machinery (E919) | 24 | 26 |
| Firearms (E922) | 8 | 9 |
| Mechanical suffocation (E911-E913) | 5 | 6 |
| Struck by or against/caught in or between objects (E916-E918) | 5 | 6 |
| Electric current (E925) | 3 | 3 |
| All other causes (E863, E884, E888, E906, E907) | 10 | 10 |
| All causes of death (E850-E869 and E880-E928) | 91 | 100 |

Table 47. Leading causes of fatal farm injuries to persons less than 20 years, North Dakota, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Machinery (E919) | 6 | 31 |
| Drowning (E910) | 5 | 26 |
| Struck by or against/caught in or between objects (E916-E918) | 3 | 16 |
| All other causes (E909, E913, E922) | 5 | 26 |
| All causes of death (E850-E869 and E880-E928) | 19 | 100 |

Table 48. Leading causes of fatal farm injuries to persons less than 20 years, Ohio, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Drowning (E910) | 17 | 29 |
| Machinery (E919) | 17 | 29 |
| Firearms (E922) | 8 | 14 |
| Struck by or against/caught in or between objects (E916-E918) | 5 | 8 |
| Electric current (E925) | 3 | 5 |
| All other causes (E862, E888, E892, E906, E909, E913, E928) | 9 | 15 |
| All causes of death (E850-E869 and E880-E928) | 59 | 100 |

Table 49. Leading causes of fatal farm injuries to persons less than 20 years, Oklahoma, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Drowning (E910) | 32 | 48 |
| Machinery (E919) | 15 | 23 |
| Injury caused by animals (E905-E906) | 6 | 9 |
| Firearms (E922) | 4 | 6 |
| All other causes (E899, E913, E917, E925, E928) | 9 | 14 |
| All causes of death (E850-E869 and E880-E928) | 66 | 100 |

Table 50. Leading causes of fatal farm injuries to persons less than 20 years, Oregon, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Machinery (E919) | 15 | 39 |
| Drowning (E910) | 10 | 26 |
| Firearms (E922) | 4 | 11 |
| Struck by or against/caught in or between objects (E916-E918) | 3 | 8 |
| All other causes (E869, E888, E906, E925, E928) | 6 | 16 |
| All causes of death (E850-E869 and E880-E928) | 38 | 100 |

Table 51. Leading causes of fatal farm injuries to persons less than 20 years, Pennsylvania, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Machinery (E919) | 47 | 43 |
| Drowning (E910) | 20 | 18 |
| Falls (E880-E888) | 13 | 12 |
| Mechanical suffocation (E911-E913) | 8 | 7 |
| Struck by or against/caught in or between objects (E916-E918) | 5 | 5 |
| Firearms (E922) | 5 | 5 |
| Accidental poisoning (E850-E869) | 3 | 3 |
| Injury caused by animals (E905-E906) | 3 | 3 |
| All other causes (E923, E925, E928) | 5 | 5 |
| All causes of death (E850-E869 and E880-E928) | 109 | 100 |

Table 52. Leading causes of fatal farm injuries to persons less than 20 years, South Carolina, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Drowning (E910) | 26 | 70 |
| Machinery (E919) | 5 | 14 |
| Firearms (E922) | 4 | 11 |
| All other causes (E909, E928) | 2 | 5 |
| All causes of death (E850-E869 and E880-E928) | 37 | 100 |

Table 53. Leading causes of fatal farm injuries to persons less than 20 years, South Dakota, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Machinery (E919) | 25 | 43 |
| Drowning (E910) | 10 | 17 |
| Firearms (E922) | 6 | 10 |
| Nature/environment (E900-E904, E907-E909) | 3 | 5 |
| Mechanical suffocation (E911-E913) | 3 | 5 |
| Struck by or against/caught in or between objects (E916-E918) | 3 | 5 |
| All other causes (E860, E869, E906, E920, E925, E928) | 8 | 14 |
| All causes of death (E850-E869 and E880-E928) | 58 | 100 |

Table 54. Leading causes of fatal farm injuries to persons less than 20 years, Tennessee, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Drowning (E910) | 17 | 41 |
| Machinery (E919) | 12 | 29 |
| Firearms (E922) | 6 | 15 |
| All other causes (E884, E887, E891, E913, E916, E917, E928) | 6 | 15 |
| All causes of death (E850-E869 and E880-E928) | 41 | 100 |

Table 55. Leading causes of fatal farm injuries to persons less than 20 years, Texas, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Drowning (E910) | 73 | 36 |
| Machinery (E919) | 44 | 22 |
| Firearms (E922) | 38 | 19 |
| Electric current (E925) | 12 | 6 |
| Injury caused by animals (E905-E906) | 9 | 4 |
| Nature/environment (E900-E904, E907-E909) | 7 | 3 |
| Mechanical suffocation (E911-E913) | 6 | 3 |
| Struck by or against/caught in or between objects (E916-E918) | 4 | 2 |
| Fire & flames (E890-E899) | 3 | 1 |
| All other causes (E862, E882, E888, E921, E923, E928) | 8 | 4 |
| All causes of death (E850-E869 and E880-E928) | 204 | 100 |

Table 56. Leading causes of fatal farm injuries to persons less than 20 years, Utah, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Machinery (E919) | 7 | 32 |
| Drowning (E910) | 4 | 18 |
| All other causes (E888, E906, E909, E913, E918, E925) | 11 | 50 |
| All causes of death (E850-E869 and E880-E928) | 22 | 100 |

Table 57. Leading causes of fatal farm injuries to persons less than 20 years, Vermont, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Machinery (E919) | 6 | 50 |
| Drowning (E910) | 1 | 8 |
| All other causes (E909, E913, E925, E928) | 5 | 42 |
| All causes of death (E850-E869 and E880-E928) | 12 | 100 |

Table 58. Leading causes of fatal farm injuries to persons less than 20 years, Virginia, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Machinery (E919) | 15 | 44 |
| Drowning (E910) | 10 | 29 |
| Firearms (E922) | 5 | 15 |
| Struck by or against/caught in or between objects (E916-E918) | 3 | 9 |
| Mechanical suffocation (E911-E913) | 1 | 3 |
| All causes of death (E850-E869 and E880-E928) | 34 | 100 |

Table 59. Leading causes of fatal farm injuries to persons less than 20 years, Washington, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Machinery (E919) | 15 | 63 |
| Drowning (E910) | 4 | 17 |
| Injury by animals (E905-E906) | 3 | 12 |
| Falls (E880-E888) | 2 | 8 |
| All causes of death (E850-E869 and E880-E928) | 24 | 100 |

Table 60. Leading causes of fatal farm injuries to persons less than 20 years, West Virginia, 1982-1996

| Cause of Death | Frequency | Percent |
|---|-----------|---------|
| Machinery (E919) | 11 | 61 |
| Drowning (E910) | 4 | 22 |
| Firearms (E922) | 3 | 17 |
| All causes of death (E850-E869 and E880-E928) | 18 | 100 |

Table 61. Leading causes of fatal farm injuries to persons less than 20 years,
Wisconsin, 1982-1996

| Cause of Death | Frequency | Percent |
|---|------------------|----------------|
| Machinery (E919) | 71 | 67 |
| Firearms (E922) | 8 | 7 |
| Mechanical suffocation (E911-E913) | 6 | 6 |
| Drowning (E910) | 5 | 5 |
| Struck by or against/caught in or between objects (E916-E918) | 5 | 5 |
| Falls (E880-E888) | 4 | 4 |
| All other causes (E906, E920, E923, E925) | 6 | 6 |
| All causes of death (E850-E869 and E880-E928) | 105 | 100 |

Table 62. Leading causes of fatal farm injuries to persons less than 20 years,
Wyoming, 1982-1996

| Cause of Death | Frequency | Percent |
|---|------------------|----------------|
| Machinery (E919) | 6 | 31 |
| Firearms (E922) | 6 | 31 |
| Drowning (E910) | 3 | 16 |
| All other causes (E906, E918, E925) | 4 | 21 |
| All causes of death (E850-E869 and E880-E928) | 19 | 100 |

Appendix

Classification of External Causes of Unintentional Deaths*

| Cause of Death | E-code |
|--|------------------|
| Poisoning | 850-869 |
| Falls | 880-888 |
| Fire & flames | 890-899 |
| Nature/environment | 900-904, 907-909 |
| Injury caused by animals | 905-906 |
| Drowning | 910 |
| Mechanical suffocation | 911-913 |
| Struck by or against/caught in or between objects | 916-918 |
| Machinery | 919 |
| Cutting and piercing instruments or objects | 920 |
| Explosion of pressure vessel | 921 |
| Firearms | 922 |
| Explosive material | 923 |
| Hot substance or object, caustic or corrosive material and steam | 924 |
| Electric current | 925 |
| Other unspecified causes, e.g., noise, vibration, etc. | 928 |

*International Classification of Diseases, 9th Revision.





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