HHS Public Access

Author manuscript

J Rural Health. Author manuscript; available in PMC 2020 March 13.

Published in final edited form as:

J Rural Health. 2018 June ; 34(3): 246–253. doi:10.1111/jrh.12245.

Trends and Characteristics of Occupational Suicide and Homicide in Farmers and Agriculture Workers, 1992–2010

Wendy Ringgenberg, PhD, MPH, MS[1], **Corinne Peek-Asa, Phd, MPH**[1], **Kelley Donham, DVM, MS**[1], **Marizen Ramirez, PhD, MPH**[1]

[1]Department of Occupational and Environmental Health, College of Public Health, University of Iowa, Iowa City, Iowa.

Abstract

Objective—We examined work-related homicides and suicides among farm operators/workers in the United States from 1992 to 2010.

Methods—Work-related homicide and suicide cases from 1992 to 2010 were obtained from the Census of Fatal Occupational Injuries. To calculate rates, denominator data on the US working population were also obtained from 2003 to 2010 Current Population Survey. Logistic regression was used to identify factors that were differentially associated with homicide and suicide.

Results—Over these 19 years, 171 farm operators/workers died from homicide and 230 died from suicide. When compared to rates of all workers, suicide rates were higher while homicide rates were lower among farm operators/workers. Males (OR = 6.1), whites (OR = 4.7), and 35- to 54-year-old (OR = 2.3) farm operators/workers had increased odds of suicide over homicide compared with their respective counterparts (ie, females, nonwhites, <35-year-olds). Those working in smaller farm operations with <11 employees had 1.7 times the odds of suicide over homicide.

Conclusions—Suicide and homicide are both present in the agricultural industry, with suicide being more common than homicide. Translation of suicide prevention programs should be explored for the agricultural industry.

An estimated 1.2 million farm operators and 758,000 farm laborers work in the United States.1, 2 Farmers represent iconic American values, including hard work, strong morality, family centered, and purposeful living. However, violent death by suicide or homicide occurs in this population, and it severely impacts the family, the farm business, and the surrounding community.3

Suicide is the 10th leading cause of all deaths in the United States, while homicide ranks 15th. Work-related suicide and homicide are forms of workplace violence, which is defined by the National Institute of Occupational Safety and Health as “violent acts (including physical assaults and threats of assaults) directed toward persons at work or on duty.” Workplace violence is the second leading cause of occupational fatality.4, 5 Farm operators and farmworkers are significantly understudied in the area of violent workplace fatalities, but studies consistently show that farmers are at increased risk for violent death, and in particular for suicide. In 2013, the Bureau of Labor Statistics (BLS) reported over a 3-fold risk of suicide for the agricultural, forestry, and fishing industries (AFF), the category that

includes farmers and agriculture workers, compared with the general working population.6 Conversely, AFF homicide rates were lower than all other industries. In 2013, homicides comprised only 2% of all workplace deaths in AFF, compared with 9% for all workers.5, 7 Studies have shown that suicide accounts for 8%-14% of farm deaths, and homicide for as much as 6%.8, 9

There is a small but growing body of epidemiologic research on risk factors for suicide in agriculture. Suicide rates are high among farmers who are owner-operators, especially after economic crises, and also among rural males. Social isolation, physical injury, and chronic pain are factors common for farmers and those at risk for suicide.10-21 Exposure to pesticides has been shown to be associated with depression and hypothesized as a causal link.13 Access to lethal means may also contribute to farmer suicide, and firearms have been identified as the most frequent method.11, 21-23

Relative to suicide, far fewer studies have been published on risk factors for homicide among farm operators/workers. However, available data reveal homicide rates in the South have to be higher than other regions in the United States. One suggested reason is a greater cultural acceptance of violence in rural regions of the country, where agricultural occupations are the most prevalent.19 Furthermore, interpersonal violence has been found to be higher in rural than nonmetropolitan, urban populations.7 Research in interpersonal violence suggests that isolation in rural communities is a critical factor, as is financial strain that can affect farming families.19

We reviewed 19 years (1992-2010) of work-related homicides and suicides from the BLS's Census of Fatal Occupational Injuries (CFOI) among farmer operators (farmers, farm owners, farm managers) and farmworkers (agriculture workers and laborers) in the United States. We compared rates of homicides and suicides to the general working population and examined patterns by demographics, regions, and type of injury.

Methods

Data Sources

Suicide and homicide cases from 1992 to 2010 were obtained from the BLS' CFOI.24 The BLS verifies each occupational fatality using at least 2 data sources (worker's compensation reports, death certificates, accident reports, or media) and ensures that the fatality occurred either (1) on the employer's premises and the person was there to work, or (2) off the employer's premises and the person was there to work.25

Denominator values for the total working population as well as for farmers and farmworkers were obtained from the Current Population Survey (CPS; US Census Bureau), available in annual numbers only from 2003 through 2010.26 Denominator data for farmer operators and agricultural workers for 1992-2002 were estimated by assigning the average of the first 5 years of available data (2003-2008) from the CPS, a number ranging from 2,275,000 to 2,095,000. The resulting estimates were consistent with the reported annual number and trends of farm operators only from the Department of Agriculture, which ranged from 1,925,300 in 1992 to 1,911,859 in 1997.27

Variables

The year of death, age categories, gender, race/ethnicity (categorized as white or nonwhite), and geographic location of the death based on the state and the Bureau of the Census regions (Northeast, Midwest, South, West) were collected for each homicide and suicide.28

The occupational code used by CFOI was the US Census Bureau Occupation Classification System (1992-2002) and the 2000 Standard Occupation Classification (SOC) System (2003-2010).24 The 2000 SOC removed farm operators from the general agriculture category and placed them in the manager category.29 To analyze all 19 years of data consistently, codes from the 2 classification schemes were compared and combined to identify farmers and farm managers, farmworkers, and direct supervisors. Farmers/farm managers included codes 473, 474, 475, and 476 from the US Census codes and 11–9010, 11–9011, 11–9012, 45–1010, 45–1011, and 45–1012 from SOC. Agricultural workers/ supervisors included codes 477, 479, 483, 484, 485, 488, and 489 from the US Census codes and 45–2000 through 45–2099 from SOC.

The Occupational Injury and Illness Classification System was used to code additional worker characteristics, including employee status (self-employed, working on a family farm, or working for pay), worker location at the time of the incident (eg, farm, farm house, farm building), and farm size (employee numbers of 1–10; 11–19; 20–99; and more than 100).30

Analysis

Suicide and homicide rates were calculated for farm operators/workers and all workers by dividing the number of fatalities by the number of estimated workers from the CPS. Frequencies of homicides and suicides were compared by age, race, employee status, worker location, region, and employee size using the chi-square tests. Any cell size below 5 was combined with another category to help ensure privacy of information.

Logistic regression was used on the victim population to identify factors differentially associated with suicide and homicide farm deaths. Due to small cell sizes, we created broad categories for race (white = 1, not white = 0), age (34 years and younger, 35-54 years, 55-64 years, and 65 years and older), employee status (self-employed = 1, not self-employed = 0), and establishment size (1-10 employees, 10 employees or more). Odds ratios and 95% confidence intervals were reported.

Results

A total of 6,664 farm operators and 3,372 farmworkers died while working from 1992 through 2010. During this 19-year period, 171 farm operators/workers died from homicide and 230 died from suicide. Suicide rates for farm operators/workers ranged from 0.36/100,000 to 0.95/100,000 over the study period; these rates are higher than suicide rates for all occupations (0.13/100,000-0.19/100,000) during the same time period (Figure 1). In contrast, homicide rates for farm operators/workers, which ranged from 0.23/100,000 to 0.89/100,000, were generally lower than for all occupations (0.38/100,000-0.89/100,000) (Figure 2). The South (44.4%) and West (39.8%) had the greatest proportion of farm operator/worker homicide compared with other regions of the United States. The West

(43.0%) and Midwest (37.4%), in comparison, had the highest proportion of farm operator/worker suicide (Figure 3). These regional differences were statistically significant (Pearson's chi-square = 61.724, *P* value <.001).

Northeast: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. Midwest: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. South: Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. West: Arizona, Colorado, Idaho, Montana, Nevada, Alaska, California, Among victims, males had 6.1 times the odds for suicide over homicide (95% CI = 1.86–20.11). Compared with nonwhites, whites had 4.7 times the odds of suicide over homicide (95% CI = 1.79–12.12). Self-employed farm operators/workers had 2.3 times the odds of suicide over homicide compared to those who worked for pay (CI = 1.35–3.80). And, those working in a smaller establishment size with fewer than 11 employees had 1.9 times the odds of suicide over homicide (95% CI = 1.21–3.01). Farm operators/workers between 35 and 54 years of age had 1.7 times increased odds of suicide when compared to those less than 35 years of age (CI = 0.93–2.99).

Discussion

Suicide rates for farmers were higher than for all occupations in each of the 19 study years, which is consistent with other published studies that examined shorter time periods and limited geographic regions.1, 10, 11, 21 Farmers and agriculture workers have occupational exposures to several of the risk factors associated with suicide: financial stress, access to lethal means, chronic conditions, isolation, and poor access to mental and health care services.15-17, 20, 22, 23, 31 Self-employed farmers were more than 2 times likely to be a victim of suicide than homicide compared to those who worked for pay, which may suggest increased vulnerability due to financial responsibility for the farming operation. These findings suggest that suicide was triggered by some type of owner-operator stress. Many farmers, especially those who self-identify occupationally as farmer, may very well not work in any other off-farm position, indicating that the income from farming is likely the farmer's only income.31 Operators, many of whom are self-employed and have few employees, take on significant responsibilities for day-to-day operations of the farm, with high work load and financial responsibilities. This increased hands-on role in both work task and management creates greater personal investment in the farm and its operations.32 Additional information from peers and coworkers would provide greater insights regarding prefatality circumstances. Currently, the CFOI database does not include information regarding prior state of mind or interviews with friends and family.

Access to firearms is common on farms, although we do not know the role of firearms in suicides in this study. However, other published studies indicate that firearms are involved in about 50% of suicides in the general population, and an alarming 86% of the time in farmers.4, 11, 21

Farmers may also have specific exposures that may increase their suicide risk, such as exposure to insecticides, which have been linked to depression.13 In addition, farmers are susceptible to other general risk factors for suicide which can include being male, a history of mental illness, chronic pain or illness, alcohol or drug abuse, and feeling loss of control over life.31 The occupational factors such as poor access to quality health care, isolation, and financial stress may interact with life factors to place farmers at a disproportionately high risk for suicide. For example, the lack of access to or seeking of health care services is common in rural, agricultural communities, which can result in substance abuse, interpersonal violence, anger, and hopelessness—all of which have been associated with suicide.32

In contrast to suicide rates, homicide rates among farmers were generally lower than rates for the total working population. Although the overall workforce experienced a decrease in occupational homicide over the study period, this decrease was not present among farm homicides. Our findings on farmer homicide are not consistent with previous research. Two proportional mortality studies of agriculture workers, one in the United States and one in British Columbia, found an elevated risk for homicide among agriculture workers.9, 33 These inconsistencies may be related to heterogeneity in the risk population. For example, more than 61% of homicide victims worked for pay, suggesting that farmworkers, but perhaps not farm owners, are at increased risk. Farmworkers may have more interaction with others and less control over their work environment than owners, who may be more likely to work in isolation.

Regional differences in the distribution of homicides and suicides among farmers were noteworthy. The Western CFOI region had a high proportion of both farmer homicides (39.8%) and farmer suicides (43%). Rates were not calculated because denominator data by region was not available, but the National Agriculture Statistics Service reported farm numbers which show that the Midwest region contained 50% of the nation’s farms; the South had 30%; the West contained 16%; and the Northeast had 4%.34 The Northeast region, which is likely to have the lowest number of farmers, had a low proportion of both homicide (4.7%) and suicide (6.1%). However, contrasts were found in the Midwest region, which had a far higher proportion of suicides (37.4%) than homicides (11.1%), and the South, which had a far higher proportion of homicides (44.4%) than suicides (13.5%). Areas for further inquiry include cultural differences in tolerance for violence, regional differences in availability of mental health services for farmers, and varying stressors impacting farmers in different parts of the country.

A number of unique relationships emerged when comparing homicide and suicide victims by worker characteristics. More than 61% of homicide victims worked for pay, whereas 65% of the suicide victims were self-employed. This finding may be attributed to the fact that farm operators work in isolation with fewer interactions with others, whereas farmworkers interact with others. The increased interaction with other workers or rural community members may explain why farmworkers are disproportionately represented in homicides compared with suicides. Strategies for prevention must consider the unique interpersonal interactions, including race, ethnicity, and economics experienced by farmworkers.

Finally, agricultural work tasks are physically and psychologically taxing, and prior research suggests that the physical agricultural environment creates stress on farmers that can result in depression. Farming, especially for those who are owner-operators, can be socially isolating due to the singular nature of activities and the rural location. Both stress and isolation are risk factors for suicide.31

Limitations

The CFOI is the most accurate surveillance system of occupationally related death available in the United States, but difficulties in identifying occupational deaths, especially for violent causes, is a challenge. Two sources of misclassification may lead to underreporting of suicides and homicides, particularly among farmers. First, ascertaining the work-relatedness of a violent death can be difficult. The BLS recognizes a work relationship when (1) the fatality occurred on the employer's premises and the person was there to work, or (2) the fatality occurred off the employer's premises and the person was there to work, or (3) the event or exposure was related to the person's work or status as an employee.25 Because farmers often conduct business from their homes and with family members, this leads to potential misclassification of work-relatedness. Second, only 45% of farmers identify as farmers on occupational census data, often because they have nonfarm sources of income, which will lead to an undercount of farmer deaths.35 The database did not provide secondary occupations. Future research efforts that can identify secondary occupations as farmers or farmworkers might better inform the risk of suicide or homicide related to agriculture occupations.

Our rate calculations were limited by lack of annual data on the farming population for both farm owners and farmworkers. We overcame this limitation by estimating the population at risk using available information. Future research will want to better define comparison populations, and compare farmer and agriculture worker data with rural populations and compare rates with trends in agriculture, weather, and economic events.

Homicide and suicide are relatively rare events, so even with 19 years of data we had small cell sizes when examining subcategories. Thus, we were limited in our ability to examine characteristics, especially among females and among homicide victims.

Public Health Implications

Homicide and suicide are concerns for the well-being of agrarian populations, for public health professionals, and for professionals in agricultural health and safety. These violent deaths devastate families emotionally and financially when they occur, and they are preventable. Although farmer and agricultural suicide has been of interest since the economic crises in the 1980s, homicide among this population is far less studied, leaving gaps in our understanding of the scope and risk factors. Our study addresses this knowledge gap by identifying patterns specific to homicide and suicide, which can aid in targeting prevention strategies. As we build this body of knowledge, we can build support for a number of important entities to develop intervention approaches specific to farmers and agriculture workers. Such agencies include the National Rural Mental Health Association,

the 10 NIOSH-funded Agricultural Research Centers, and university-based Cooperative Extension Programs.

References

1. Bureau of Labor Statistics, US Department of Labor. Occupational Outlook Handbook, 2011-12 Edition Agricultural Workers and Farmers, Ranchers, and Other Agricultural Managers. Available at: http://www.bls.gov/ooh. Published Spring 2010 Accessed June 7, 2013.
2. United States Department of Agriculture. Agricultural Census. Available at: http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/Fact_Sheets/Demographics/demographics.pdf. Published 2007 Accessed June 7, 2013.
3. Kennedy A, Maple MJ, McKay K, Brumby SA. Suicide and accidental death in Australia's rural farming communities: a review of the literature. Rural Remote Health. 2014; 13: 2517.
4. Kochanek KD, Jiaquan X, Murphy SL, Minino AM, Kung H. Deaths: Final Data for 2009. National Vital Statistics Reports. 12 29, 2011; 60: 3 Available at: http://www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_03.pdf. Accessed December 18, 2012.
5. Bureau of Labor Statistics, US Department of Labor. Census of Fatal Occupational Injuries. 2012-2013. Fatal Occupational Injuries by Event or Exposure, 2012-2013. Available at: http://www.bls.gov/news.release/cfoi.t01.htm. Published 2013 Accessed February 7, 2015.
6. Pegula SM. Analysis of Workplace Suicides 1992-2001. Available at: http://www.bls.gov/opub/mlr/cwc/an-analysis-of-workplace-suicides-1992-2001.pdf. Published January 28, 2004 Accessed December 2, 2013.
7. Peek-Asa C, Wallis A, Harland K, Beyer KM, Dickey P, Saftlas A. Rural disparity in domestic violence prevalence and access to resources. J Women's Health. 2011; 20(11): 1743–1749. PMID: 21919777.
8. Bureau of Labor Statistics, US Department of Labor. Occupational Suicides Fact Sheet. Available at: http://www.bls.gov/iif/oshwc/cfoi/osar0010.pdf. Published August 2009 Accessed July 10, 2013.
9. Mills PK, Beaumont JJ, Nasseri K. Proportionate mortality among current and former members of the United Farm Workers of America, AFL-CIO, in California 1973-2000. J Agromedicine. 2006; 11(1): 39–48. [PubMed: 16893836]
10. Alston M Rural male suicide in Australia. Soc Sci Med. 2012; 74(4): 515–522. [PubMed: 20541304]
11. Browning SR, Westneat SC, McKnight RH. Suicides among farmers in three Southeastern states, 1990-1998. J Agric Saf Health. 2008; 14(4): 461–472. [PubMed: 19044172]
12. Carson DK, Araquistain M, Ide B, Quoss B, Weigel R. Stress, strain and heartiness as predictors of adaptation in farm and ranch families. J Child Family Studies. 1994; 3(2): 157–174.
13. Beseler C, Stallones L, Hoppin J, et al. Depression and pesticide exposures in female spouses of licensed pesticide applicators in the Agricultural Health Study cohort. J Occup Environ Med. 2006; 48(10): 1005–1013. [PubMed: 17033500]
14. Gunderson P, Donner D, Nashold R, Salkowicz L, Sperry S, Wittman B. The epidemiology of suicide among farm residents or workers in five north-central states, 1980-1988. Am J Prevent Med. 1993; 9: 26–32.
15. Hanigan IC, Butler CD, Kokic PN, Hutchinson MF. Suicide and drought in New South Wales, Australia, 1970–2007. Proceedings of the National Academy of Sciences of the United States of America. Available at: http://www.pnas.org/content/109/35/13950. Published July 11, 2012 Accessed October 10, 2012.
16. Hovey JD, Magana CG. Suicide risk factors among Mexican migrant farmworker women in the Midwest United States. Arch Suicide Res. 2003; 7: 107–121.
17. London Mirror. Desperate Farmers Driven to Suicide in Mad Cow Crisis. Available at: http://www.thefreelibrary.com/DESPERATE+FARMERS+DRIVEN+TO+SUICIDE+IN+MAD+COW+CRISIS%3B+Two+die+every...-a060661730. Published March 29, 1998 Accessed March 9, 2013.

18. NHS Cumbria. A Suicide Prevention Strategy for Cumbria, 2010-2012. Available at: http://www.cumbria.nhs.uk/YourHealth/PublicHealthInformation/MentalHealthandWellbeingAssessment/SuicidePreventionStrategyCumbria2010-2012.pdf. Accessed March 8, 2013.
19. Nisbett RE. Violence and U.S. regional culture. Am Psych. 1993; 48(4): 441–449.
20. Rosmann MR, Delworth U. Clinical and community perspectives on the farm crisis. Clinical Psych. 1990; 43(1): 10–16.
21. Stallones L Suicide mortality among Kentucky farmers, 1979-1985. Suicide Life Threat Behav. 1990; 20(2): 156–163. [PubMed: 2385858]
22. Booth N, Briscore M, Powell R. Suicide in the farming community: methods used and contact with health services. Occup Environ Med. 2000; 57(9): 642–644. [PubMed: 10935946]
23. Skegg K, Firth H, Gray A, Cox B. Suicide by occupation: does access to means increase the risk? Aust N Z J Psychiat. 2010; 44(5): 429–434.
24. Bureau of Labor Statistics, US Department of Labor. BLS Handbook of Methods, Chapter 9 Occupational Safety and Health Statistics. Available at: http://www.bls.Gov/opub/hom/homch9.htm. Published September 5, 2012 Accessed on June 6, 2013.
25. Bureau of Labor Statistics, US Department of Labor. Census of Fatal Occupational Injuries: Definitions. Available at: http://www.bls.gov/iif/oshcfdef.htm. Accessed October 9, 2012.
26. Bureau of Labor Statistics, US Department of Labor. Current Population Survey Database. Available at: http://www.bls.gov/cps/#data. Accessed on July 13, 2012.
27. United States Department of Agriculture. 1997 Census Publication Available at: http://www.agcensus.usda.gov/Publications/1997/Census_Highlights/U_S_Summary/us.txt. Accessed July 13, 2012.
28. United States Bureau of Census. Regions and Divisions. Available at: http://www.census.gov/econ/census/help/geography/regions_and_divisions.html. Accessed September 1, 2015.
29. United States Bureau of Census. Technical Paper #65. Available at: http://www.census.gov/people/io/files/techpaper2000.pdf. Published Oct 2003 Accessed July 31, 2013.
30. Bureau of Labor Statistics, US Department of Labor. Occupational Injury and Illness Manual; 2007. Available at: http://www.bls.gov/iif/oshoiics.htm. Accessed May 28, 2013.
31. US Department of Health and Human Services, Public Health Service. National Strategy for Suicide Prevention: Goals and Objectives for Action (DHHS Publication No. SMA 01-3517). Rockville, MD: 2001 Available at: http://www.sprc.org/sites/sprc.org/files/library/nssp.pdf. Accessed October 16, 2012.
32. Bultena G, Lasley P, Guler J. The farm crisis: patterns and impacts of financial distress among Iowa farm families. Rural Sociol. 1986; 51: 436–448.
33. Gallagher RP, Threlfall WJ, Spinelli JJ, Band PR. Occupational mortality patterns among British Columbia farm workers. J Occup Med. 1984; 26(12): 906–908. [PubMed: 6512613]
34. National Agriculture Statistics Service (NASS). Farms and Land in Farms; 2014 Available at: http://usda.mannlib.cornell.edu/usda/nass/FarmLandIn//2010s/2015/FarmLandIn-02-19-2015.pdf. Accessed April 30, 2016.
35. Environmental Protection Agency (EPA). Ag 101. Available at: http://www.epa.gov/agriculture/ag101/demographics.html. Updated April 14, 2013 Accessed June 7, 2013.

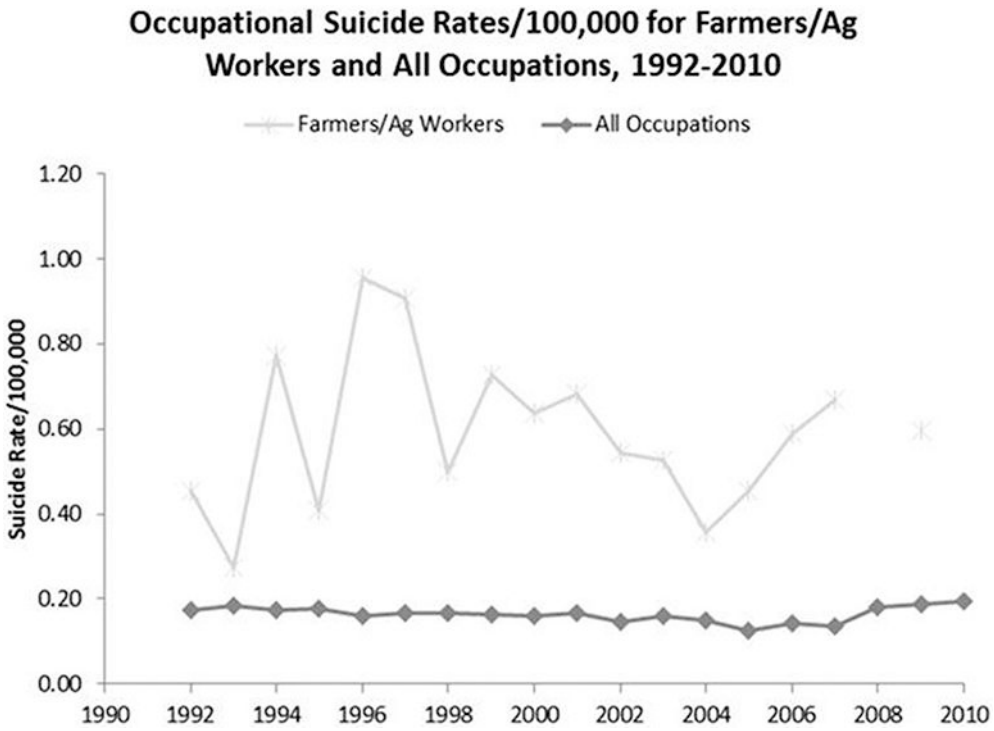

Figure 1.

Occupational Suicide Rates per 100,000 Farmers and Agriculture Workers Compared to Occupational Suicide Rates per 100,000 Workers in All Occupations From 1992 Through 2010.

Note: 2008 and 2010 data are either not available or do not meet BLS publication criteria. Fatal injury data and rates were generated/calculated by the author with restricted access to BLS CFOI microdata.

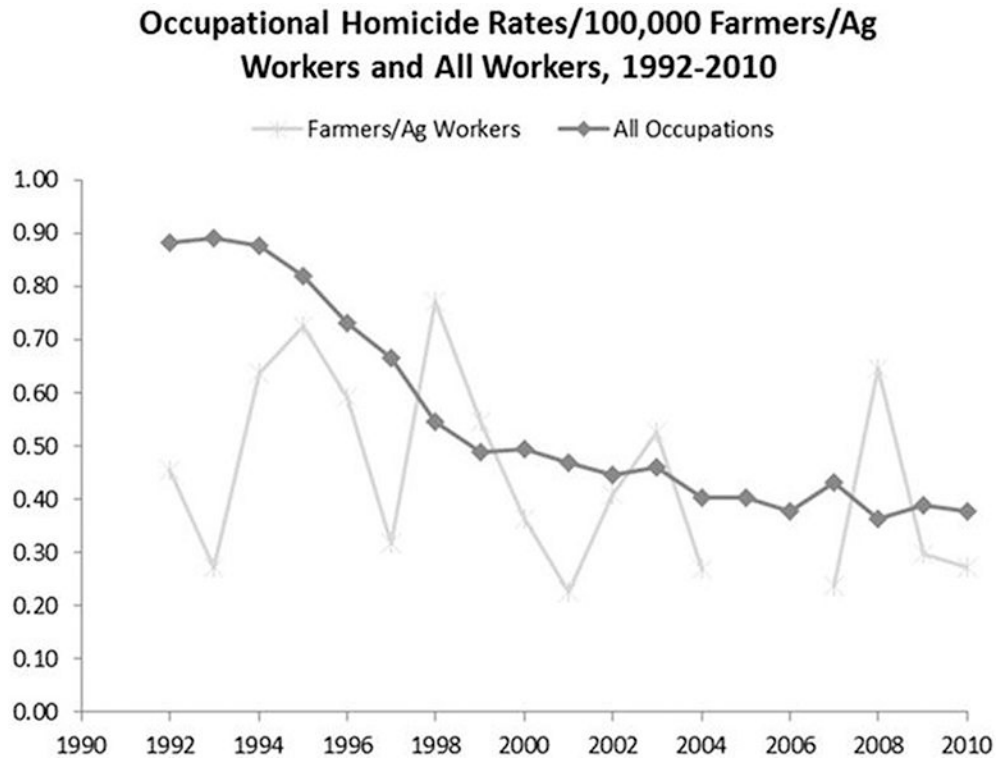

Figure 2.

Occupational Homicide Rates per 100,000 Farmers and Agriculture Workers Compared to Occupational Homicide Rates per 100,000 Workers in All Occupations From 1992 Through 2010.

Note: 2005 and 2006 data are either not available or do not meet BLS publication criteria. Fatal injury data and rates were generated/calculated by the author with restricted access to BLS CFOI microdata.

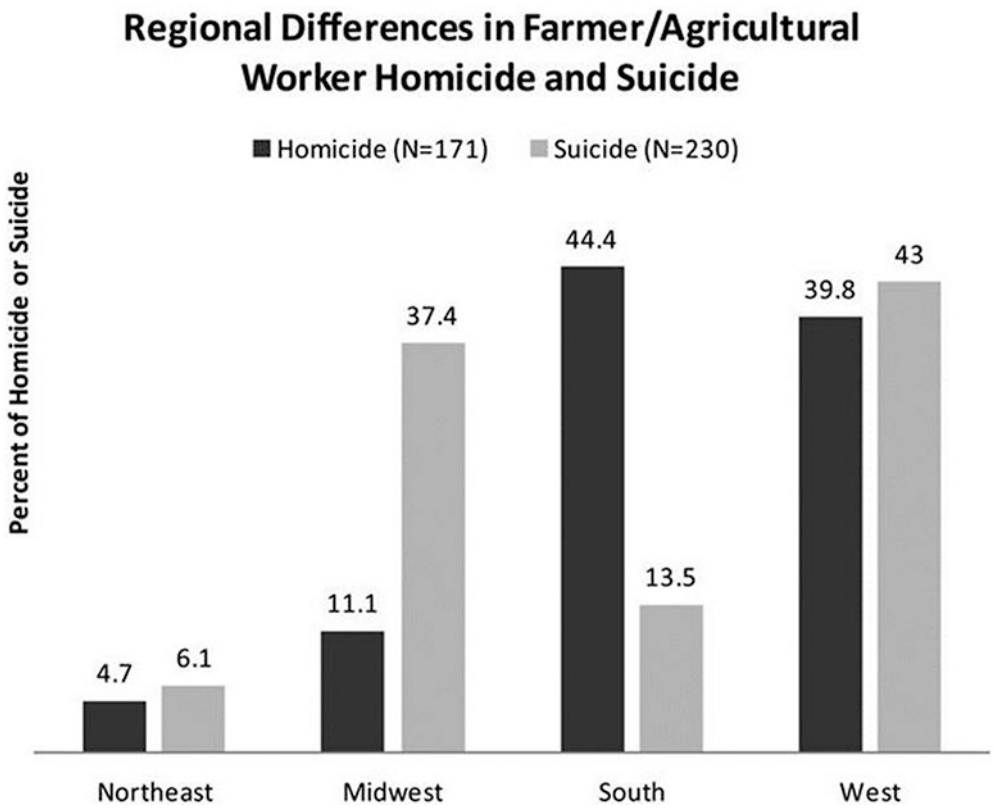

Figure 3.

Regional Differences in Farmer and Agriculture Worker Homicide and Suicide Percentages. Note: Fatal injury data and rates were generated/calculated by the author with restricted access to BLS CFOI microdata.

Hawaii, Oregon, Washington, New Mexico, Utah, and Wyoming.28

During the study period, 381 male and 20 female farmers or agriculture workers were victims of homicide or suicide, or 95% male to 5% female victims (Table 1). The only relevant gender comparison found was in the US Census of Agriculture (2007) that identified 86% male farm operators versus 14% female farm operators.2 Males represented more than 90% of both suicides and homicides. Homicide victims were predominately white (83%), over 25 years of age (87%), and working for pay (56.7%). Over a third of homicide victims worked in businesses with fewer than 10 employees. In comparison, suicide victims were primarily white (97.4%), over 35 years of age (82%), self-employed (65.2%), and working primarily in businesses with fewer than 10 employees (64.3%). Of the 171 homicides over the 19-year period, shooting was the most prevalent method for both males and females (n = 135), followed by hitting, kicking, and beating (n = 16), and stabbing (n = 13). No data on means for suicide were available.

Table 1.

Demographics and Worker Characteristics of Farmers and Ag Workers Who Were Victims of Homicide and Suicide, 1992-2010 [a,b].

		Homicide	Suicide	*P* Value
Total		171 (100%)	230 (100%)	
Gender	Males	155	226	<.01
	Females (n = 20)[b]	n/a	n/a	
Age	19 y or under	7 (4.1%)	6 (2.6%)	<.01
	20-24 y	13 (7.6%)	8 (3.5%)	
	25-34 y	38 (22.2%)	28 (12.2%)	
	35-44 y	37 (21.6%)	50 (21.7%)	
	45-54 y	19 (11.1%)	58 (25.2%)	
	55-64 y	25 (14.6%)	33 (14.3%)	
	65+ y	29 (17%)	47 (20.4%)	
Race	White	142 (83%)	224 (97.4%)	<.01
	Other (Black/African American, American Indian/Alaskan Native/Native, Hawaiian/Pacific Islander, Multiple Races)	26 (15.2%)	5 (2.2%)	
Employee Status	Self-Employed	66 (38.6%)	150 (65.2%)	<.01
	Work in Family Business	7 (4.1%)	22 (9.6%)	
	Work for Pay	97 (56.7%)	57 (24.8%)	
Worker Location	Farm	18 (10.5%)	12 (5.2%)	<.01
	Farm house	13 (7.6%)	25 (10.9%)	
	Farm, unspecified	24 (14.0%)	56 (24.3%)	
	Farm building, not silo	16 (9.4%)	76 (33.0%)	
	Farm land or			
	Commercial store	54 (31.6%)	30 (13.0%)	
Employer Size	1-10 employees	65 (38%)	148 (64.3%)	<.01
	11-19 employees	10 (2.5%)	9 (2.2%)	
	20-99 employees	13 (3.2%)	5 (1.2%)	
	100 or more	10 (2.5%)	5 (1.2%)	
	Missing	73 (18.2%)	63 (15.7%)	

[a] Fatal injury data and rates were generated/calculated by the author with restricted access to BLS CFOI microdata.

[b] Small cell sizes precluded further stratification.