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Characteristics and Contextual Stressors in Farmer and Agricultural Worker Suicides in Georgia From 2008–2015

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Farmers and agricultural workers are at elevated risk of suicide. The majority of farmer suicide research has been completed in Australia; less is known about farmer suicide in the United States and in specific regions of the country. This study addressed this knowledge gap by examining suicide data for farmers and agricultural workers from the Georgia Violent Death Reporting System, 2008–2015. We found that farmers who died by suicide were predominantly male, White, non-Hispanic, and older, with slightly fewer than half being married, and half having a high school education or less. The most common means of death was gunshot wound (78%), followed by hanging (16%). The contextual factors most frequently reported to be associated with suicide were relationship conflict or loss (25%) and health problems (25%), including chronic pain and decreased function. Financial problems (12%) and substance use (11%) also were associated with suicides. In 21% of cases, the individual was reported to have made prior suicidal threats; however, family members were reported to often discount these indicators. These findings suggest that suicide prevention programs might include suicide education for community members in rural areas. Rural health care providers could bebmblic bm-19.7(bmblicgl)-33blicg(educationblicg)-247.nblicgdlssssss,Tlprob7.nblefer.4(car-W9

2016). Farmer suicide has been studied extensively in Australia, with rates significantly above that seen for the overall employed popula-

substance involvement, and means of suicide. In addition, careful analysis was made of law enforcement reports and coroner or medical examiner report summaries, to provide greater insight into possible factors and contexts that may have led to suicide. This information may be useful in better understanding the risk factors and antecedents to suicide in farmers and agricultural workers in the United States, and thus in designing interventions to provide supports and services to prevent farmer suicides.

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Data for this study were obtained from the

school degree or GED, and slightly under 19% had some college education or beyond.

Mean of Suicide

The means of suicide for the overwhelming majority of farmers was by a firearm. Over three quarters of the deaths were the result of gunshot wound—nearly 58% by gunshot wound to the head, over 13% by gunshot wound to the chest, and 6.6% by gunshot to other parts of the body. The next most common means of suicide was by hanging (16.04%). A few other means were also observed, including two individuals who died by poisoning, and one each by jumping from a window, stabbing, throwing himself in front of a car, and disconnecting himself from life-supporting medical devices in order to go into medical crisis and die.

Substance Use at Time of Event

In the vast majority of cases (75.47%) there was no information about the use of alcohol or drugs by the individual at or immediately preceding the time of suicide. For those 26 cases where data were collected, in 12 cases (46.15%) there was evidence of substance use. In all cases, the substance was alcohol.

Factors Associated With Suicide

Qualitative analyses of coroner/medical examiner and law enforcement reports revealed a number of major themes related to factors associated with the suicide events. It is important to note that in 21 (19.81%) cases, no coroner/medical examiner or law enforcement summaries were entered, indicating that in these cases the reports had not been received by the GA VDRS (National Violent Death Reporting System, 2014). In an additional 17 (16.04%) cases, the summaries contained descriptions of the fatal injury but no further details about contextual factors. To clarify this, Table 1 shows the actual number of cases containing each theme, the percentage of all cases (106) containing each theme, and the percentage of cases without missing summaries (68) containing each theme.

Painful Relationship

Painful relationship issues were a common theme, noted in over 27 cases (25.47%). In 10 of these cases (37.04%), these were conflicts with a primary relationship such as a wife or girlfriend, including situations such as this:

> Victim and his [primary relationship] were fighting about Victim's heavy drinking, [with the primary relationship] wanting Victim to get help for his drinking . . . [primary relationship] stated that they cooked dinner and they were still fighting about his drinking and the Victim stated he would just kill himself . . . she then heard the gun go off.

An extreme example of this was seen in one case where the individual shot his primary relationship (with whom there was a long history of intimate partner violence) and then died by suicide.

In 7 (25.92%) of the cases with relationship issues, the conflict was with other family members, exemplified by the case of an unemployed farm worker where "The decedent's [parent] got onto him about 'needing to get a job and starting to act more like a responsible adult.' Before the event took place he had also stolen $20 from [a family member] a few days prior."

Another common relationship issue was that of loss, seen in 7 (25.92%) of the cases. As with conflict, the most common subject of loss was a primary relationship, such as a wife or girlfriend. This occurred in 5 cases (18.51%). In two situations, the loss was because of the partner's illness, as when "The Victim was upset because his [primary relationship] was placed in an out-of-state assisted living home," or when "Victim's [primary relationship] had a stroke

Table 1
Contributing/Related Factors from Coroner/Medical Examiner and Law Enforcement Reports

Factor	*n*	% of total *N*	% of *N* with data
Relationship Issues	27	25.47%	39.71%
Health Issues	26	24.53%	38.23%
Suicidal Threats	22	20.75%	32.35%
Missing	21	19.81%	30.88%
Factors Unknown	17	16.04%	25.00%
Mental Health Issues	15	14.15%	22.06%
Financial Problems	13	12.26%	19.11%
Signs and Behavioral Indication	8	7.55%	11.76%
Recently Depressed	7	6.60%	10.29%
Criminal Justice Involvement	5	4.72%	7.35%

Note. Total *N* for study = 106. *N* with data from coroner/medical examiner or law enforcement reports = 68.

recently and had been staying with their child in another state. He had a hard time adjusting with his [primary relationship] not being there with him and had been upset and depressed." In three others, the primary relationship had chosen to leave. In one such case,

> The Victim's [primary relationship] of 23 years re-

tempts by the Victim." Sometimes these prior

suicides—giving a glimpse into the stories behind the numbers.

For this research, we used data from the GA VDRS. As with any secondary data analysis, our analyses were limited by the variables provided. Beyond this, the GA VDRS has specific limitations, which must be recognized. In some cases, GA VDRS was not able to obtain coroner/medical examiner and/or law enforcement reports, and data are missing. If coroners/medical examiners and law enforcement did not ask certain questions, gather certain data, or note the information in their reports, it was not in the data set and thus not available to us. In addition, coroner/medical examiners and law enforcement officers vary in what they ask, observe, and record, affecting the reliability of the data.

Given these limitations, we are cautious in our interpretation of the data. We cannot make claims about what the individuals or their family and friends did or said; we can only report what was recorded, acknowledging that the absence of an event (e.g., family taking an individual for mental health treatment) does not necessarily mean that it did not occur, but simply that it was not noted. Similarly, we cannot claim that a factor or issue was not present in a case (e.g., substance use) simply because it was not present in the data; we can only state that it was not present in the GA VDRS data set.

A second limitation of the data is the inability to differentiate farmer from agricultural worker. Given the multiple ways in which employment is noted in the VDRS (formal employment code, descriptor, report summaries), using multiple and sometimes unclear terms, it is impossible to clearly sort individuals into farmer or worker. However, because these groups have different roles and experiences, being unable to distinguish them is a significant limitation. Finally, because the data were from one state and not nationally representative, generalizability of findings also is limited.

Despite these limitations, given that better data are not currently available, the study is a useful next step in exploring the question of farmer suicide and supports and expands upon the existing literature, nationally and internationally. The farmers in this study were primarily older, White, and male, which is similar to what is seen both in farmers in general (Jenner, 2014) and in individuals who have died by suicide (National Institute of Mental Health, 2018). In our study, over 40% percent of the individuals were married, 18% were divorced, and over 30% were never married. This is also similar to the general demographics of individuals who have died by suicide, where 33% were married, 33% never married, and 22% divorced (National Violent Death Reporting System, 2017). This proportion of never married individuals is somewhat different than that reported in some studies on farmer suicides, where

farmer suicides is needed to better understand farmer vulnerability to relationship conflict.

A primary factor associated with suicide in this study was an individual's struggle with poor health, seen in nearly 25% of cases. In some situations, the lack of ability to work, to be independent, and not to be a burden to family seems to have been overwhelming. In other cases, the farmers seem to have been worn down by chronic pain and health issues, and simply could not continue to function with that level of discomfort. These findings support some earlier studies identifying physical illness and pain as common factors in farmer suicides (Kunde et al., 2017; Sturgeon & Morrissette, 2010). They also parallel findings from the CDC (2018b), where physical health problems were identified as factors contributing to suicide in 22% of the general population.

The inability to work precipitated by either acute or chronic health conditions and resultant suicidal action may be understood in part by considering rural attitudes toward independence and the ability to engage in hard work. In one study, nearly 42% of farmers surveyed defined health as the ability to work. (Reed, Rayens, Conley, Westneat, & Adkins, 2012). Laoire (2005) identified a clear link between masculine identity and ability to work on the farm. Loss of health resulting in inability to work, therefore, could lead to both loss of income and loss of identity for farmers.

Much has been written about the financial crisis experienced by many farmers in the U.S. (Sullivan, 2018), and we anticipated that financial stressors would be a common antecedent to suicide in our study. In their study, Sturgeon and Morrissette (2010) found financial concerns present in 55% of farmers with suicidal ideation. Perceval et al. (2018) identified the economic impact of weather, price fluctuations, and crop yields as stressors linked with increased risk of suicide. We found financial stressors were reported far less frequently than anticipated, and we found no specific mention of risk of losing the farm because of financial problems, or concerns about weather, price fluctuations, or poor crops. In a number of cases, the report simply stated that the individual was having "financial problems," so specific financial issues could not be identified. In a few cases, unpaid medical bills merged the stressors of poor health and poor finances.

Substance abuse is frequently seen in connection with suicide. The CDC (2018b) reported that problematic substance use was present in 28% of people who died by suicide. Our study could not identify substance abuse, but could identify the presence of substances at time of death. We found that in 20% of cases, substance use was reported as a factor present at the time of suicide. However, because of the limitations of the data, we cannot with certainty say that farmer suicides are associated with lower rates of substance use than seen in the general public; this is an avenue for further exploration.

A number of individuals in this study (14.15%) were reported to have experienced mental health issues. This relatively small percentage is much lower than that seen in the general population, where 46% of people who died by suicide had a known mental health condition (CDC, 2018b). In only a few cases did we find that the individual was reported to have received mental health treatment. These small numbers could be the result of data limitations and missing information, or could indicate an actual lower rate of mental health issues in this study population. Findings in the literature are mixed on rates of depression in farmers and rural communities (Arnautovska et al., 2016; Fraser et al., 2005; Judd et al., 2006).

In this study, we found that over 20% of the individuals were reported to have made suicidal threats prior to their death. In situations where the individual's suicidal threats were known to family and friends, it was seldom reported that family or friends took action and helped the individual obtain treatment. In fact, documentation stated that in several cases, family and friends with knowledge of an individual's prior

is no record of such actions. However, these

seen to be associated with suicide, medical settings could be opportune sites for preventive interventions. Some studies have indicated that although farmers may be reluctant to seek men-

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