

**Behavioral Health among Rural First Responders:
A White Paper Commissioned by the Michigan Rural EMS Network**

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Introduction

Aims

First responders represent an incredibly resilient population as they weather various occupational stressors in the line of duty. By virtue of their occupational demands, first responders are at significant risk for developing behavioral health problems due to consistent exposure to occupational stressors (e.g., shift work) and potentially traumatic events (PTEs; e.g., natural disasters, emergency medical events, crime scenes) (Kleim & Westphal, 2011; Jones, 2017). Although the behavioral health of first responders has gained increasing attention in recent years, research on the specific population of rural first responders is an understudied area (Jones et al., 2018). This paper seeks to provide an overview of the available literature on the behavioral health of rural first responders, including research on prevalent mental health conditions (e.g., posttraumatic stress disorder [PTSD], depression, alcohol and substance use, suicide risk) and related conditions (e.g., sleep problems). An additional aim of this review is to provide insight into how best to address the behavioral health needs of rural first responders and provide future research directions.

Rural First Responders

First responders work across various settings, including urban and rural areas, and in career/full-time, paid part-time, and/or volunteer positions (Roberts et al., 2021). The work of first responders might differ significantly based on occupational role (e.g., fire, EMS, law enforcement) and geographic location. For example, firefighters in the western US may work more in wildland fire zones, while firefighters in the southern US may contend with floods and hurricanes to a greater extent. In rural communities, first responders include firefighters, emergency medical technicians (EMTs), paramedics, and law enforcement officers (LEOs)

(Greene et al., 2019; Regambal et al., 2015). The US Census Bureau defines the term “rural” as any population, housing, or territory that is not in an urban area (Ratcliffe et al., 2016). While it is difficult to precisely define the occupational setting of rural first responders, it generally includes work in smaller communities and sparsely populated areas connected by large areas of land (e.g., farmlands, wilderness) (Greene et al., 2019).

Rural first responders experience unique challenges that distinguish them from their urban counterparts (Regambal et al., 2015; Wagner & O’Neill, 2012). These challenges are primarily related to the geography of where they work, as well as available resources (e.g., funding, equipment, training, infrastructure) and staffing (Greene et al., 2019; Regambal et al., 2015). Since rural emergency services generally serve geographically large and sporadically populated regions, the response times for services may be increased due to longer distances, mixed terrain, highway/road infrastructure, and adverse weather conditions (Leung & Shen, 2022). Furthermore, because of limited personnel, rural first responders are more likely to experience isolation on the job (i.e., working alone in remote locations), have less access to professional backup in emergencies, and respond to situations that require them to juggle various responsibilities (e.g., emergency medical assistance, hazardous material decontamination, technical rescue) that might be handled by individuals in more specialized roles in urban settings (Henderson & Sowa, 2018; Regambal et al., 2015). Additionally, rural first responders are more likely to respond to situations that have some form of direct connection to their private lives, such as personally knowing individuals involved in the emergency (Wagner & O’Neill, 2012). Each of these unique occupational challenges faced by rural first responders presents an important consideration with regard to behavioral health outcomes.

Behavioral Health: First Responders

Nationally representative or epidemiological data documenting prevalence rates among representative samples of first responders are lacking. Most of the available research on the behavioral health of first responders has not examined factors related to the geography and/or population density in which these populations work. The current section will review the existing literature on the behavioral health of first responders, generally, including research on firefighters, paramedics, EMTs, and LEOs. The most common behavioral health topics researched within these populations include trauma exposure and PTSD, depression and anxiety disorders, alcohol and substance use, suicide, and sleep disturbances.

Potentially traumatic events (PTEs) and PTSD. When considering that the primary role of first responders is being the first to arrive and provide aid at the scene of emergency situations, the magnitude of PTEs experienced by this population and their risk for developing PTSD from potentially chronic exposure to PTEs is clear. Most firefighters, paramedics, EMTs, and LEOs have experienced a PTE, although few comprehensive studies exist to provide conclusive estimates of numbers and types of PTEs experienced on the job (versus PTEs predating the job or PTEs experienced in personal lives), as well as prevalence rates of PTSD across these various first responder populations (Carleton et al., 2019).

Per the *Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5)*, a potentially traumatic event (PTE) can be defined as “exposure to actual or threatened death, serious injury, or sexual violence,” through either direct experience, witnessing the event, learning the event has happened to a close family member or friend, or having repeated or extreme exposure to distressing details of a traumatic event (American Psychiatric Association, 2013). PTSD is marked by symptoms of trauma-related intrusions, avoidance of internal and external trauma-related cues, trauma-related negative alterations in cognition and mood, and

trauma-related alterations in arousal and reactivity (American Psychiatric Association, 2013). PTSD prevalence rates are estimated to range from 17% to 32% among firefighters, 6% to 32% among LEOs, and 9% to 22% for EMTs (Boffa et al., 2017; Jones, 2017; Lewis-Schroeder et al., 2018). In comparison, approximately 8.3% of adults in the general US population will develop PTSD during their lifetime (Kilpatrick et al., 2013). PTSD prevalence estimates among first responders vary significantly, and it is additionally important to note that subthreshold PTSD symptoms have been found to result in similar functional impairment as symptoms meeting full diagnostic criteria for PTSD (Pietrzak et al., 2011).

First responder populations experience unique types and severity levels of PTEs. Even though not all first responders who experience a PTE develop PTSD, the cumulative nature of these events, the severity of the traumas, as well as many other factors contribute to the likelihood of the development of PTSD within this population (Haugen et al., 2012; Kleim & Westphal, 2011; Klimley et al., 2018). Most research on first responders does not make a distinction between diagnoses that occur before or after a PTE, and the majority of available research is cross-sectional and does not examine the time in which the PTE occurred relative to the onset of PTSD or other psychiatric conditions (White et al., 2023). Overall, longitudinal research that starts with early training in this population and spans the career-spectrum into retirement is lacking; these types of studies would strengthen our understanding of the relationships that exist between PTEs and PTSD symptoms across the lifespan of first responders. Most first responders with PTSD have another co-occurring disorder, with some of the most common being depression, anxiety, and alcohol use disorders (Bowler et al., 2016; Jones, 2017).

Other behavioral health symptoms. The experience of PTEs and occupational stress, generally, has been associated with the development of psychiatric disorders other than and/or in addition to PTSD (Jones, 2017). Depression and anxiety disorder prevalence rates among first responders are less studied than PTSD and are estimated to range from 7–22% and 4–22%, respectively (Kleim & Westphal, 2011; Jones, 2017). General prevalence rates of co-occurring major depressive disorder (MDD) with PTSD and generalized anxiety disorder (GAD) with PTSD are estimated at 84.4% and 42.5%, respectively; these comorbidities are often predicted by number and severity of PTEs experienced (Spinhoven et al., 2014). While the comorbidities of PTSD with depression and anxiety disorders are partially explained by the overlap of symptoms, these disorders share numerous common risk factors that can be classified as either non-occupationally related (e.g., shared genetic and sociodemographic predictors) and occupationally related (e.g., PTE exposures, impact of shift work, workplace social support) (Kleim & Westphal, 2011; Jones, 2017; Marmar et al., 2006).

Co-occurring PTSD and alcohol use disorder (AUD) is highly prevalent among both general community populations and military veterans (Back & Jones, 2018; Blanco et al., 2013), and there is a growing literature on this comorbidity among first responders (Bonumwezi et al., 2022; Lebeaut et al., 2021; Tomaka et al., 2017). Research has suggested that first responders may use alcohol to cope with PTSD-related symptoms (Simons et al., 2005; Tomaka et al., 2017). Available literature among first responders shows that PTSD and AUD symptoms are both common, although epidemiological studies documenting specific prevalence rates within this population are lacking (Tomaka et al., 2017; Lebeaut et al., 2021). Lifetime prevalence rates of AUD among firefighters are estimated to be as high as 50% (Carey et al., 2011; Haddock et

al., 2012), compared to rates of less than 30% among the general U.S. population (Grant et al., 2015).

Even fewer studies have examined other substance use among first responders, possibly due to mandatory regular or random drug testing in most departments that precludes substance use or biases the reporting of such use in research studies (Beauchamp et al., 2022; Bonumwezi et al., 2022). Furthermore, data on hazardous alcohol use among first responders may be more abundant than other substance use because of the greater acceptance of alcohol use in first responder culture compared to other substances, as well as probable underreporting of other substance use due to concerns about work-related consequences of disclosing this behavior. One recent study found that nearly 40% of treatment-seeking first responders screened positive for a possible substance use disorder (Beauchamp et al., 2022). The limited extant research on alcohol and other substance use among first responders does point to a relationship between these issues and the experience of PTEs and PTSD symptomatology (Bonumwezi et al., 2022; Lebeaut et al., 2021).

There are multiple other behavioral health issues of note within first responder populations, including a growing body of research on the increased risk for suicide among this population (Heyman et al., 2018; Lyra et al., 2021; Stanley et al., 2016). Findings from a systematic review show that LEOs, firefighters, and EMTs are at an elevated risk for suicidal thoughts and behaviors compared to the general population (Stanley et al., 2016). In a sample of firefighters, 46.8% had thought about suicide, 19.2% made a suicide plan, and 15.5% have made a suicide attempt (Stanley et al. 2015). These rates are substantially higher than the estimated rates among the general U.S. population, wherein 5.6-14.3% have thought about suicide, 3.9% have made a suicide plan, and 1.9-8.7% have made a suicide attempt (Nock et al., 2008). The

exact mechanisms driving the increased rates of suicidal ideation and capability among first responders are largely unknown, however it is likely due to a combination of greater risk of other behavioral health comorbidities associated with suicide symptomology (e.g., PTSD, depression) and occupational-related factors (e.g., access to highly lethal suicide means) (Bond & Anestis, 2021; Stanley et al., 2016).

Sleep disturbance is another pertinent behavioral health issue common among first responders. The shift work and irregular work schedules experienced by first responders puts them at a much higher risk for developing sleep disorders compared to the general population (Huang et al., 2022; Jones, 2017; Marmar et al., 2006). A recent meta-analysis examining the prevalence of sleep disorders among first responders found the prevalence of shift work disorder (i.e., a circadian rhythm sleep disorder affecting individuals who work nontraditional hours) at 31%, obstructive sleep apnea at 30%, and both insomnia and excessive daytime sleepiness at 28% (Huang et al., 2022). Increased stress and emotion regulation difficulties have been associated with shift work, potentially hindering the ability of first responders to process their experiences of PTEs, putting them at further risk for the development of psychiatric disorders and relationship problems (Feldman et al., 2021; Huang et al., 2022).

Behavioral Health: Rural Populations

In addition to occupational stressors and behavioral health outcomes related to their work, first responders who reside within the same or neighboring rural communities that they serve may face additional challenges related to the realities of rural living and culture. For example, individuals living in rural areas are at a higher risk for numerous behavioral health issues compared to those living in urban areas, including PTSD, substance use, and suicidal ideation (Dworkin et al., 2017; Hirsch & Cukrowicz, 2014; Smalley et al., 2010). A large,

nationally representative study found that adults living in smaller metropolitan and semi-rural areas have a slightly elevated risk for developing major depression and serious mental illness compared to those living in large metropolitan and urban areas (Breslau et al., 2014).

Heightened behavioral health risks among non-urban populations may be due to many factors, including lower levels of access to behavioral health care, lower levels of mental health literacy, greater mental health stigma, and more financial stress (Andrilla et al., 2018; Morales et al., 2020; Smalley et al., 2010). Rural populations have significantly less access to behavioral health treatment compared to those living in urban areas (Andrilla et al., 2018; Morales et al., 2020). For example, there are a significant number of rural counties in the US that have no direct access to behavioral healthcare providers; approximately 65% of non-metropolitan counties contain no practicing psychiatrists, 47% have no psychologists, and 42% have no psychiatric nurse practitioners (Andrilla et al., 2018). Furthermore, individuals living in rural communities on average have lower incomes and educational status compared to non-rural individuals and are more likely to lack adequate health insurance (McCall-Hosenfeld et al., 2014). Rural populations are also less likely than urban populations to seek mental health services for reasons related to stigma (both public and self-directed), limited mental health literacy, and financial stress (Gamm et al., 2010; Morales et al., 2020). These unique characteristics of rural residents likely play a role in the increased prevalence of behavioral health issues as compared to populations living in other areas (Gamm et al., 2010; Morales et al., 2020). However, the cumulative data examining behavioral health outcomes across the rural-urban continuum has not conclusively shown a rural-urban disparity, with some mixed and inconclusive findings (Breslau et al., 2014; McCall-Hosenfeld et al., 2014).

Behavioral Health: Rural First Responders

Although there is emerging scientific literature focused on first responders, there is a significant dearth of research investigating the specific issue of behavioral health outcomes among rural first responders. There are fewer than 10 published studies available with the primary research goal of examining the behavioral health and wellness of rural first responders (e.g., Jones et al., 2018; Leung & Shen, 2022; Melton et al., 2019; Revicki et al., 1988). Notably, the majority of studies focused specifically on rural first responders have been based on populations outside of the US, (i.e., Australia, Canada) (Courtney, Francis, & Paxton, 2013; Pyper & Paterson, 2016; Regambal et al., 2015; Roberts et al., 2021). Most of the available research on rural first responders, based on US samples, has been investigated in the context of volunteer and wildland first responders, particularly firefighters and EMTs (Essex & Scott, 2008; Stanley et al., 2017; Stanley et al., 2018). However, even though most volunteer and wildland first responders serve in rural areas, most reported findings on behavioral health outcomes in these populations do not provide information on the population density of the work and thus may or may not generalize to rural first responder populations, generally. Furthermore, while a subset of wildland firefighters may relocate from urban to rural areas during fire season, others may live in the areas of the wildfires or other rural areas, and still others may ‘dispatch’ to rural areas to help with fire suppression during larger scale wildland fires. Given the limited literature on the nuances of the wildland firefighter population, this section will review all available literature on first responder populations most closely related to rural first responders, specifically referencing rural first responders as possible.

Rural first responders. Outside the contexts of volunteer and wildland workers, the behavioral health of rural first responders has been minimally researched. Jones et al. (2018) found that firefighters, EMTs, and paramedics working in rural Arkansas (sample size = 30)

were at an increased risk for PTSD, depression, and suicide compared to those working in urban areas of the state (sample size = 71). Results from a sample of 250 rural EMTs in the US found that there is a direct relationship between perceived occupational stress and increased depression among rural first responders (Revicki et al., 1988). Outside of the US, a survey of 632 rural paramedics, police officers, community nurses, and child protection staff in Australia during the COVID-19 pandemic found that these populations had significantly elevated levels of emotional exhaustion and were less satisfied with the training and support they received compared to their urban (sample size = 853) counterparts (Roberts et al., 2021). The same study found that the strongest associations with burnout and psychological distress in rural respondents was increased workload and lack of training/organizational communication (Roberts et al., 2021). An additional study focused on 150 Australian rural paramedics found significantly elevated levels of fatigue, depression, anxiety, stress, and poor sleep quality compared to general rural community samples (Courtney, Francis, & Paxton, 2013). In Canada, a sample of 181 rural first responders (i.e., Royal Canadian Mounted Police, British Columbia Ambulance Service, volunteer firefighters) was found to have significantly elevated levels of PTSD symptoms (10% of the survey sample met diagnostic criteria for PTSD); in the same study, first responders who reported perceiving chaos during traumatic events and experiencing resource limitations (e.g., inadequate equipment, limited training) endorsed higher PTSD symptom severity (Regambal et al., 2015). In terms of behavioral health service utilization, a study examining US firefighters with a history of suicidality found that rural firefighters are less likely to seek treatment and engage in services compared to urban firefighters (Hom et al., 2016).

Volunteer first responders. Volunteer first responders are individuals who are active participants in emergency service organizations but do not receive monetary compensation for

their work (Fahy et al., 2022; Cash et al., 2021). Notably, although most volunteer first responders serve in rural areas, most of the reported findings on behavioral health outcomes in volunteers do not provide information on the population density of where they work. Volunteer first responders comprise the majority of first responders in rural areas, primarily due to the limited funding for fire and EMS services in these regions (Jones et al., 2018). Indeed, a staggering 95% of volunteer firefighters in the US serve in departments that protect fewer than 25,000 people and 47% serve in departments that protect fewer than 2,500 people (Fahy et al., 2022). Additionally, 74% of volunteer EMS professionals in the US work in rural communities (Cash et al., 2021). In terms of behavioral health, volunteer firefighters report significantly elevated levels of depression, posttraumatic stress, and suicidal symptoms compared to career firefighters (Stanley et al., 2017). Volunteer firefighters additionally report greater structural barriers to behavioral health care (e.g., cost, availability of resources) compared to career firefighters, which is a potentially critical factor explaining the differences in behavioral health outcomes between the two groups (Stanley et al., 2017). For example, a study focused on a sample of 139 volunteer EMTs reported high emotional exhaustion (i.e., feelings of being emotionally overextended and exhausted by one's work) (Essex & Scott, 2008). Another survey of 658 EMTs found that volunteers reported higher levels of general stress compared to paid EMTs (Cydulka et al., 1997). However, to date, no study has explicitly compared specific behavioral health outcomes between volunteer and career EMTs.

Wildland firefighters. Wildland firefighters combat wildfires occurring in wilderness and wildland/urban interface areas, and are required to live in rural and remote areas of the country for extended periods of time (Aisbett et al. 2012; Stanley et al., 2018). Wildland firefighters perform their jobs while experiencing many unique stressors and working in extremely volatile

environments (Aisbett et al. 2012). As a result of these and other factors, wildland firefighters are at a higher risk for various behavioral health issues compared to others in the fire service, including PTSD, suicide, and sleep disturbance (Aisbett et al. 2012; Stanley et al., 2018). For example, one study found that the increased risk of suicide in wildland firefighters (sample size = 20) compared to non-wildland firefighters (sample size = 1,111) was related to increased social disconnectedness in the population, potentially due to the isolating nature of their work and lack of camaraderie with their peers (Stanley et al., 2018). Given the small sample of wildland firefighters included in the study, definitive conclusions about comparison findings cannot be drawn.

Conclusions

First responders in general are chronically exposed to trauma as well as occupational and relational stressors. They also face unique cultural and structural barriers in accessing behavioral health treatment services. Emergent research on first responder behavioral health has documented relatively heightened prevalence of PTSD (6.5% to 23.5% of the population), major depression and other mood disorders (7% to 22%), as well as anxiety disorders (4% to 22%), with many studies finding prevalence rates of these disorders to exceed those of the general population (Kleim & Westphal, 2011; Jones, 2017; White et al., 2023). Additionally, first responders are at an increased risk of other behavioral health issues, such as hazardous alcohol use, suicidal ideation, and sleep disturbances (Haugen et al., 2017; Jones, 2017).

There are also emergent distinctions in behavioral health outcomes between rural and urban first responder populations. Based on the few available published studies focused on rural first responders, this population appears to be at an even greater risk for PTSD, depression, and suicide compared to urban first responders (Jones et al., 2018). These increased behavioral health

issues in rural first responders may be due to a multitude of factors, including factors related to rural living and culture (e.g., lower levels of access to behavioral health care, less mental health literacy, greater mental health stigma) and factors related to rural first responder organizations (e.g., higher likelihood of being a volunteer department, less available resources, staffing issues, greater isolation on the job).

Future Directions

There are various future research directions that should be pursued based on our current knowledge of behavioral health outcomes among rural first responders. The following future directions are delineated as innovative next steps with significant public health impact for advancing the behavioral health of this understudied and underserved population:

- Development of large-scale surveys focused exclusively on understanding the behavioral health of rural first responders, including their perceived and actual needs for behavioral health services
- Examination of the current barriers to treatment among rural first responders seeking and/or receiving behavioral health services
- Development of longitudinal studies examining rural first responders' career trajectories, behavioral health symptoms, and treatment utilization
- Evaluation of the effectiveness of peer support programs in rural departments
- Exploration of technology-based interventions (e.g., smart phone applications, telemedicine) for addressing the unique behavioral health issues of rural first responders
- Evaluation of the effectiveness of programs that target stigma and provide education supporting mental health literacy to elevate awareness of the stress faced by first responders in rural areas

- Development of rural first responder specific behavioral health interventions, including programs that focus on substance use and suicide risk prevention for this population

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