The Effects of COVID-19 on the Mental Health of First Responders
A Review of the Lebanon Fire Department

Caroline Baber1, OMS-III, Mandilin Hudson1, DO
2Western University of Health Sciences, College of Osteopathic Medicine of the Pacific Northwest, Lebanon, OR, USA

Introduction
Early research conducted on mental health within the scope of COVID-19 in China found that 54% of health care workers reported the psychological impacts of the pandemic to be moderate or severe with 29% reporting moderate to severe anxiety as a result (Cullen et al., 2020). This is significant because people with an established mental health disorder have lower life expectancies and poorer physical health outcomes when compared to the general public (Roberts et al., 2018).

First responders are faced with additional changes as the first people on scene. They see the full impacts of trauma before any medical care can be rendered and often are faced with severe triage situations, having to prioritize the lives of those that can be saved given their resources. This can further contribute to mental health disorders – something that was brought to light following the September 11, 2001 terrorist attacks in New York.

For the firefighters and EMS personnel on scene immediately following, individuals were found to have post-traumatic stress disorder, anxiety, depression, survivor guilt, insomnia, risk-taking behavior, and other mental health conditions in the months and years following (Smith et al., 2020). PTSD was reported at a rate at least twice as high as that expected by the general population (Smith et al., 2020) and was found to increase alcohol consumption and tobacco smoking among those affected (Smith et al., 2010). Thus, we can conclude that mental health concerns are real among first responders and increase when exposed to traumatic events.

Objective
The goal of the project is to analyze how COVID-19 has affected the mental health of firefighters and EMS workers within the Lebanon Fire Department. Using questions from the General Anxiety Disorder 7 (GAD-7) questionnaire and Patient Health Questionnaire 2 (PHQ-2), first responders will be asked to assess their mental health both before and after the COVID-19 outbreak in Oregon. This will allow us to quantify the changes in mental health status among first responders thus allowing organizations to implement systemic changes as needed to help their employees. We hypothesize that COVID-19 will negatively impact mental health among first responders correlating with increasing scores on the GAD-7 and PHQ-2.

Study Design
An anonymous online survey was administered to first responders – defined as firefighters, EMTs, and paramedics – within the Lebanon Fire Department. Participants were asked to access their mental health using GAD7 and PHQ2 screening tools both pre- and post the onset of COVID-19 in Oregon, defined as February 28, 2020. Data was collected during November 2020 and used recall to access pre-pandemic scores. Full time paramedics, EMTs, and firefighters were assessed using the standardized General Anxiety Disorder 7 (GAD-7) questionnaire and Patient Health Questionnaire 2 (PHQ-2). Results were analyzed using a Wilcoxon Rank Sum test with a significance level of 0.05.

Results
Average anxiety increased significantly from 1.8 to 4.9 (p value = 0.019) following the onset of the pandemic on February 28, 2020 (Fig. 2). This correlates to a clinical anxiety level rise from mild to moderate. For 11 of the 13 individuals assessed in this study, GAD7 scores increased with the most significant being a jump from a GAD7 score of 0, corresponding to no anxiety, to a GAD7 score of 15, corresponding to severe anxiety (Fig. 1).

On average, those participating in deliberate wellness activities – including counseling, support groups, exercise, etc. – had a smaller increase in GAD7 score pre- versus post-pandemic compared to those who did not (Table 1). However, this result was not statistically significant with a p-value of 0.387. Depression levels increased significantly from 0 to 1.3 (p value = 0.037), however this does not correlate to a clinically significant screening as 0 and 1.3 correspond to no depression on PHQ2 screenings (Fig. 5).

Discussion
Anxiety and depression have significant impacts on the overall health of those affected, correlating to lower life expectancies and poorer physical outcomes. Therefore, it is important that we evaluate the impact of mental health on those around us. It was found that first responders had increases in both anxiety and depression screening tools in response to the COVID-19 pandemic. From this information, we can conclude that COVID-19 has had a negative impact on the mental health of first responders.

Conclusions
As many as 30% of adults in the United States demonstrate some form of anxiety or depression – diseases which can be amplified by acute stressors such as COVID-19. For those working as first responders, it is important that we are not only aware of mental health disorders but help provide those affected with resources to lessen the burden. Though this study only assessed the Lebanon Fire Department, it is likely that other departments would yield similar results in response to anxiety and depression levels. From this knowledge, first responders and their employers should implement changes to increase mental health care and wellness as needed to help their employees.

References

Acknowledgements
Thank you to the Lebanon Fire Department for agreeing to participate this study as well as Johanne Sparr for her help with data analysis. Approval for this study was obtained by the Western University of Health Sciences Institutional Review Board and references X2018/1483.

Table 1. Effects of participation in deliberate wellness activities – including counseling, support groups, exercise, etc. – on average GAD7 scores pre-pandemic, post-pandemic, and the change in these scores.

<table>
<thead>
<tr>
<th>Participation in Wellness Activities</th>
<th>Average Pre-Pandemic GAD7 Score</th>
<th>Average Post Pandemic GAD7 Score</th>
<th>Average Change In GAD7 Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>1.14</td>
<td>3.67</td>
<td>2.53</td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
<td>6.00</td>
<td>5.00</td>
</tr>
</tbody>
</table>

Figure 1. Changes in GAD7 scores pre- and post-pandemic onset.

Figure 2. Comparison of average GAD7 score for first responders within UFO pre- and post-pandemic. P value = 0.019 (alpha = 0.05), n=13.

Figure 3. Comparison of average PHQ2 score for first responders within UFO pre- and post-pandemic. P value = 0.037 (alpha = 0.05), n=13.

Figure 4. Comparison of average PHQ2 score for first responders within UFO pre- and post-pandemic. P value = 0.037 (alpha = 0.05), n=13.