

MMHPI COVID-19 Response Briefings

Projected COVID-19 MHSUD Impacts, Volume 1: Effects of COVID-Induced Economic Recession (COVID Recession) – April 28, 2020, Full Version¹

The current COVID-19 pandemic itself and the economic impact of mitigation efforts imposed to control it are both expected to result in direct increases in rates of mental health and substance use disorders (MHSUD), including deaths associated with suicide,² overdose, and violence (especially domestic violence).³ The Meadows Mental Health Policy Institute (MMHPI) is carrying out a series of projections of these impacts to inform policy makers. This first volume focuses on the most readily calculable impacts related to the effects of mitigation efforts on the economy. The relationships between economic downturns and MHSUD impacts are relatively well-established, and there is evidence that the correlation in America between deaths from suicide and recession are stronger in Texas than other states,⁴ so we have started there.

In the weeks to come, MMHPI will expand on these initial estimates and also add projections related to the broader effects of the pandemic, including exposure to chronic, unpredictable life-threatening stressors and both grief and trauma related to mass illness and mortality. These projections are not intended to question the necessity of virus mitigation efforts, but rather to inform health system planning regarding how this pandemic, and its effects upon the economy, may impact the MHSUD needs of Texans. We also computed state-level impacts more broadly.⁵

These MHSUD effects are complex and to a large degree depend on the experience of specific communities related to the pandemic. Models suggest that mitigation efforts currently in place

¹ The core projections of this report were released in a prior version on 4/10/2020; that version of the briefing can be found at: <https://www.texasstateofmind.org/uploads/whitepapers/COVID-MHSUDImpacts-10April2020.pdf>. The 4/21/2020 version of this paper was identical to the 4/28/2020 version, other than the addition of the 4/28/2020 state-level appendix, edits to this footnote, and streamlining of language in footnote 17. The 4/28/2020 version of this report was modified on 6/11/2020 to remove repetitious text.

² Reger, M. A., Stanley, I. H., & Joiner, T. E. (2020, April 10). Suicide mortality and coronavirus disease 2019 – A perfect storm? *JAMA Psychiatry*.

https://jamanetwork.com/journals/jamapsychiatry/fullarticle/2764584?guestAccessKey=f2f362c5-c3d1-473f-9c44-8ec3c547f400&utm_source=silverchair&utm_medium=email&utm_campaign=article_alert-jamapsychiatry&utm_content=olf&utm_term=041020

³ Pappas, S. (2020, April 6). *How will people react to the new financial crisis?* American Psychological Association. <https://www.apa.org/news/apa/2020/04/financial-crisis-covid-19>

⁴ Reeves, A., Stuckler, D., McKee, M., Gunnell, D., Chang, S. S., & Basu, S. (2012). Increase in state suicide rates in the USA during economic recession. *Lancet*, 380(9856):1813–1814. doi:10.1016/S0140-6736(12)61910-2

⁵ Meadows Mental Health Policy Institute. (April 28, 2020). Projected COVID-19 MHSUD Impacts, Volume 1: Effects of COVID-Induced Economic Recession (COVID Recession), Appendix of State-Level Estimates.

<https://www.texasstateofmind.org/uploads/whitepapers/COVID-MHSUDImpacts-StateAppendix.pdf>

are reducing the size of the pandemic,⁶ which would in turn also reduce the size of some MHSUD impacts. In addition, previous MMHPI analysis of the potential effects of natural disasters on MHSUD rates completed in response to Hurricane Harvey found that most trauma impacts manifest 60 to 90 days following exposure to the stressors,⁷ though the sustained and unpredictable length of the pandemic stressors may change that pattern. But such effects can continue to manifest in MHSUD-related morbidity and mortality for years.

Our analysis begins with economic effects. Current estimates of the impact of mitigation efforts associated with the pandemic range broadly,⁸ but a rigorous model released by the Organization for Economic Cooperation and Development (OECD) in late March estimated a 25% decrease in economic activity in large developed economies during the period of widespread containment measures.⁹ The speed of recovery is dependent on a host of unknown factors, including the ability to rapidly contain the virus, as well as the reorganization of disrupted supply chains and effects of federal and state policies (including the rescue package approved by Congress in late March and subsequent action expected in the weeks to come). Changes in business and consumer confidence are also critical.

For this briefing, MMHPI assumes that these macroeconomic changes will result in a mitigation-induced economic recession (COVID recession), and estimates the plausible range of increased MHSUD needs related solely to that. Using estimates derived from the severe recession of 2007–2009, this analysis focuses on the association between recession and increases in three areas: suicide, overdose deaths, and substance use disorders. The underlying studies used in these estimates are specific to the U.S. and are relatively recent.¹⁰

While we do not yet know the extent of any upcoming recession, in the last two full weeks of March and first two weeks of April, over 22 million Americans filed for unemployment for the

⁶ The widely cited University of Washington “Murray Model” has shown lower estimates through April. Estimates on the date of this report for Texas projected just over 950 deaths from COVID-19. For current estimates, see: <https://covid19.healthdata.org/united-states-of-america>

⁷ MMHPI. (2017, November 30). *Hurricane / Tropical Storm Harvey impact on child and youth mental health*. Retrieved on April 15, 2020, from <https://www.texasstateofmind.org/uploads/whitepapers/HarveyImpact.pdf>

⁸ U.S. Chamber of Commerce. (2020, March 16). *Quick take: Coronavirus’ economic impact*. <https://www.uschamber.com/series/above-the-fold/quick-take-coronavirus-economic-impact>

⁹ Organization for Economic Cooperation and Development (OECD) Economics Department. (2020, March 27). *Evaluating the initial impact of COVID containment measures on activity*. Secretary-General of the OECD.

https://read.oecd-ilibrary.org/view/?ref=126_126448-kcrc0cs6ia&title=EVALUATING_THE_INITIAL_IMPACT_OF_COVID_CONTAINMENT_MEASURES_ON_ECONOMIC_ACTIVITY&mod=article_inline

¹⁰ We are representing the size of the COVID recession through increases in unemployment, while the drivers of these MHSUD impacts may be other related economic changes, such as loss of retirement income, home values, or reduced future economic opportunity. Our analysis approach captures all of these correlated economic factors in a single measure, the unemployment rate. It would also be useful for future models to disaggregate the predicted MHSUD impacts by type of economic change, as well as non-economic factors related to COVID-19.

first time,¹¹ which is approximately thirteen percent (13%) of the U.S. workforce of 164.5 million¹² estimated at the end of February. While dire, it is not yet clear how long this period of high unemployment will last. Therefore, in this briefing we provide a range of conceivable outcomes, running from a recession as severe as the recession of 2007–2009 – when unemployment increased five percentage points (5%)¹³ – to an upper bound of a 20 percentage point (20%) increase, which approaches the 23 percentage point (23%) increase in unemployment experienced in the Great Depression. Some models posit rates of unemployment in the second quarter over 30 percent,¹⁴ but the effects in this paper focus on the cumulative impact of rates of unemployment over a year (not just a single quarter). Additionally, because Texas is a leader in oil and gas production, and the pandemic has been accompanied by a collapse in oil prices, we provide additional analysis for unemployed workers in that sector at the end of this briefing. Finally, the goal of this paper is to inform the efforts of policy makers and health systems to prepare for increases in needs related to MHSUD, so hopefully mitigation efforts to reduce these needs – and health system responses when these needs present – will also result in less morbidity and mortality than in past recessions.

In summary, we project that for every five percentage point increase in unemployment in Texas during the COVID recession across a year, an additional 725 Texans could die each year from suicide (300) and drug overdose (425).

I. Projected Increases in Deaths from Suicide

Using data from many countries and different recessionary periods, researchers have consistently found that reduced per capita GDP and associated rises in unemployment are directly associated with increases in suicide.^{15, 16} It is also important to keep in mind that, for every person who dies from suicide, many more experience suicidal thoughts and even more

¹¹ U.S. Department of Labor. (2020, April 16). *Unemployment insurance weekly claims* [News release]. <https://www.dol.gov/ui/data.pdf>

¹² U.S. Bureau of Labor Statistics. (n.d.). *Labor force statistics from the current population survey*. Retrieved on April 10, 2020, from https://data.bls.gov/pdq/SurveyOutputServlet?graph_name=LN_cpsbref1&request_action=wh

¹³ The annual unemployment rate increased from 4.6% in 2007 to 9.6% in 2010. Bureau of Labor Statistics. (2020, April 3). *Economy at a glance: United States*. <https://www.bls.gov/eag/eag.us.htm>

¹⁴ Faria-e-Castro, M. (2020, March 24). *Back-of-the-envelope estimates of next quarter's unemployment rate*. Federal Reserve Bank of St. Louis. Retrieved on April 20, 2020, from <https://www.stlouisfed.org/on-the-economy/2020/march/back-envelope-estimates-next-quarters-unemployment-rate>

¹⁵ Reeves, A., Stuckler, D., McKee, M., Gunnell, D., Chang, S. S., & Basu, S. (2012).

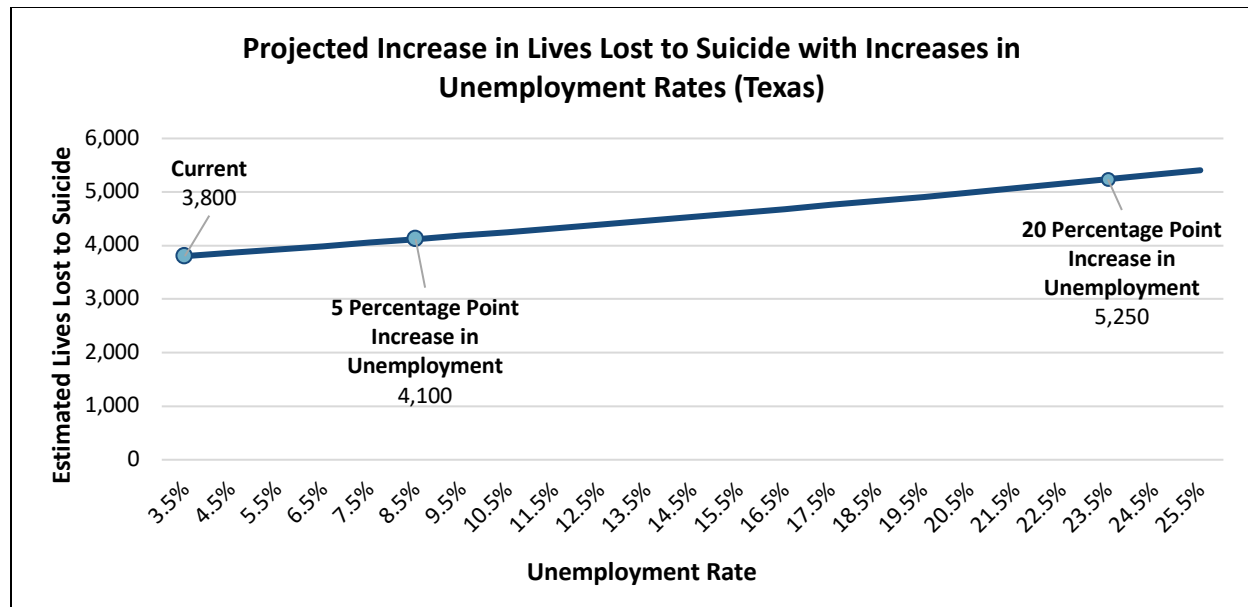
¹⁶ Frasilho, D., Matos, M. G., Salonna, F., Guerreiro, D., Storti, C. C., Gaspar, T., & Caldas-de-Almeida, J. M. (2016, February 3). Mental health outcomes in times of economic recession: A systematic literature review. *BMC Public Health*, 16, 115. <https://doi.org/10.1186/s12889-016-2720-y> A few credible sources challenge the conclusion that unemployment is the causal factor. See, for example, Harper, S., & Bruckner, T. (2017, July). Did the Great Recession increase suicides in the USA? Evidence from an interrupted time-series analysis. *Annals of Epidemiology*, 27(7), 409–414. <https://doi.org/10.1016/j.annepidem.2017.05.017>

experience MHSUD associated with suicide, especially depression.¹⁷ Based on U.S. state-level data from 1997 to 2010, which includes the 2007–2009 recession, each percentage point increase in the unemployment rate results in a 1.6% increase in the suicide rate.¹⁸ MMHPI estimates that a COVID recession on par with the 2007–2009 recession (in which U.S. workers experienced a 5% increase in unemployment) would result in the loss of a nearly 4,000 additional Americans per year to suicide because of unemployment alone. To the extent that this relationship is linear, with each additional percentage point increase in the rate of unemployment, approximately 775 more Americans would be lost to suicide. If the unemployment rate were to increase by 20%, just exceeding the 23% unemployment rate during the Great Depression, MMHPI estimates that approximately 18,000 more Americans could die from suicide.

In terms of the impact on Texas, MMHPI's model projects that each percentage point increase in the unemployment rate would result in 60 additional lives lost to suicide each year. In 2018, just over 3,800 Texans died from suicide. With each five percentage point increase in unemployment, just over 300 additional Texans would die. The figure below illustrates the additional lives that would be lost to suicide in Texas if unemployment worsens.

¹⁷ Han, B., et al. (2017). National trends in the prevalence of suicidal ideation and behavioral among young adults and receipt of mental health care among suicidal young adults. *Journal of the American Academy of Child & Adolescent Psychiatry*, 57(1), 20- 27. DOI: <https://doi.org/10.1016/j.jaac.2017.10.013>. A comparison of these reported ideation rates to completed suicides demonstrates that suicidal ideation occurs at a rate that is between 30 and 240 times that of completed suicides.

¹⁸ Phillips, J. A., & Nugent, C. N. (2014). Suicide and the Great Recession of 2007–2009: The role of economic factors in the 50 U.S. states. *Social Science & Medicine*, 116:22–31. doi:10.1016/j.socscimed.2014.06.015. The magnitude of effect sizes reported in the academic literature varies according to the period of data used and analytic method employed. Given that Texas had the strongest correlation between unemployment and suicide (Reeves, et al, 2012) and because of the likelihood of multiple factors increasing MHSUD in response to COVID-19, this paper focuses on the upper range of the credible effect sizes with a conservative estimate of the potential increase in unemployment (5% increase). The effect size of 1.6% reported in Phillips et al, (2014) is based on a logarithmic (log) transformation of the suicide rate to permit reporting change in suicide rates as a percentage. We use the exact percentage change formula associated with log dependent variables when estimating the effect of a 20 percentage point increase in the unemployment rate on suicide. With this approach, the association between unemployment rate and suicide becomes slightly non-linear for large changes in unemployment. Therefore, the total deaths calculated for a 20% increase are more than four times the annual rate observed for a 5% increase.



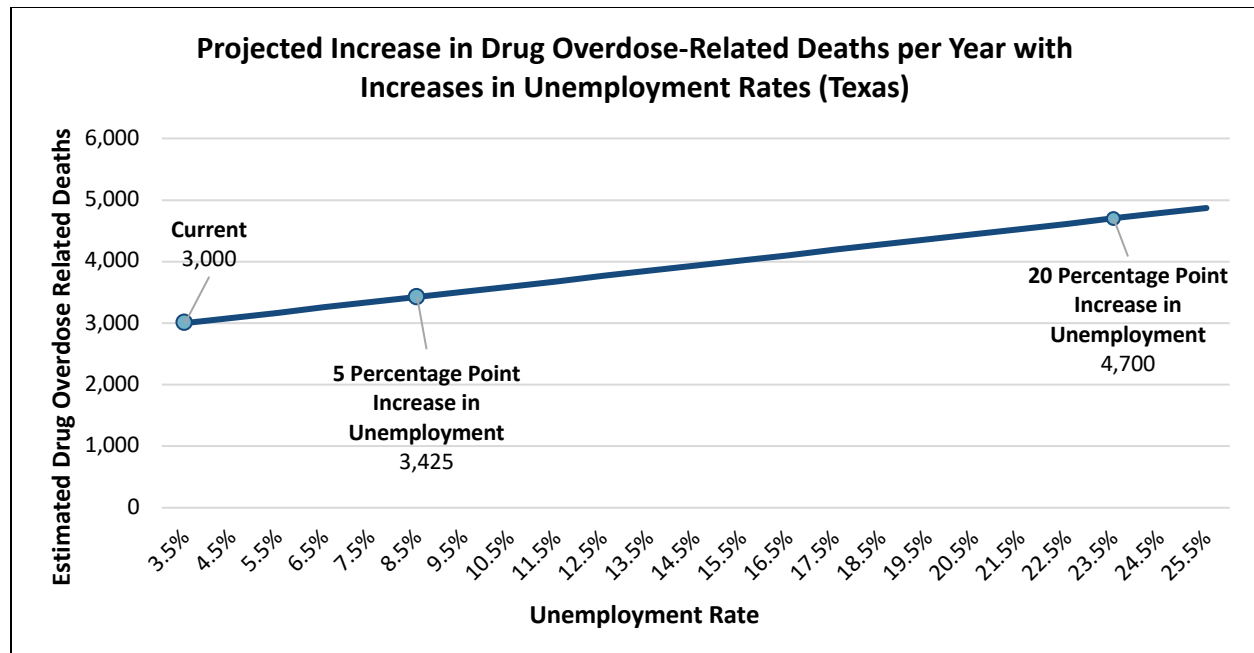
II. Projected Increases in Deaths Due to Overdose and Substance Use Disorders

Increases in unemployment rates are also associated with increased rates of substance use disorders (SUD) and overdose deaths. Brown and Wehby¹⁹ used state-level data from 1999 to 2014 to estimate the association between unemployment and drug overdose-related deaths. They found that each one percentage point increase in unemployment was associated with an increase of 0.334 overdose deaths per 100,000 people.²⁰

Using this effect size, each 5% increase in unemployment would result in an additional 5,500 overdose-related deaths across the U.S. per year. If the unemployment rate increases by 20%, MMHPI estimates that more than 22,000 Americans could lose their lives from drug overdoses related to unemployment alone. In Texas, this would translate to just over 425 additional drug overdose-related deaths (including opioid overdoses). The figure below illustrates the additional lives that would be lost to drug overdose in Texas if unemployment worsens.

¹⁹ Brown, E., & Wehby, G. L. (2019). Economic conditions and drug and opioid overdose deaths. *Medical Care Research and Review*, 76(4), 462–477. <https://doi.org/10.1177/1077558717722592>

²⁰ Brown and Wehby’s focus is on disaggregating additional deaths because of increased unemployment versus other economic fallout of recession. Because we are interested in estimating total additional overdose deaths resulting from recession, and not specifically those attributed to unemployment, we used estimates that do not hold other recession-related factors constant.

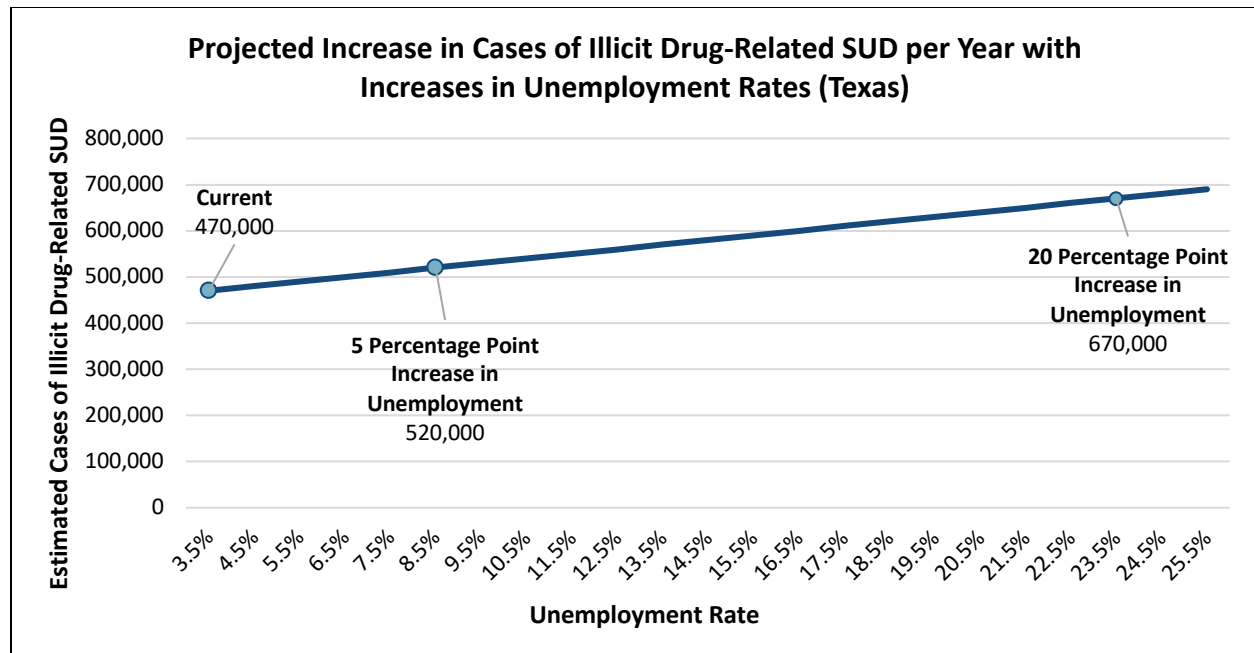


Additionally, there is a well-established relationship between substance use and efforts to cope with stress more broadly, and unemployment is strongly associated with increases in substance use disorders (SUD).²¹ Accordingly, MMHPI also estimated the increase in the prevalence rate of SUD overall by comparing prior data on SUD in unemployed versus unemployed populations. Based on data from the National Survey on Drug Use and Health,²² we estimated that 10% of unemployed adults have an SUD involving an illicit drug (including opioid use disorders), while the rate for adults who are employed is 3%.

Using the difference in the prevalence of illicit SUD between employed and unemployed people, a national increase of 5% in the unemployment rate is projected to result in an additional 600,000 cases of SUD per year across the country. For Texas, each 5% increase in unemployment would result in just over 50,000 additional cases of SUD per year. The figure below illustrates the additional Texans who will suffer substance use disorders each year if unemployment worsens.

²¹ Compton, W. M., Gfroerer, J., Conway, K. P., & Finger, M. S. (2014, June 14). Unemployment and substance outcomes in the United States 2002–2010. *Drug and Alcohol Dependence*, 142, 350–353.

²² Substance Abuse and Mental Health Services Administration. (2019). *Results from the 2018 National Survey on Drug Use and Health: Detailed tables* (Difference in unemployed and employed rate, NSDUH, 2018, table 5.3B Illicit drug use disorder in past year among persons aged 12 or older, by age group and demographic characteristics percentages, 2017 and 2018) [Data set]. U.S. Department of Health and Human Services. <https://www.samhsa.gov/data/>



III. Impact on Petroleum Extraction Workers and Related Industries

One group of workers that is especially likely to experience elevated levels of unemployment are those who work in the oil and gas extraction industry. This sector has experienced rapid growth over the last decade, with concentrated production in Texas. The COVID recession, coupled with oversupply and strategic behavior on the part of Saudi Arabia and Russia, are likely to lead to a prolonged period of low prices and rapidly declining U.S. production. According to the U.S. Bureau of Labor Statistics, in the third quarter of 2019, there were just over 230,000 people employed in Texas in oil and gas extraction enterprises,²³ and hundreds of thousands of other Texas workers have jobs that depend on the oil industry. Early indicators are that over 1 million Texans have filed for unemployment as of early April, with over 700,000 filing in the last month, and these estimates are assumed by many to be low.²⁴

The effects of these job losses on unemployment in Texas over the longer-term are uncertain,²⁵ but the breadth of the COVID recession across the economy gives added reason for concern. Conventionally, a shutdown in oil and gas production would result in worker transitions to employment in other industries. However, given the more general recession that is anticipated

²³ Bureau of Labor Statistics. (2020). *Industries by supersector and NAICS code*. Retrieved on March 30, 2020, from https://www.bls.gov/iag/tgs/iag_index_naics.htm

²⁴ Ferman, M., Novak, A., & Proctor, C. (2020, April 9). More Texans filed for unemployment in the last 4 weeks than all of 2019. *The Texas Tribune*. <https://www.texastribune.org/2020/04/09/761262-texans-filed-unemployment-claims-first-month-coronavirus/>

²⁵ Ashbury, K. (2020, April 7). Texas economist: Covid response, oil price free fall ‘devastating but temporary.’ *The Center Square*. https://www.thecentersquare.com/texas/texas-economist-covid-response-oil-price-free-fall-devastating-but-temporary/article_00f85028-78f2-11ea-b203-a39bfaabefc4.html

as a result of COVID-19, there is the possibility of much higher levels of unemployment for workers in this and related sectors, so public health estimates related to unemployment in Texas should be based to the fullest extent possible on Texas data, and any estimates based on national employment data should be assumed for the present to be low.

IV. Context and Additional Considerations

Readers should be mindful that this briefing presents estimates of the potential range of lives lost to suicide and drug overdose, and the actual level of mortality that will result is subject to many more variables. First, our projections are built on a two-year-old suicide rate from 2018, the latest data available from the Centers for Disease Control and Prevention. The 2018 age-adjusted suicide rates are higher than they have been since 1941.²⁶ Given the consistently increasing rate of suicide since the 1990s,²⁷ it is likely that the suicide rate in 2020 is much higher than the 2018 rate that we used to generate our projections. Further, suicide rates were on the rise with (or without) COVID-19. Therefore, increases in unemployment related to the COVID recession will occur in the context of an increasing risk for suicide across the United States, and the directionality of that context is unclear. In addition, international studies tell us that the greatest increases in suicide occur when unemployment rates are low.²⁸ When the COVID-19 pandemic began, the United States was recording very low unemployment rates (around 3.5%).²⁹ Therefore, it is possible that we are conservatively estimating the number of Americans who die from unemployment-related suicide in this report. Conversely, models suggest that mitigation efforts currently in place for COVID-19 are reducing the scope of the pandemic, which could in turn also reduce the size of some MHSUD impacts.

Other factors that could skew actual experience higher or lower than our projections include micro-level correlates associated with disparities for subsets of the population, including hourly and minimum wage workers, seasonal employees, and those employed in various sectors (e.g., hospitality, tourism, retail, and oil/gas).³⁰ These micro-level experiences are essential in understanding the scope of how the pandemic will affect individuals given that there is no real comparison to serve as a proxy for the COVID-19 related social isolation, loneliness,

²⁶ Drapeau, C. W., & McIntosh, J. L. (2020, February 12). U.S.A. suicide: 2018 official final data. Washington, DC: American Association of Suicidology. https://suicidology.org/wp-content/uploads/2020/02/2018datagsv2_Final.pdf

²⁷ Planalp, C., & Hest, R. (2019, October). *Suicide rates on the rise: National trends and demographics in suicide deaths from 2000 to 2017*. Robert Wood Johnson Foundation, State Health Access Data Assistance Center. https://www.shadac.org/sites/default/files/publications/National%20Suicide%20Rates%20Brief_10.2019.pdf

²⁸ Nordt, C., Warnke, I., Seifritz, E., & Kawohl, W. (2015). Modelling suicide and unemployment: a longitudinal analysis covering 63 countries, 2000–11. *The Lancet Psychiatry*, 2(3), 239-245.

²⁹ United States Department of Labor. (2020). The Employment Situation – March 2020. Report # USDL 20-0521.

³⁰ Zandi, M. (2020, March 16). *COVID-19: A fiscal stimulus plan*. Moody's Analytics. Retrieved on April 12, 2020, from <https://www.economy.com/economicview/analysis/378644/COVID19-A-Fiscal-Stimulus-Plan>

psychological distress,³¹ substance use, and fear that has broadly impacted the U.S. population.^{32, 33} Future modeling could employ these micro-level data to refine projections.

There are also notable statistical considerations underlying these projections that are likely to vary from actual experience. For example, the studies underlying our projection assume that trends in suicide are linear and that our rates will apply equally across the United States. Both of these assumptions are unlikely to be valid, as suicide change rates vary substantially³⁴ across state, county, and municipal lines³⁵ and demographic characteristics. The assumption of a linear relationship between unemployment and suicide is particularly important for the larger percentage point increase forecasts, since this is outside of the unemployment increases in the studies underlying the model. This concern does not apply to lower estimates such as a five percent (5%) increase.

Further, COVID-19 has impacted all Americans in a novel way that transcends insights available from studies of prior events. To explore this in our estimates, we calculated confidence intervals that show the range of likely deaths due to unemployment. These confidence intervals, which were based on the published data from which our projections were generated, were quite small and led to a margin of error of only one or two deaths per one percent increase in unemployment. Therefore, given the uncertainty associated with projecting suicide into the future, we elected to present our projections as estimates only and discuss the caveats that should be used when interpreting our projections.

Broadly speaking, the MHSUD effects described in this report are complex and to a large degree depend on the pandemic-related unemployment experienced in specific communities, other

³¹ Keeter, S. (2020, March 30). *People financially affected by COVID-19 outbreak are experiencing more psychological distress than others*. Pew Research Center. Retrieved April 20, 2020, from <https://www.pewresearch.org/fact-tank/2020/03/30/people-financially-affected-by-covid-19-outbreak-are-experiencing-more-psychological-distress-than-others/>

³² Bruce, G., Nguyen, H., Ballard, J., & Sanders, L. (2020, March 27). *COVID-19 report: How the virus is affecting everything, from politics to brands*. Retrieved on April 12, 2020, from <https://today.yougov.com/topics/science/articles-reports/2020/03/12/covid-19-report-how-virus-affecting-world-politics>

³³ Clay, R. (2020, March 18). *COVID-19 isn't just a danger to older people's physical health*. American Psychological Association. Retrieved on April 12, 2020, from <https://www.apa.org/news/apa/2020/03/covid-19-danger-physical-health>

³⁴ Stone, D. M., Simon, T. R., Fowler, K. A., Kegler, S. R., Yuan, K., Holland, K. M., Ivey-Stephenson, A. Z., & Crosby, A. E. (2018). *Vital signs: Trends in state suicide rates – United States, 1999-2016 and circumstances contributing to suicide – 27 states, 2015* (Morbidity and Mortality Weekly Report Series 67, Issue 22). Centers for Disease Control and Prevention. <https://doi.org/10.15585/mmwr.mm6722a1>

³⁵ Muro, M., Maxim, R., & Whiton, J. (2020, March 17). *The places a COVID-19 recession will likely hit hardest*. Brookings: The Avenue. Retrieved on April 12, 2020, from <https://www.brookings.edu/blog/the-avenue/2020/03/17/the-places-a-covid-19-recession-will-likely-hit-hardest/>. MMHPI has found substantial variation across Texas counties statewide in the rates of death from suicide that it has analyzed in more than a dozen Texas regions.

factors not incorporated into the model, and potential reductions in MHSUD morbidity and mortality due to mitigation efforts to reduce these needs, and health system responses when these needs present.