



Insights into Suicide-Related Trends

VISUALIZING & ANALYZING SAMHSA'S 2021
NATIONAL SURVEY ON DRUG USE AND HEALTH
STATISTICS

Jorge Valderrama, PhD

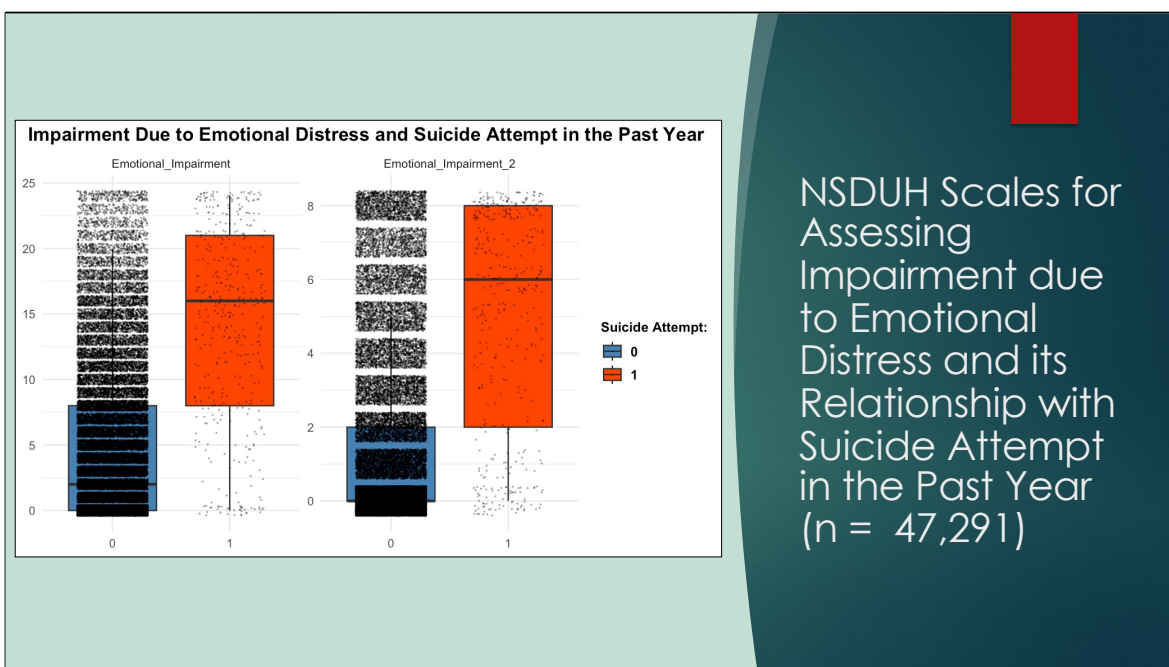
Process for exploring SAMHSA's NSDUH 2021 dataset

- ▶ I downloaded the dataset for SAMHSA's 2021 National Survey on Drug Use and Health Statistics that was released in January of 2023
- ▶ The dataset includes data for 58,034 respondents and 2,988 variables
- ▶ I reviewed the codebook to initially extract 40 variables for exploration (including suicidal ideation, having a suicide plan, and having a suicide attempt in the past year)
- ▶ The rmd file in the associated github repository includes the code I used in R for visualizing and analyzing the data (the pdf file labeled "NSDUH 2021 Data Explortation Rmarkdown Output" includes the code and each visualization and statistical analysis prepared)
- ▶ I created a total of 13 data frames by filtering the larger dataset, which were then used in my exploration of the data. The number of observations in the data frames ranged from 972 to 47,291.

Suicidal Thoughts & Behaviors Among Adults in the Past Year (2021)

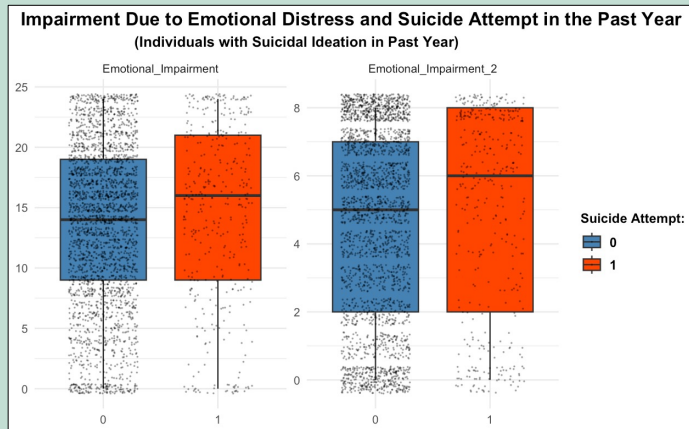
	Yes	No
Suicidal Ideation	6.7% (n = 3177)	93.3% (n = 44,144)
Suicide Plan	2.1% (n = 972)	97.9% (n = 46,319)
Suicide Attempt	0.92% (n = 435)	99.08% (n = 46,856)

I filtered the larger data set to only include adults



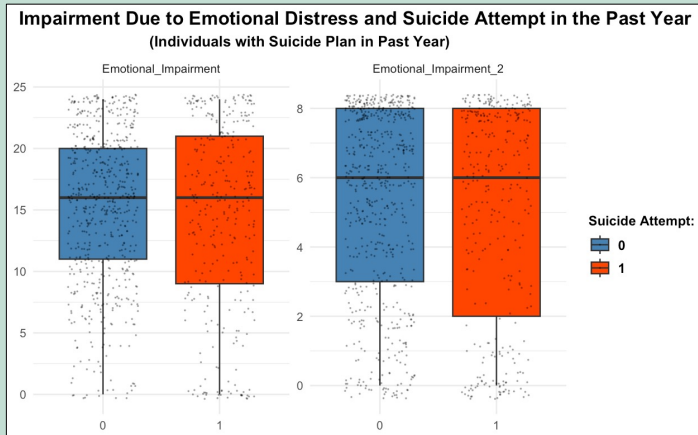
The NSDUH dataset has 2 scores that reflect how much difficulty respondents experienced in doing eight daily activities in the one month in the past year when they were at their worst emotionally.

You can read these graphs as follows: With regards to survey respondents who reported a suicide attempt in the past year (red box), they are on average, have higher scores in scales assessing impairment in daily activities due to emotional distress than respondents that did not report a suicide attempt in the past year (blue box). The thick horizontal line within each box denotes the median. The box encompasses 50% of all cases (i.e. from the 25 percentile to the 75 percentile). The jitter points show you where all of the respondents are located within each group. Comparing the medians, you can see that both scales are good predictors of whether someone has or has not had a suicide attempt in the past year.



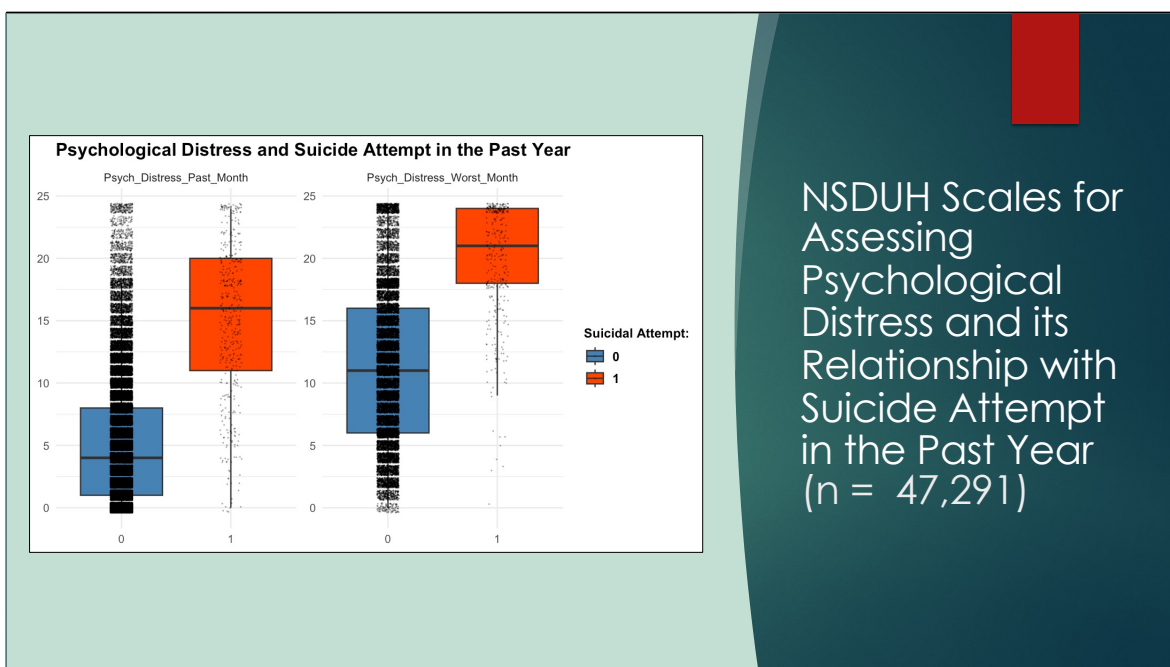
Among Individuals
with Suicidal
Ideation in the Past
Year (n = 3,177)

This is the same analysis, but only looking at the sample of respondents with ideation in the past year. The median score is still higher in respondents who reported a suicide attempt in the past year.

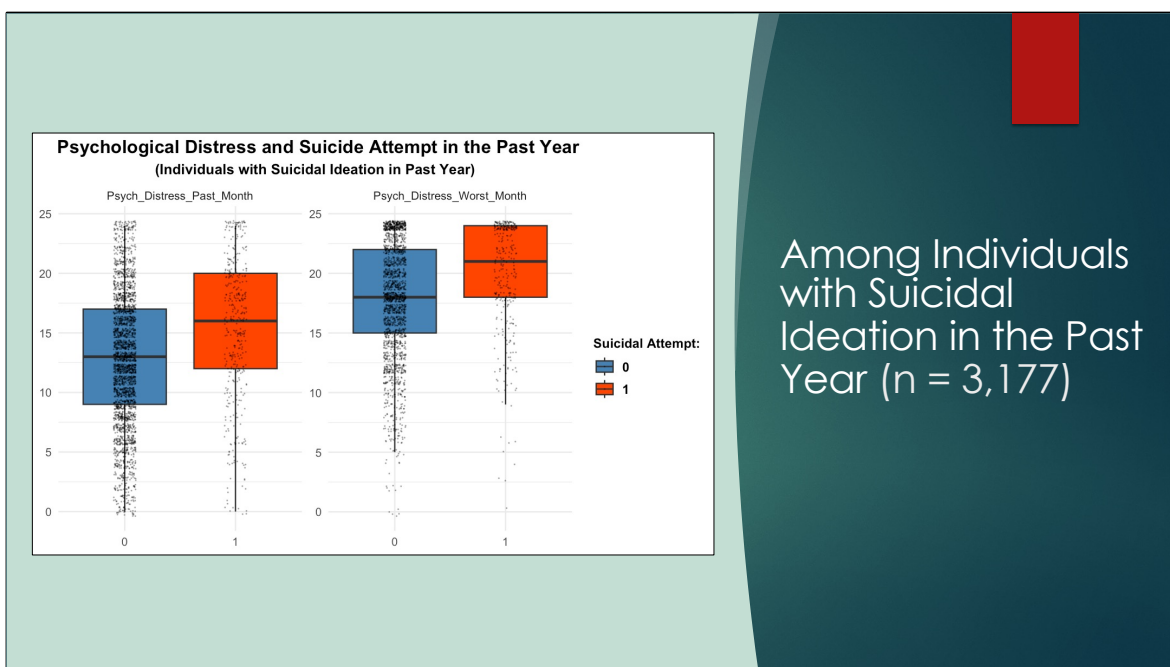


Among
Individuals with
a Suicide Plan
in the Past Year
(n = 972)

This is the same analysis, but only looking at the sample of respondents with a suicide plan in the past year. The median scores are closer, indicating that the scales are not doing as a good as a job predicting a suicide attempt in the past year than when looking at the larger sample.

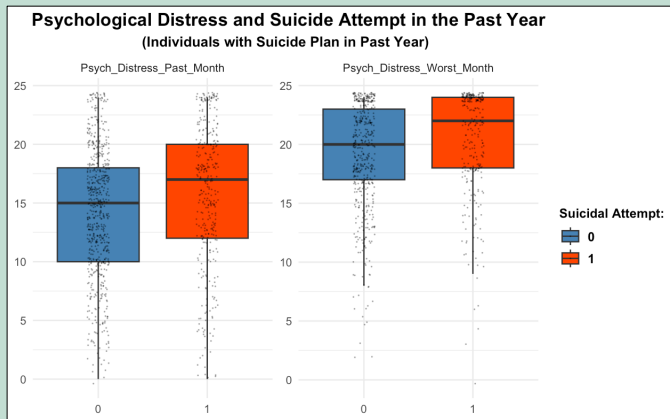


The NSUD dataset also has 2 other scores that reflect how much psychological distress has experienced in the past month and what they consider their worst month emotionally in the last year. These scales show a stronger prediction of suicide attempt than the previously shown scales.



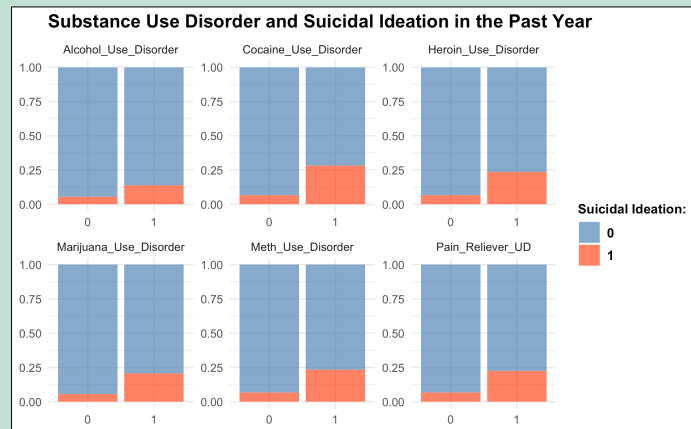
Among Individuals
with Suicidal
Ideation in the Past
Year (n = 3,177)

Same analysis, but only looking at the sample of respondents with ideation in the past year. The scales still are good predictors of attempt in the ideation subset.



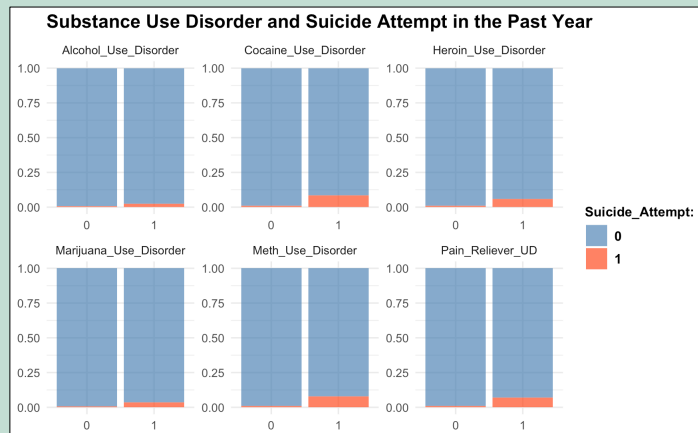
Among Individuals
with a Suicide Plan in
Past Year (n = 972)

This is the same analysis, but only looking at the sample of respondents with a suicide plan in the past year. The scales continue to be good predictors of attempt in the past year. The scale assessing worst month psychological distress is a better predictor of suicide attempt in the past year than the scale assessing past month in all 3 samples.



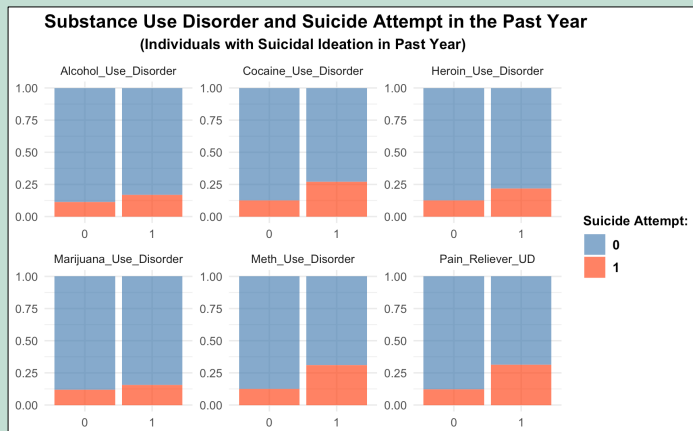
Substance Use Disorders and Relationship with Suicidal Ideation in the Past Year (n = 47,291)

Respondents with substance use disorders are more likely to report having suicidal ideation in the past year than individuals with no SUDs.



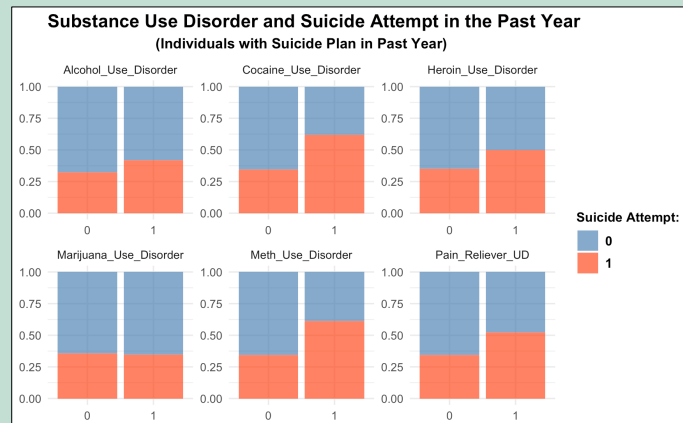
Substance Use Disorders and Relationship with Suicide Attempt in the Past Year (n = 47,291)

The differences in having an SUD is less robust when analyzing suicide attempt in the past year as the outcome.



Substance Use Disorders and Relationship with Suicide Attempt in the Past Year Among Individuals with Suicidal Ideation in the Past Year (n = 3,177)

This the same analysis but just looking at respondents who reported suicidal ideation in the past year. Individuals in this subsample with substance use disorders are more likely to have attempted suicide in the past year than individuals without a substance use disorder (having Methamphetamine Use Disorder, Cocaine Use Disorder, and Pain Reliever Use Disorder are greater risk factors than having Alcohol Use Disorder, Marijuana Use Disorder, and Heroin Use Disorder).



Substance Use Disorders and Relationship with Suicide Attempt in the Past Year Among Individuals with a Suicide Plan in the Past Year (n = 972)

This is the same analysis but just looking at respondents who reported having a suicide plan in the past year. Individuals in this subsample with substance use disorders are more likely to have attempted suicide in the past year than individuals without a substance use disorder (with the exception of Marijuana Use Disorder).

Logistic Regression: Suicide Attempt among Individuals with a Suicide Plan* in the Past Year

Predictor	Odds Ratio	95% C.I.	β	p
Alcohol Use Disorder	1.47	1.04 — 2.07	0.39	<.05
Marijuana Use Disorder	0.71	0.49 — 1.01	-0.34	.06
Cocaine Use Disorder	1.60	0.63 — 4.14	0.47	0.32
Heroin Use Disorder	0.63	0.13 — 2.88	-0.46	0.55
Methamphetamine Use Disorder	2.64	1.06 — 6.97	0.97	<.05
Pain Reliever Use Disorder	2.56	1.15 — 5.87	0.94	<.05
Psychological Distress (Worst Month)	1.07	1.03 — 1.11	0.07	<.001

*Sample of respondents with a suicide plan includes 343 respondents that attempted suicide in the past year and 620 respondents that did not attempt suicide in the past year.

Given the findings from visualizing data and statistical tests I ran (can be found in the rmd file), I decided to conduct a logistic regression with substance use disorders and the scale assessing psychological distress during the worst month in the past year as predictors of whether a respondent reported a suicide attempt in the past year among individuals who reported having a suicide plan in the past year.

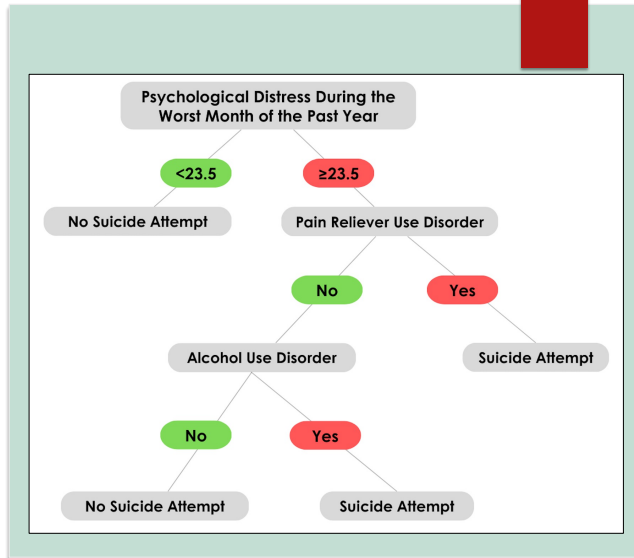
The logistic regression analysis reveals associations between specific substance use disorders and psychological distress scores with a heightened risk of suicide attempts among individuals who reported having a suicide plan in the past year.

Individuals diagnosed with alcohol use disorder, methamphetamine use disorder, and pain reliever use disorder demonstrated a statistically significant increase in the likelihood of reporting a suicide attempt in the past year, when compared to those without these substance use disorders.

Additionally, higher scores on the psychological distress measure emerged as the most robust predictor.

Decision Tree Analysis

- The most important feature in the data set is the score that indicates psychological distress during the worst month of the past year (24 is the max score)
- Having a max "Psych Distress" score and Pain Reliever Use Disorder leads to a greater chance of having had a suicide attempt
- No Pain Reliever UD further leads to Alcohol UD where if you have Alcohol UD you are more likely to have had a suicide attempt than if you did not



(The Decision Tree graphic was created on Canva)

Implications

- ▶ These findings underscore the importance of recognizing and addressing the intersectionality of substance use disorders and psychological distress in assessing suicide risk, particularly in individuals who have previously formulated a suicide plan.
- ▶ The identification of these specific risk factors allows for more targeted interventions and support strategies to mitigate the risk of suicide attempts among those with a recent history of a suicide plan.

Clinical and Public Health Considerations:

- ▶ Healthcare providers and mental health professionals should be vigilant in assessing and addressing alcohol and substance use disorders, as well as elevated psychological distress, in individuals with a recent history of suicide planning, as these factors may significantly contribute to the likelihood of a suicide attempt.
- ▶ Public health initiatives aimed at suicide prevention may benefit from incorporating targeted interventions for individuals with co-occurring substance use disorders and elevated psychological distress, tailoring support services to address the specific needs of this at-risk population.