

DEFENDING AGAINST A PANDEMIC - THE FIGHT FOR **SURVIVAL**

Pandemic Defence Coalition

Sanskar Sehgal, Vivek Golani, Nikhil Desha, Akhilesh Boppana



MOTIVATION



SUBSTANCE ABUSE

Surge in Pandemic Substance Abuse Evidence



PREPAREDNESS FORECASTING

1-Week Lead Time:
Enhancing Pandemic Preparedness



MENTAL HEALTH

Quantifying Pandemic's Mental Health Impact



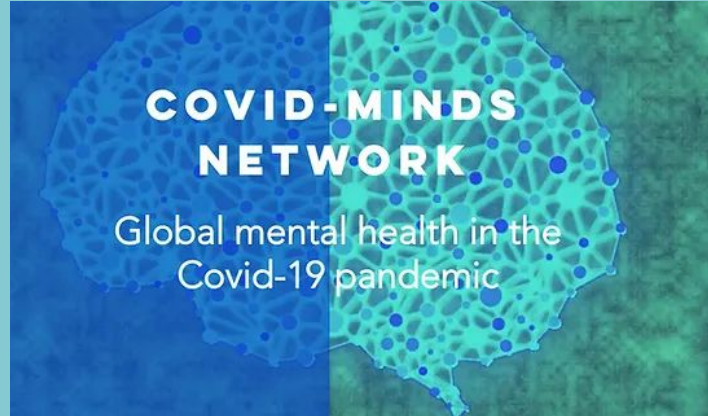
FINANCIAL SUCCESS

Bill Gates Million-Dollar Funding

BACKGROUND

COVID-19 pandemic: The fears and hopes for SDG3

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9334993/>



Data on the prevalence of mental disorders and availability of mental health services

<https://www.who.int/data/gho>

Research on impact of quarantine and social isolation, the impact on vulnerable populations, and the effectiveness of different interventions.

<https://www.covidminds.org/>

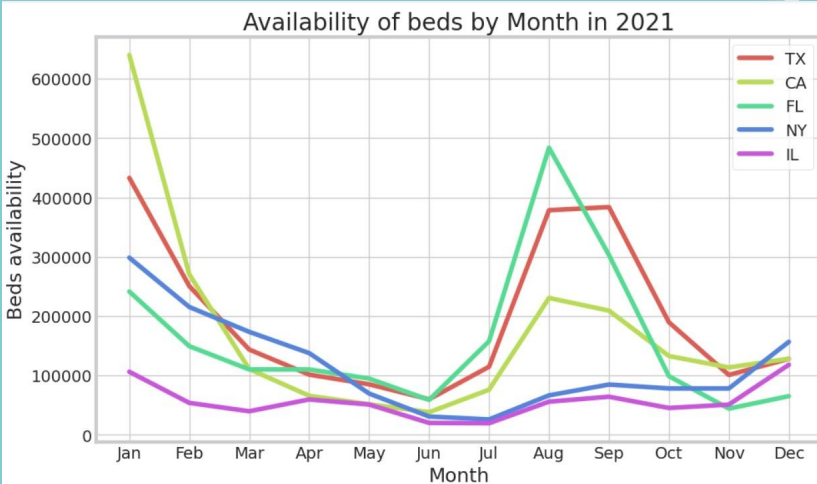
Mental health during the COVID-19 pandemic:

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0277562>

DATA



	ID	Title	Post Text	Score	Created On	critical	major	moderate	minor	cosmetic
0	f7fjrs	50 Years Sober Today.	Today is the 50th anniversary of my sobriety. I...	536	2020-03-29 19:17:49	0.212486	0.201722	0.167386	0.20874	0.209668
1	jxen6i	4 years sober today	My battle has been a long one and I'm only 29....	462	2020-11-19 19:15:04	0.201888	0.193704	0.200384	0.196753	0.207271
2	8e48gp	One day at a time.	NaN	440	2018-04-22 12:15:36	0.226554	0.13789	0.201599	0.196287	0.23767
3	iu94bn	Today is 38yrs sober!	**Thank you very much for the warm wishes, eve...	322	2020-09-16 21:06:05	0.22199	0.198205	0.189143	0.198741	0.19192
4	8u44pm	Big night for me	NaN	319	2018-06-26 18:00:27	0.229374	0.168526	0.209455	0.171327	0.221318



1

REDDIT COVID DATASET

14.62GB (Kaggle) with 17 million rows and 11 columns

2

UNITED STATES COVID-19 CASES

Covid cases in USA by week (5MB)

3

REDDIT SCRAPED DATA

3.02 GB (scraped) contains 13050 rows and 11 columns

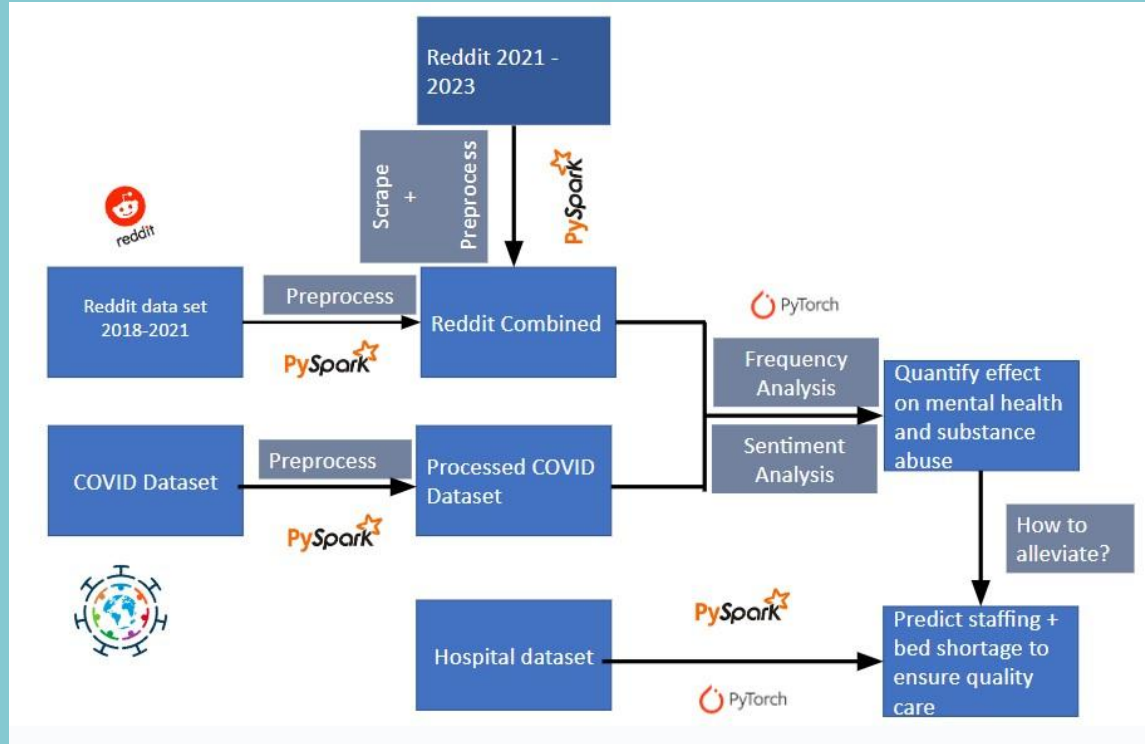
4

HOSPITAL DATA

Reported Patients & Hospital Capacity (50MB containing 135 columns and 75000+ records)

METHODOLOGIES

**SENTIMENTAL
ANALYSIS**



**PEARSON'S
CORRELATION**

**FREQUENCY
ANALYSIS**

**TIME
SERIES
ANALYSIS**

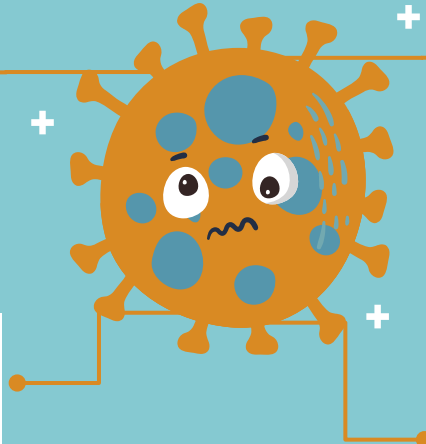
SENTIMENT ANALYSIS

EXPERIMENT

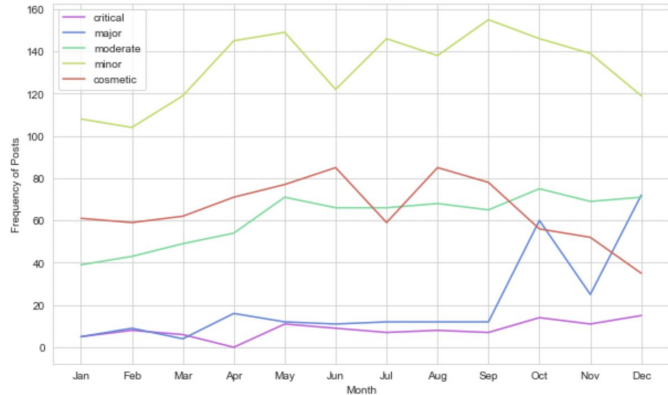
Analyzed Reddit posts pre and during Covid 19, classifying them based on severity.

STUDY

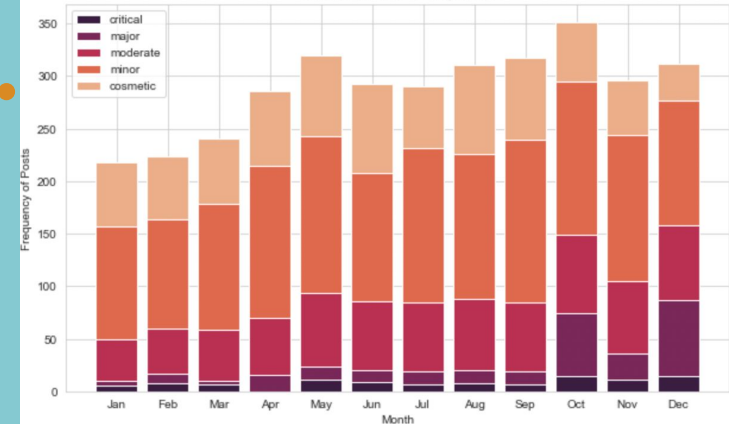
We aim to investigate the correlation between severity of posts and prevalence of covid cases.



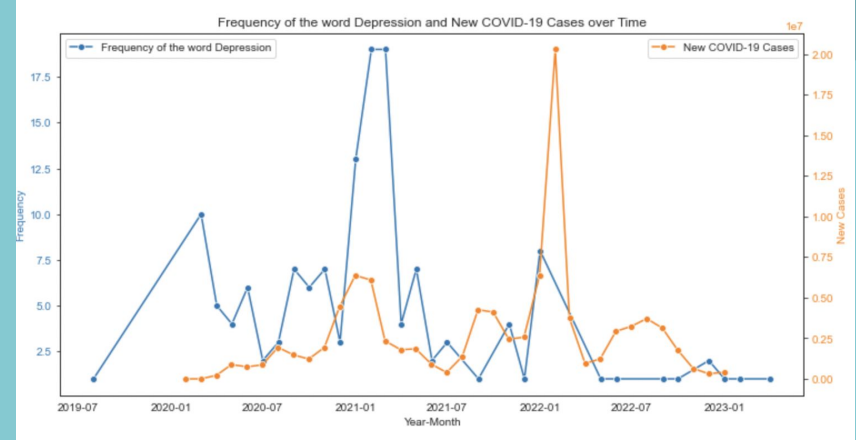
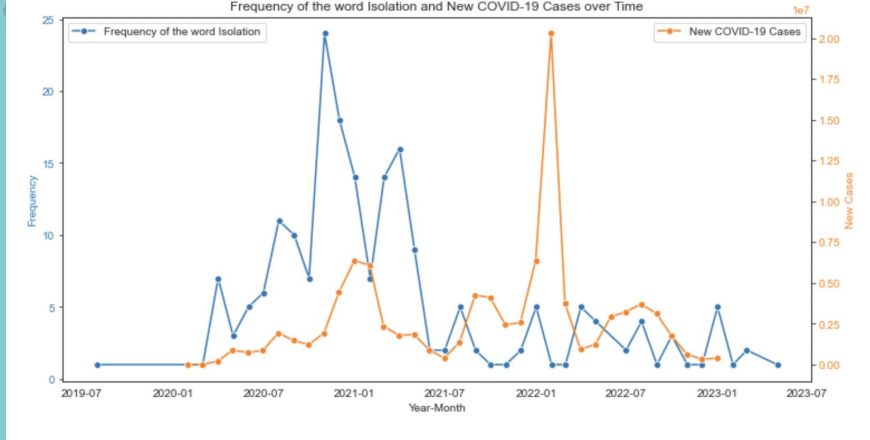
Substance Abuse Severity by Month in 2020



Substance Abuse severity in 2020



FREQUENCY ANALYSIS



ISOLATION



EXPERIMENT

We analyzed Reddit posts before and during COVID-19 to identify any trends in the usage of specific keywords.



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DEPRESSION



STUDY

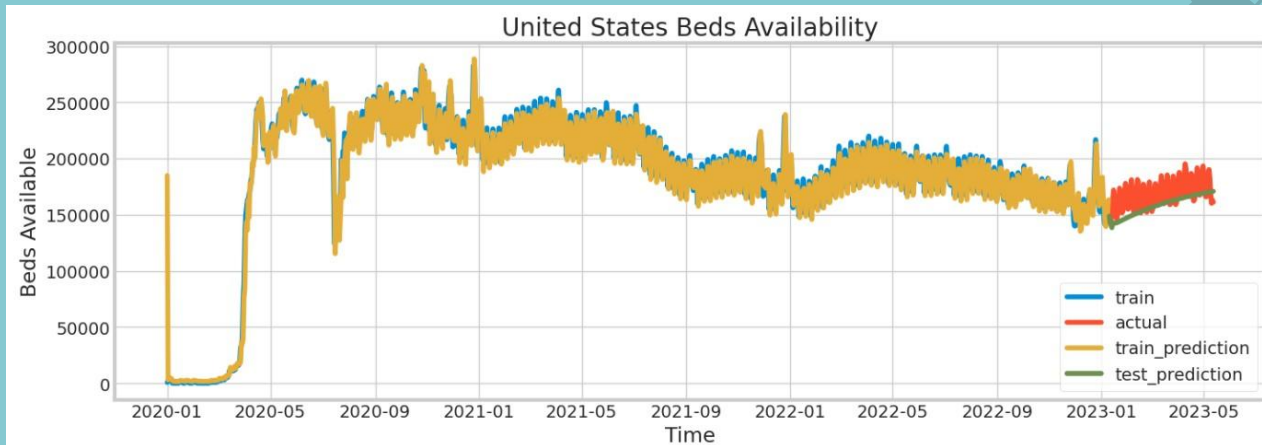
We aim to study the frequency of key words such as "Isolation", "Depression", "Weed", etc pre and during covid.

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TIME SERIES ANALYSIS

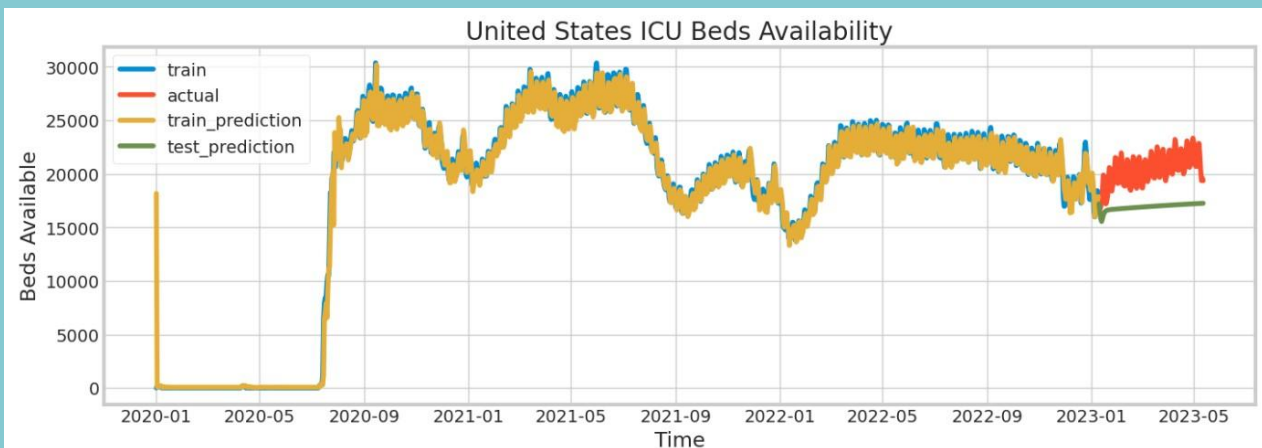
Employed ARIMA model to forecast inpatient and ICU bed availability for United States

01

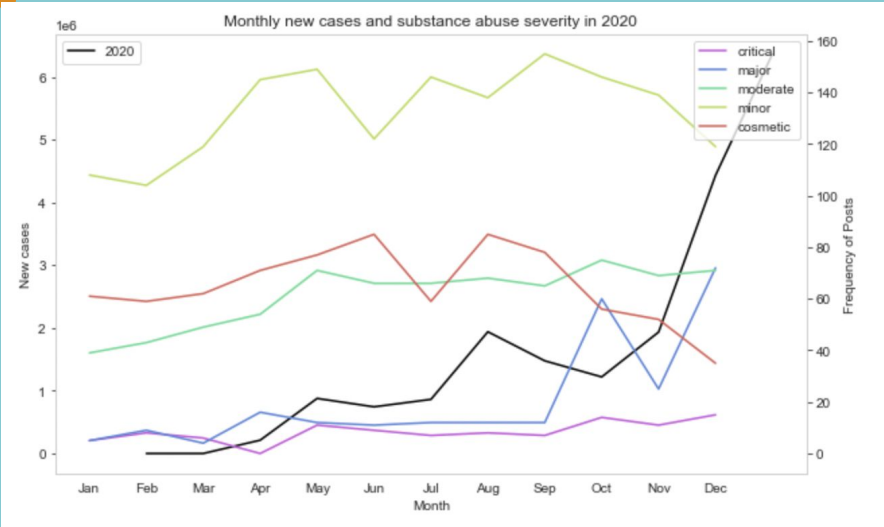


Analysis was also performed for the NY state using 90% data for training.

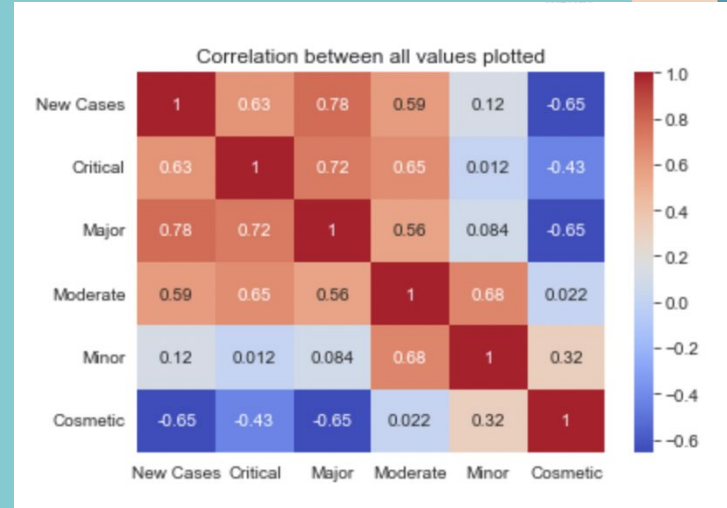
02



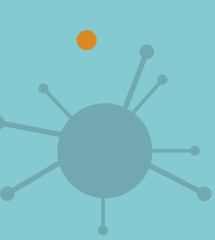
SENTIMENT ANALYSIS RESULTS



Line graph illustrating the severity of Reddit posts and the number of COVID-19 cases.



Heatmap displaying the correlation between the severity of Reddit posts and the number of COVID-19 cases.



TIME SERIES RESULTS

	USA				New York State			
WEEK	Predicted Beds	Actual Beds	Predicted ICU Beds	Actual ICU Beds	Predicted Beds	Actual Beds	Predicted ICU Beds	Actual ICU Beds
1	1,172,751	1,216,311	120,067	148,897	76,618	66,647	9913	8509
2	1,180,763	1,246,315	120,288	152,209	76,735	69,773	10015	8758
3	1,188,247	1,234,436	120,502	151,322	76,829	70,808	10109	8804
4	853,055	835,176	86,200	100,660	54,925	46,344	7274	5587
Average Error	-65,989		-50,000		+8251		+809	





CONCLUSIONS

Correlation Analysis

Established a strong correlation between the rise in COVID-19 cases and the frequency of critical, major, and moderate posts

Analytics for Healthcare

Showcased effectiveness of analytical techniques in healthcare decision-making, highlighting the value of data-driven approaches in improving healthcare outcomes.

Contribution to UN Goal 3

By addressing mental health, bed availability and substance abuse during pandemics, we contribute to the broader mission of achieving this goal.

REFERENCES

1. Impact of covid on mental health: <https://www.covidminds.org/>
2. WHO Data: <https://www.who.int/data/gho>
3. Mental health during the COVID-19 pandemic:
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0277562>
4. XLNET paper: <https://arxiv.org/abs/1906.08237>
5. Dataset: <https://www.kaggle.com/datasets/pavellexyr/the-reddit-covid-dataset>
6. Dataset: COVID-19 Reported Patient Impact and Hospital Capacity
7. Dataset: Covid Prevalence in the US
8. ARIMA Model used :
https://www.researchgate.net/publication/328633706_Forecasting_of_demand_using_ARIMA_model
9. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9334993/>