

Online Diabetes Discourse

Exploring Sentiment in Diabetes Social Media Posts



Public Health Impact

Diabetes worldwide 10.5%
(463 million)

Social Media Usage
Worldwide 59.6%
(4.8 billion)



Types of Diabetes

Type 1

- An autoimmune disease
- Requires insulin to live
- Not preventable, but some research shows that avoiding exposure to viruses can help reduce your risk
- Regular vaccinations and wellness visits are important



verywell

Type 2

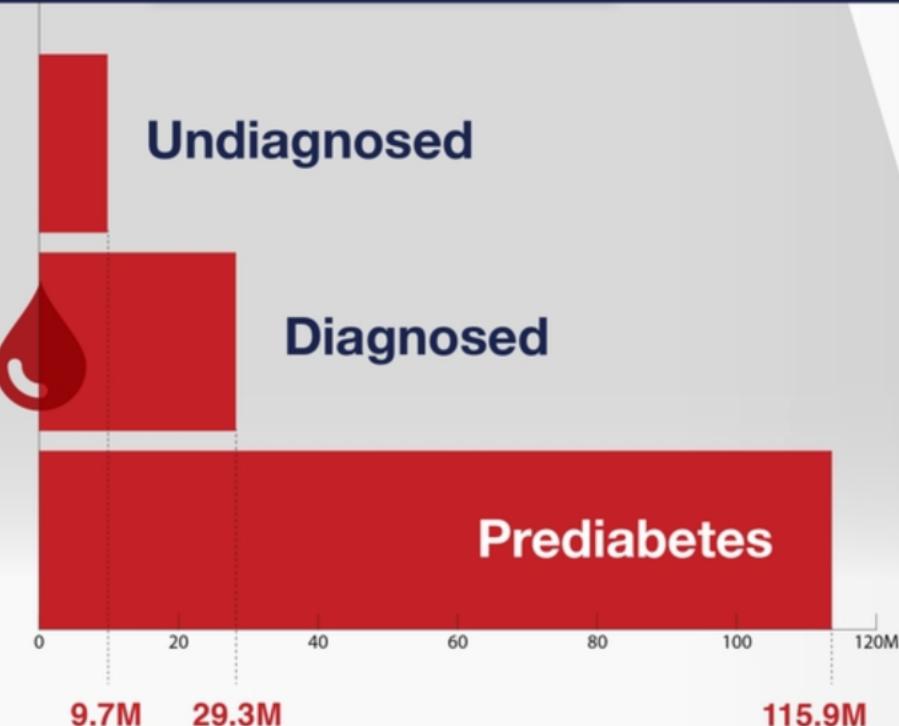
- Insulin resistance can lead to elevated blood sugars
- Many people that have type 2 suffer from underlying health problems
- Can be prevented by eating healthy and staying active



Gestational

- Occurs during pregnancy
- Caused by a combination of genetic and environmental risk factors
- Blood sugar typically returns to normal after birth





Heart Disease & Stroke Statistics 2024 Update

9.7 million
adults have undiagnosed diabetes

29.3 million
adults have diagnosed diabetes

115.9 million
adults have prediabetes

(based on 2017-2020 data)

Working at the Intersection of Health and Social Media

Potential for Industries to:

1. Monitor Real-time Data
2. Learn Patient Perspective
3. Thematic Analysis
4. ID Concerns & Issues
5. Engage Audiences



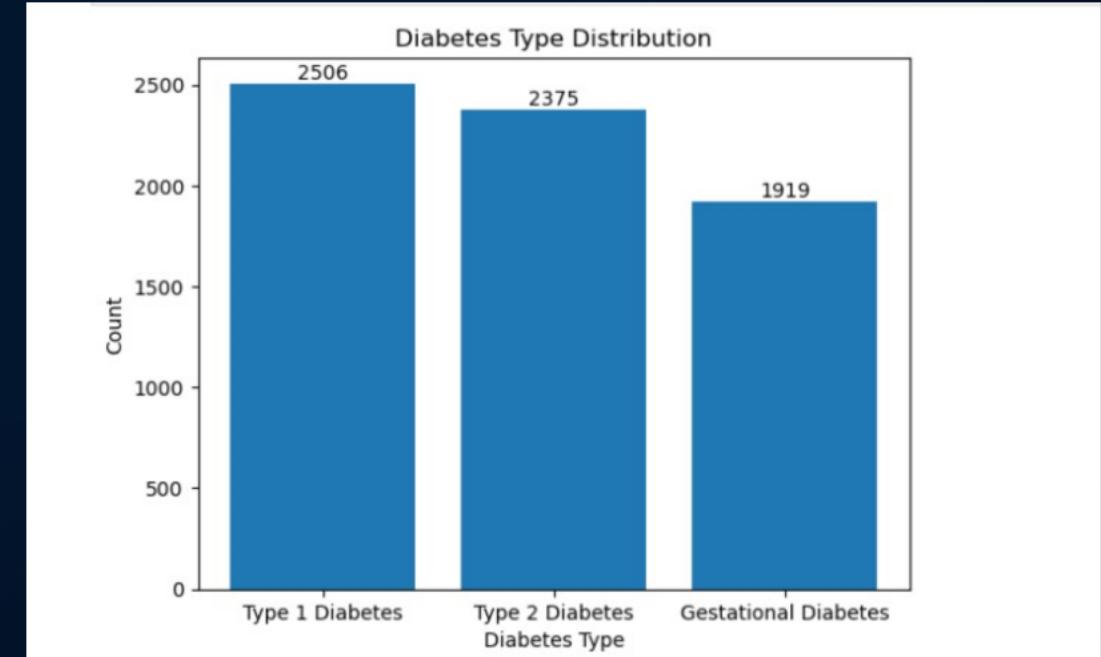
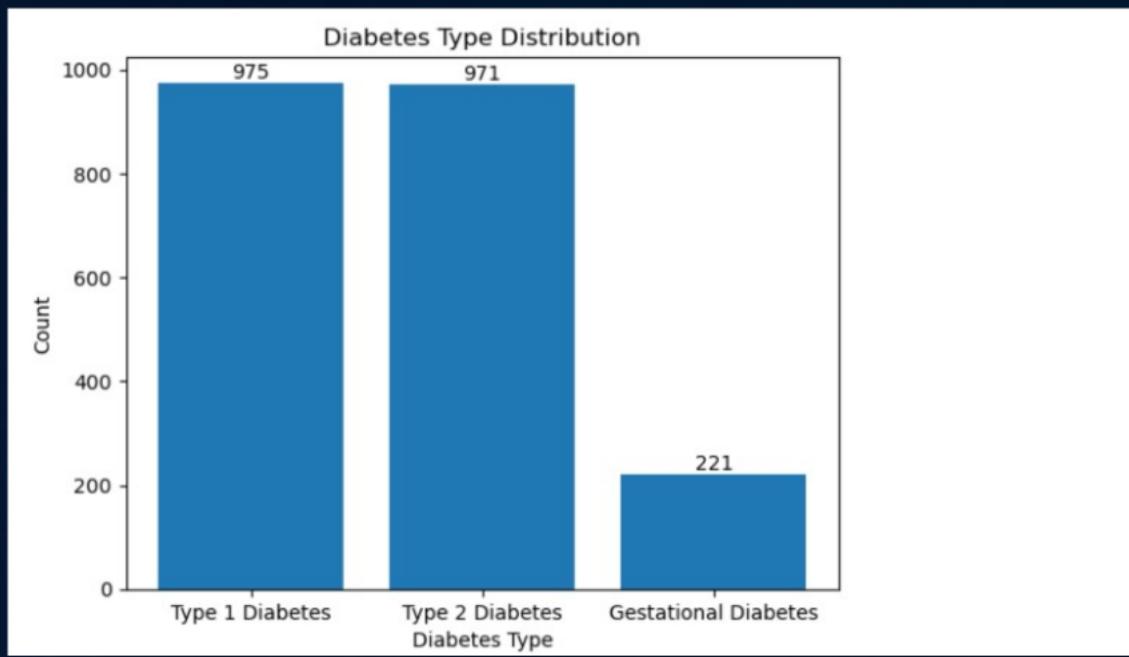
Technological Analysis



- What data are we using? ~60,000 posts from various platforms such as Facebook, Twitter/X, (Non-Reddit platforms) and Reddit. Large volumes of data means a lot of cleaning!
- Using Python and R programming languages, we utilized NLP algorithms like VADER, Text Blob, and Sklearn libraries to analyze emotional sentiment in social media posts.
- The how: frequency distribution charts for keywords, word clouds, Term Frequency-Inverse Document Frequency (TF-IDF), Named Entity Recognition (NER), VADER and CoreNLP algorithm pipelines.

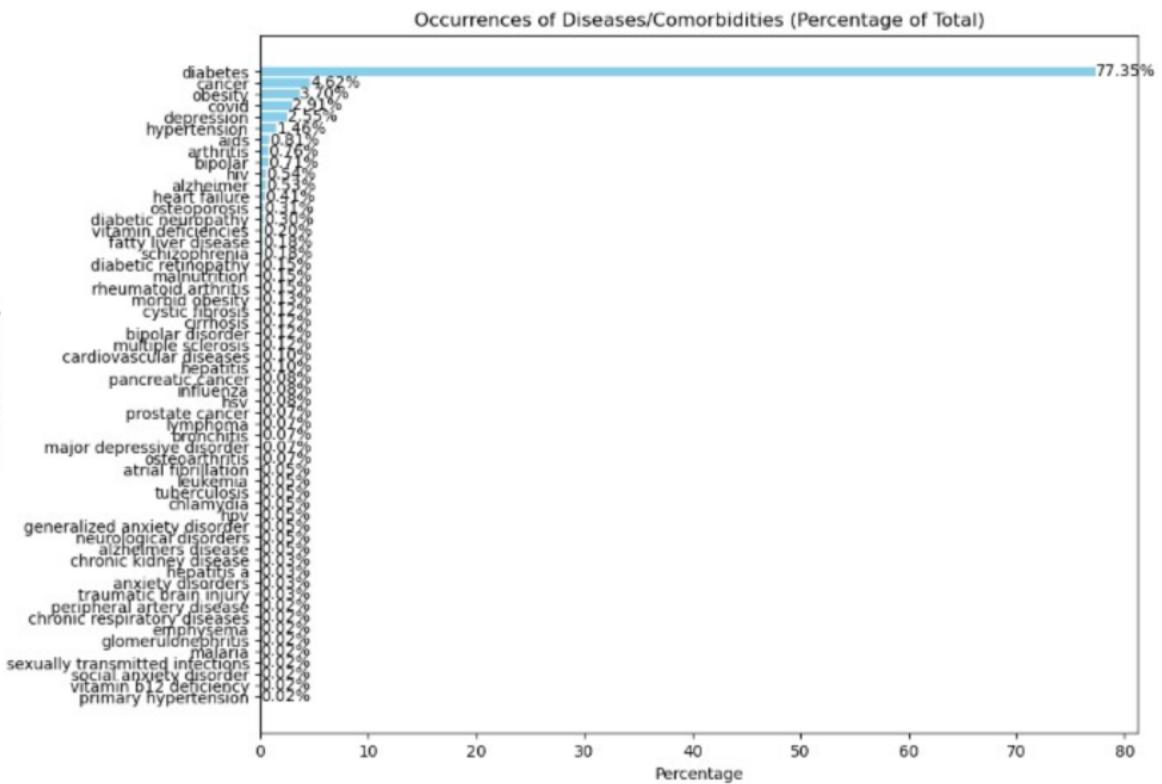


Distribution of Diabetes

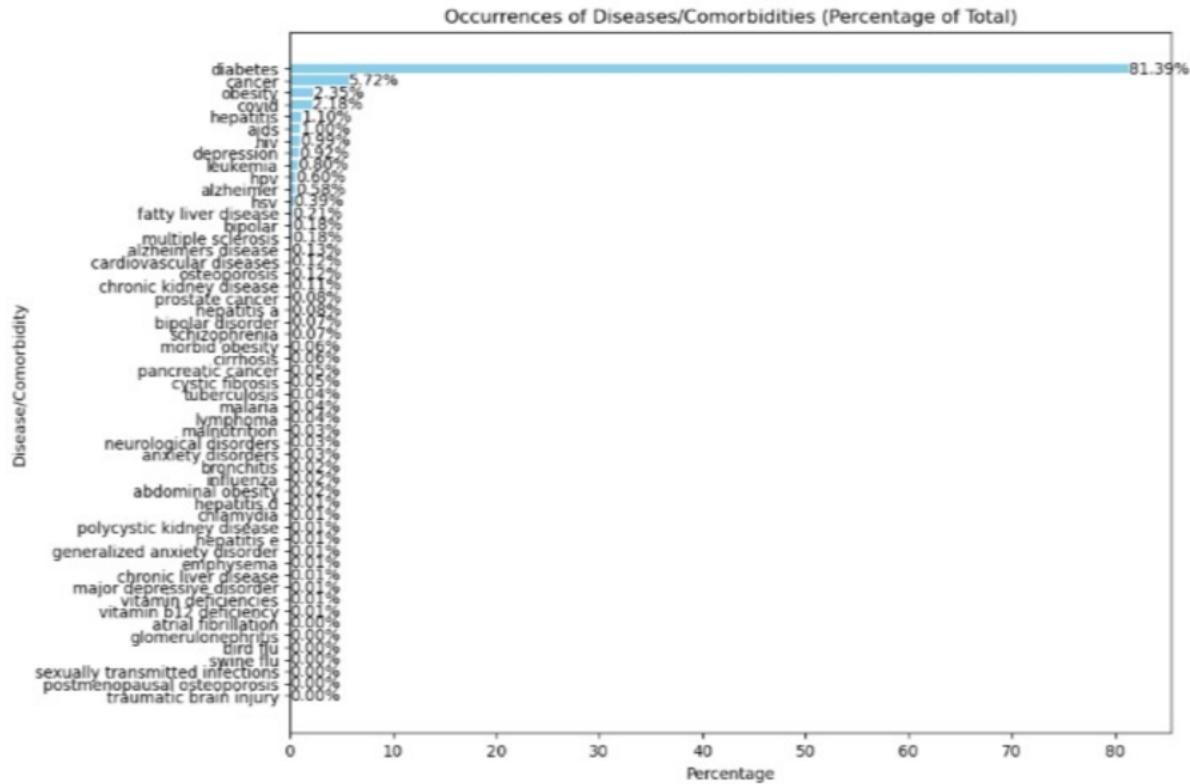


Diseases and Comorbidities

Disease/Comorbidity

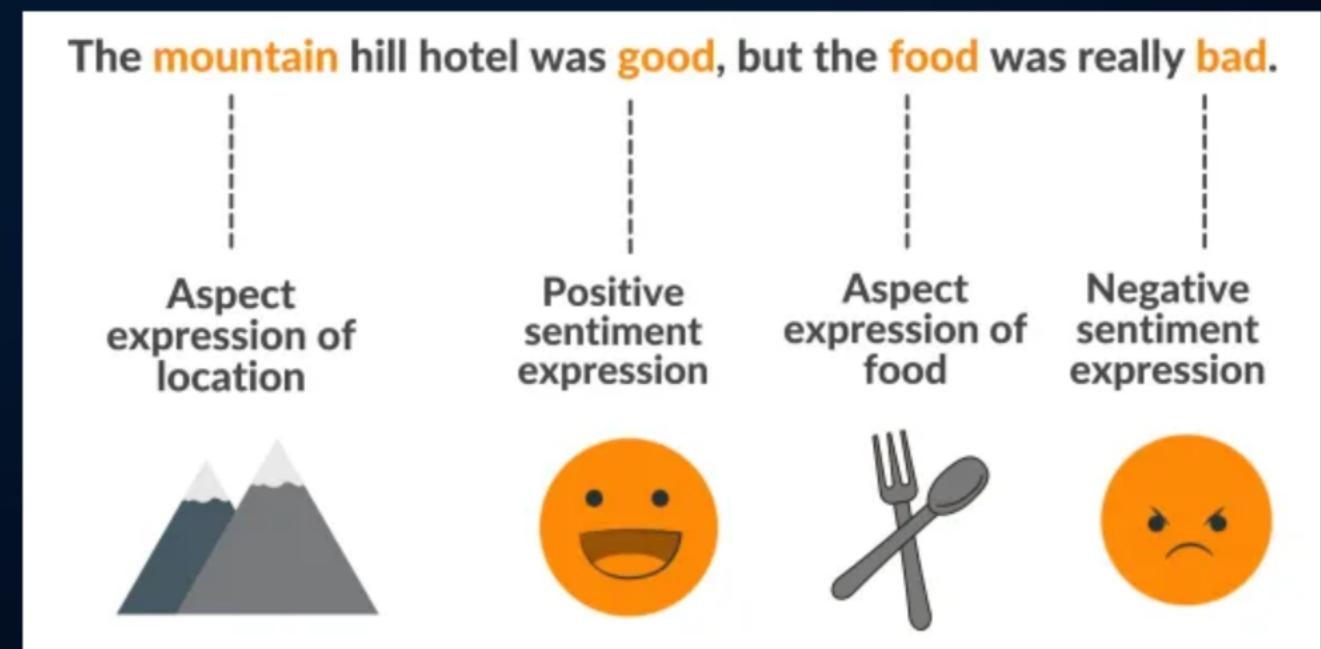


Disease/Comorbidity

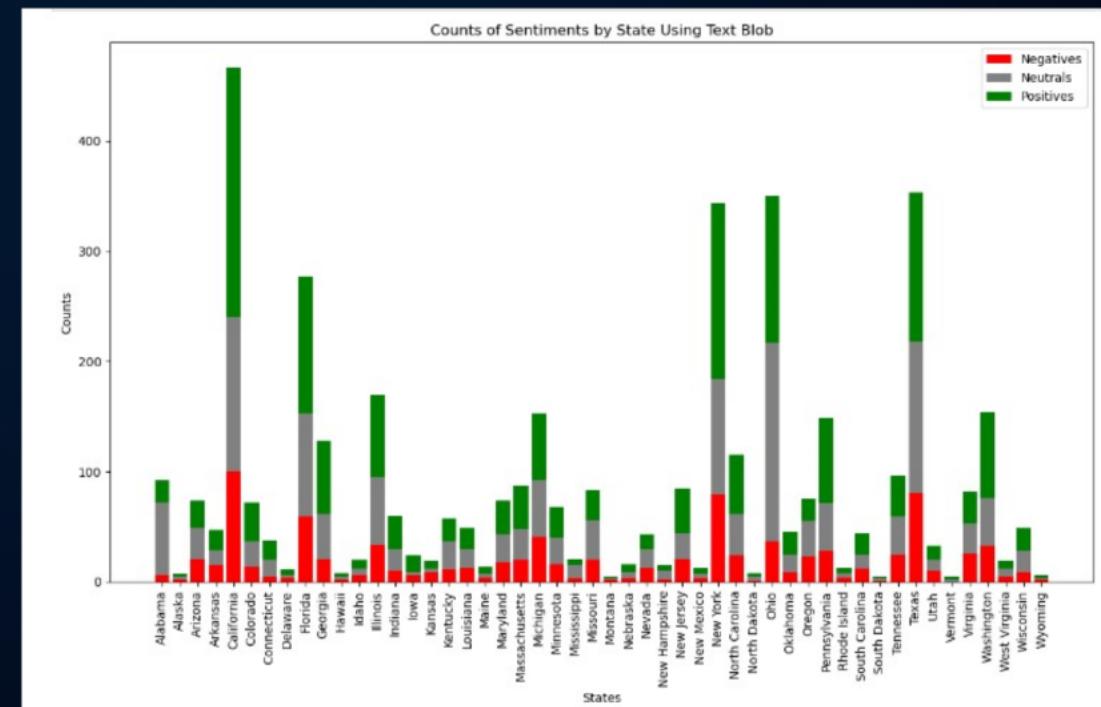
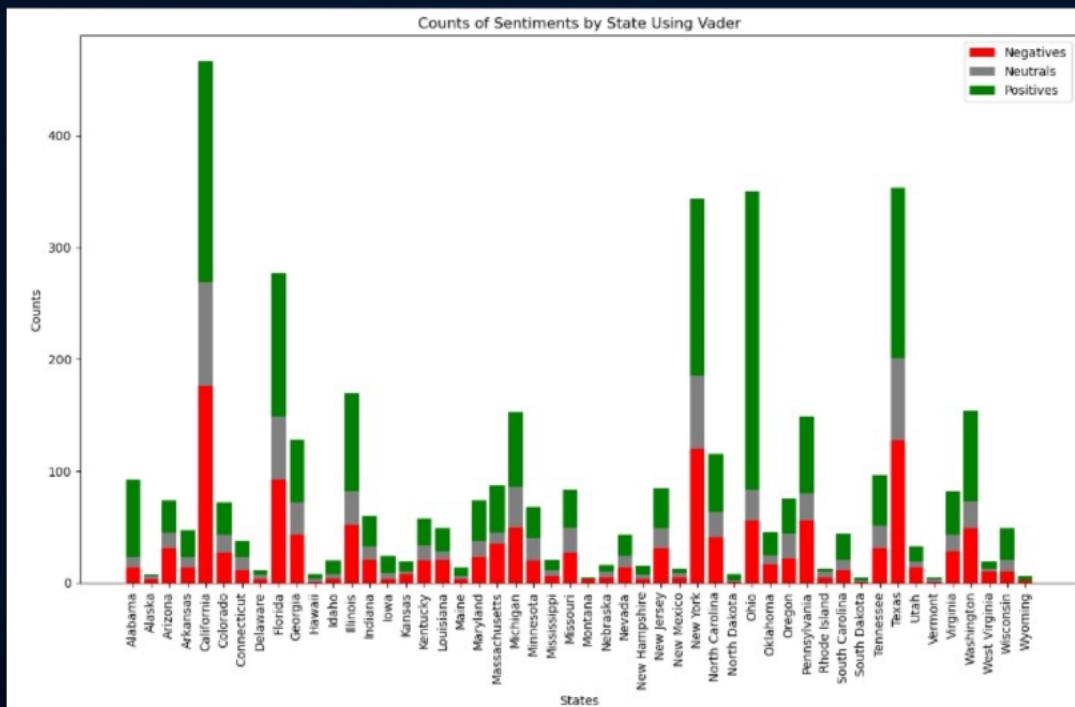


Aspect Based Sentiment Analysis

- What is Aspect Based Sentiment Analysis (ABSA)?
- Importance of ABSA?
- Challenges of ABSA?



Sentiment Based on Location



Highlights: Diet and natural remedies for managing blood sugar levels, including karela (bitter melon), moringa, and jamun.

Top words for each topic:

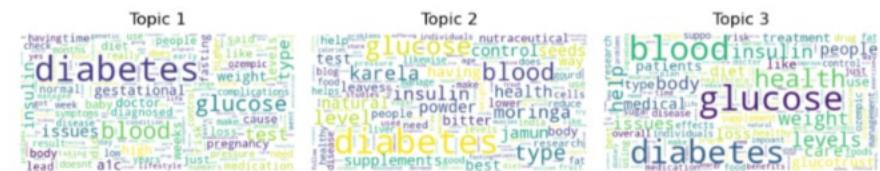
Topic #1:
diabetes blood glucose test type issues insulin gestational weight a1c

Topic #2:
diabetes glucose blood type karela level insulin moringa jamun control

Topic #3:
glucose blood diabetes health levels insulin weight help body issues

Topic #4:
diabetes like just blood glucose know type did eat people

Topic #5:
diabetes skin healing protein sugar use favorite cream make love



Top words for each topic:

Topic #1:
eat carbs like diabetes food sugar just diet eating protein

Topic #2:
like blood just glucose time dont need low think sugar

Topic #3:
blood diabetes insulin weight glucose health body levels high loss

Topic #4:
diabetes people just like type know insurance life dont think

Topic #5:
glucose just test blood insulin a1c time day like years



Topic Modeling

Topic modeling is a type of statistical model that uses unsupervised ML to identify clusters or groups of similar words within a body of text.

Term Frequency-Inverse Document Frequency (TF-IDF)

IDF values:

```
a1c : 3.709498427278575
abnormality : 8.973224349056991
diabetes : 2.1545188869083667
disease : 4.272743983264576
glucose : 2.7132605489140036
insulin : 3.080475774888168
monitor : 4.532928806259135
prediabetes : 5.458698282087834
prescription : 5.202764907950633
steroids : 6.798472627572832
sugar : 3.711570966880547
```

A sample of words from each post from the Reddit dataset that had relevance to the sentiment score of each post.

The main idea:
The **higher** the score, the **more relevance**/contribution it has towards the sentiment score.

About Us!



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