




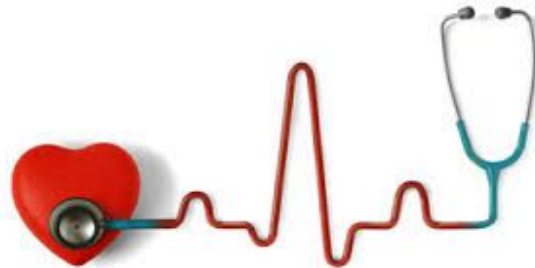
Patient Experience Twitter Data Analysis

Allison Byron & Asha Mehrer

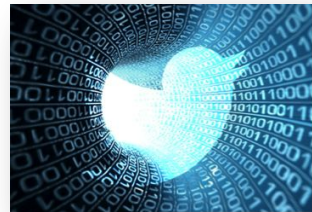


Background - Why focus on patient experience tweets?

- Hospitals incentivized to provide quality
- Identify measures to improve patient care
- Discover issues important to patients
- Analyze new technology & products in the industry



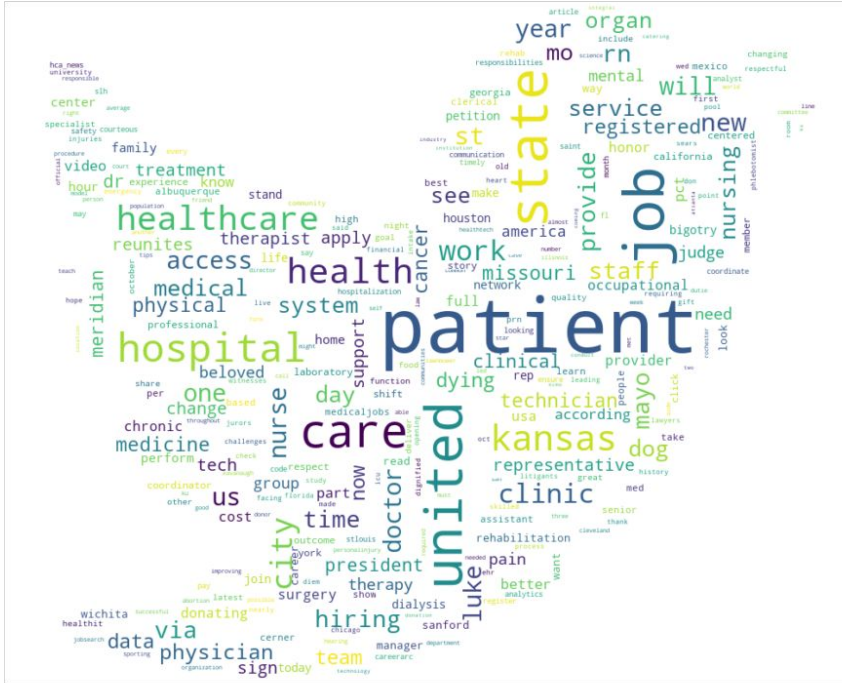
Data Overview / Analysis Preparation



- 1 week of 483 tweets mentioning major US hospitals and 'patient'
- Cleaning of tweet text
 - Removed common words to keep only meaningful context
 - ex: "a", "hospital", "healthcare", "united states", etc.
 - Removed URLs, punctuation & excluded retweets
 - Emojis are present in the text but not included in analysis
- Methods of analysis used
 - Word counts
 - Sentiment & Topic extraction using sentiment dictionaries

Most Common Words

Raw Text



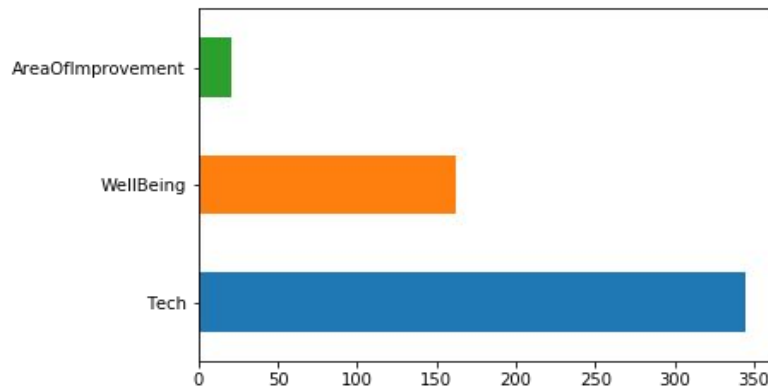
Processed Text



Topic/Label Analysis

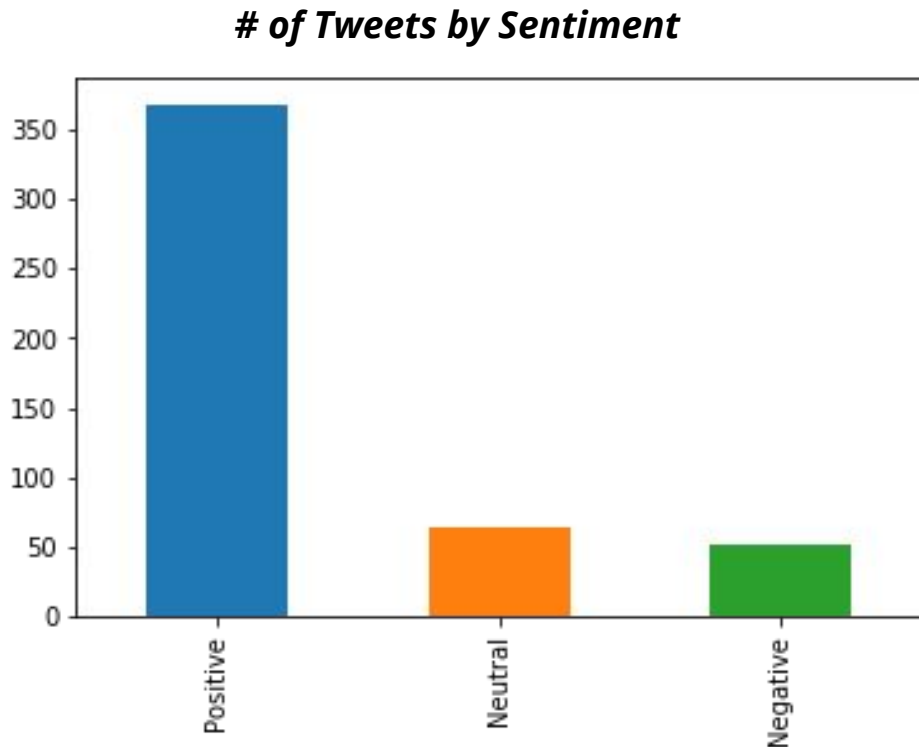
- Assigned labels/categories for tweet text using a sentiment dictionary and custom words
 - Tech/Promo - tech, legal, political
 - Wellbeing - health, physical, psychological etc
 - Area of improvement - need, try, goal
- Minimum of 2 words needed in these groups to assign a topic

Topics by # of Tweets



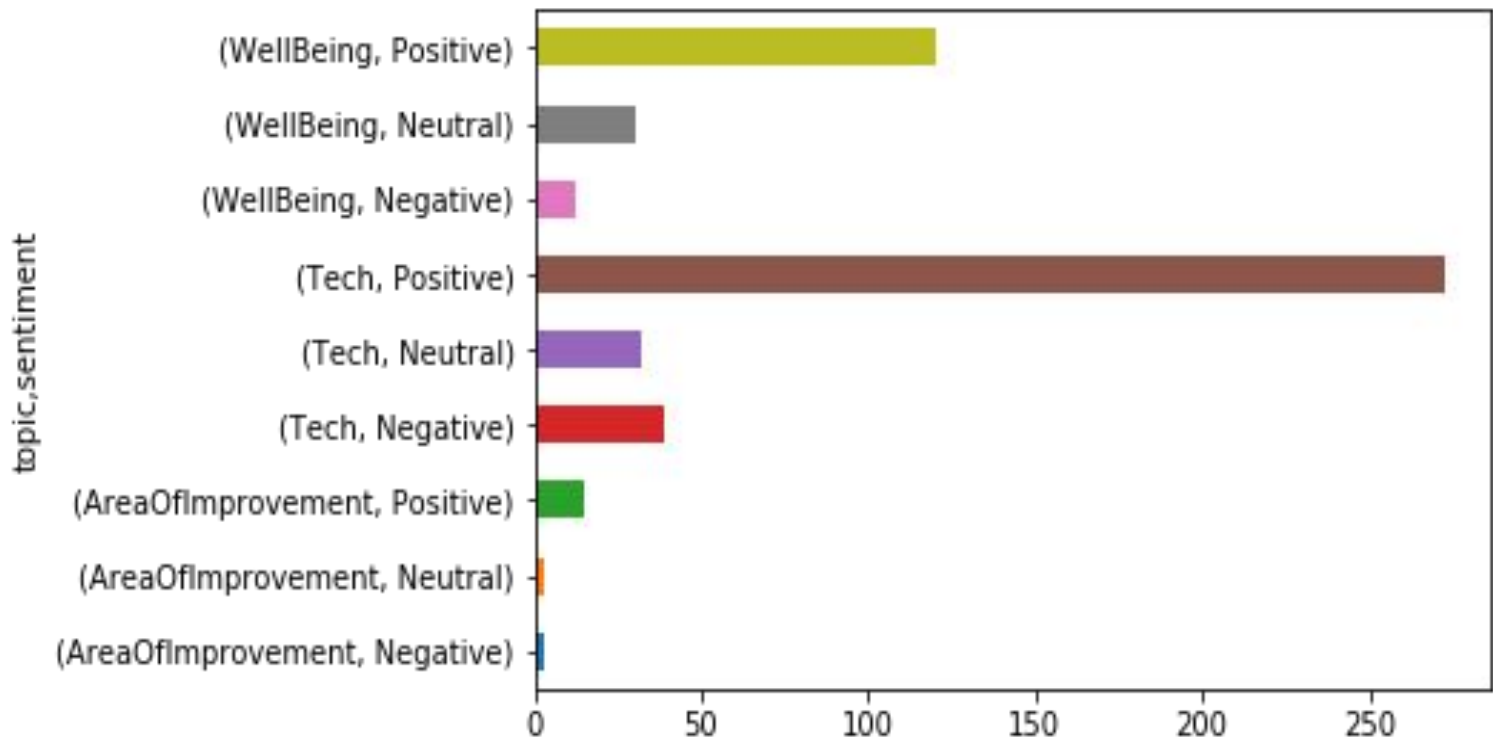
Sentiment Analysis

- Identified sentiment of tweets using a sentiment dictionary
- Nouns and pronouns considered as “Neutral” words
- Sentiment dictionary label examples:
 - affect, feelings, hostile, positive, negative, emotion, pain, feel, Yes, No, etc.



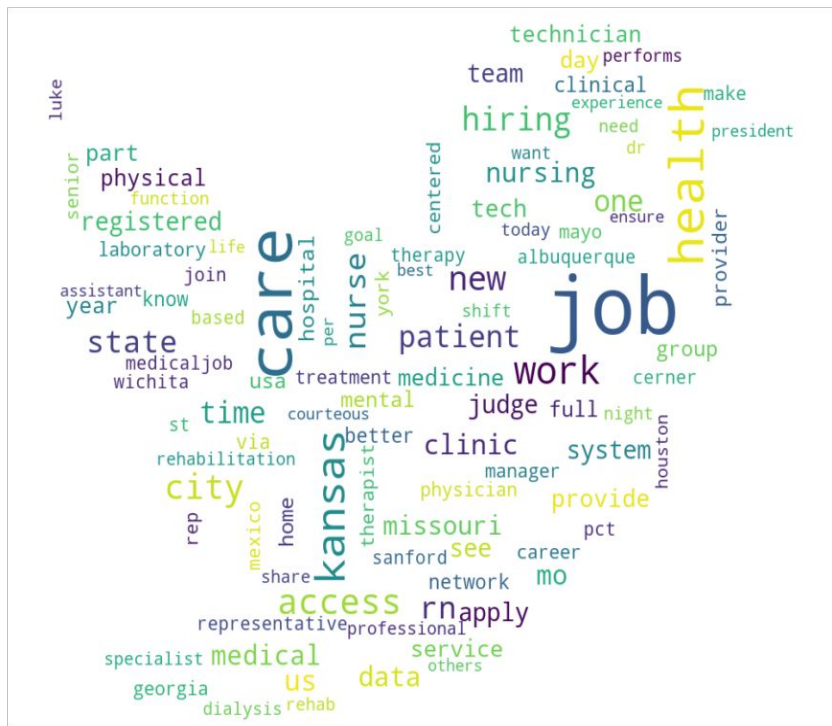
Grouping Topic and Sentiment

Majority of tweets were Tech-Positive – ex: hospitals sharing technology news, job openings, etc.

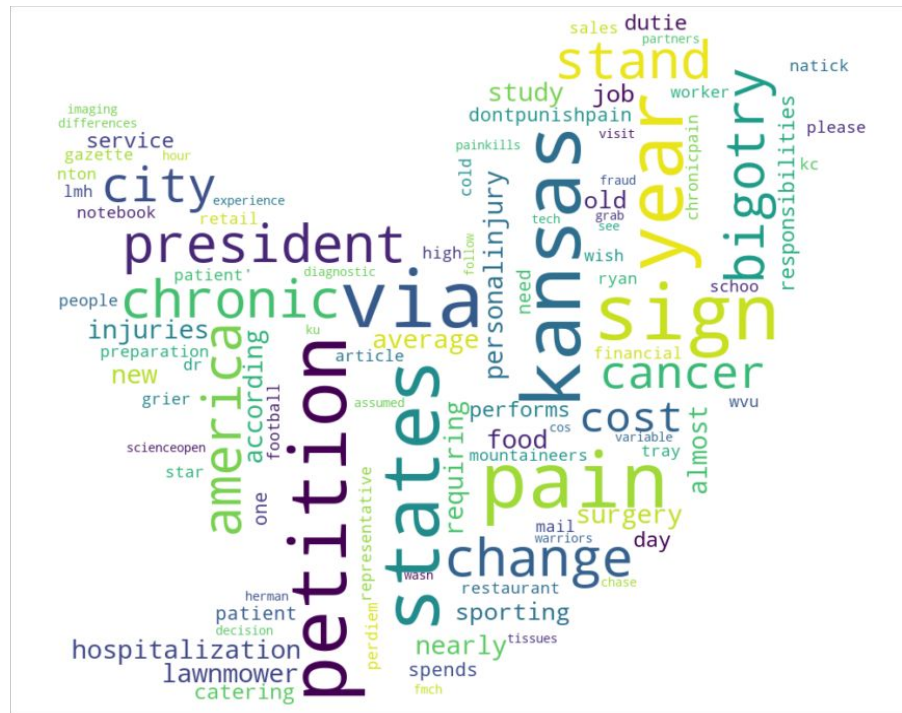


Most Common Words by Tech/promo

Positive



Negative



Most Common Words by Wellbeing

Positive

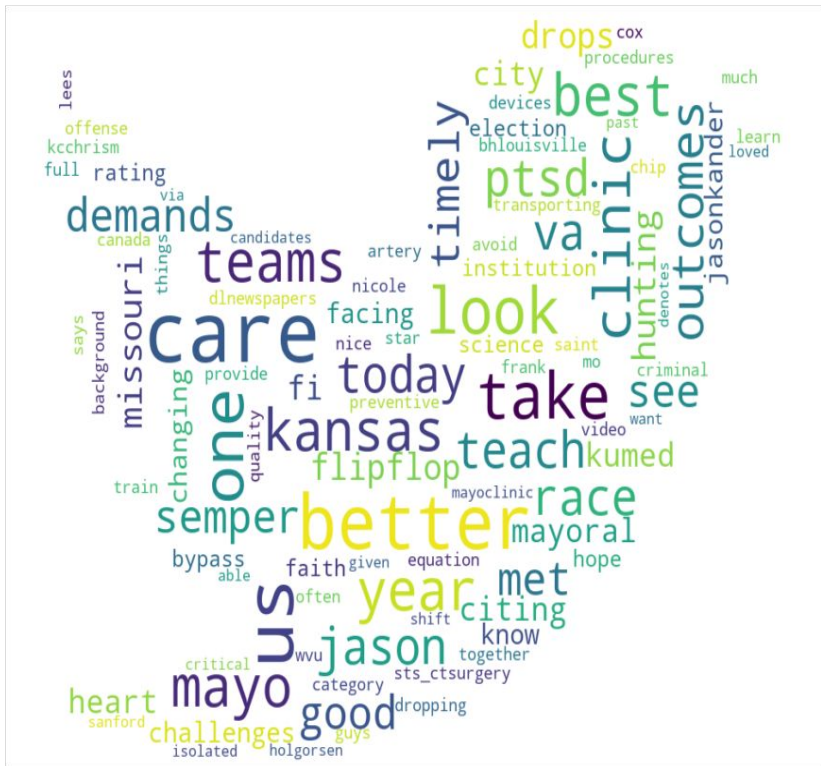


Negative

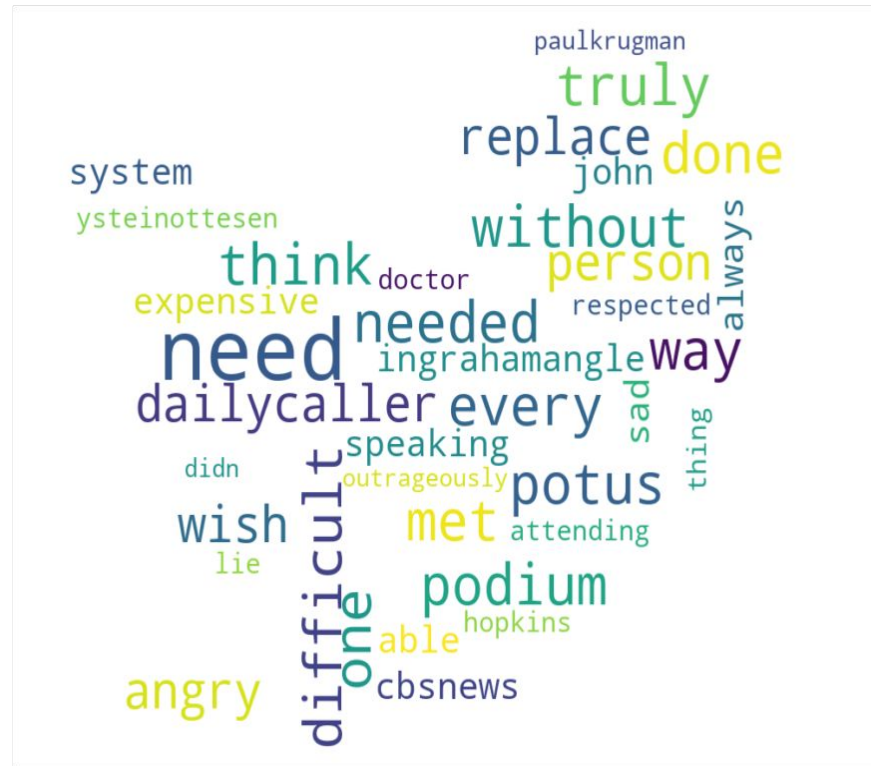


Most Common Words by Area Of Improvement

Positive



Negative



Limitations within Analysis

- Restricted to 1 week of tweets
- Accurate sentiment not captured in tweets with video / image
- Limited contextual information available in short tweet texts for sentiment analysis

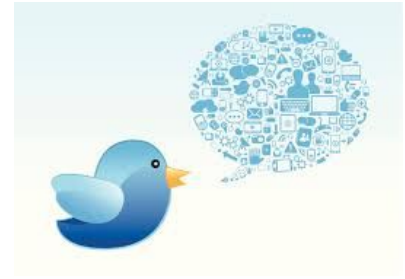


Next Steps / Future Recommendations

- Monitor tweets over time - observe and evaluate trends
- Supplement with national patient satisfaction surveys
 - Example of an external source: HCAHPS survey
 - Analyze relationship between tweet sentiments and survey data
- Continue to refine models for improved performance
 - Focus on a specific area of a health system
 - Update terms in topic analysis groups



Conclusion



- Overall summary
 - Healthcare technology is an important patient care
 - Minimal negative sentiment from patients
- Benefits
 - Ability to better serve patient populations
 - Discover patient care current events and trending topics
 - Marketing opportunities through Twitter / social media
 - Identify hashtags and topics to engage patients in conversations

Questions ?