A Methodological Approach Using Sentiment Analysis (SA) of Online Medical Forums as a Source of Real-World Data on Patient Experiences

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Online reviews of products used to treat medical conditions are a rich source of real-world data. Analyzing these data is a novel alternative to patient interviews and focus groups. The methods described here have broad application across diseases, new and emerging therapeutic areas, and for outcomes research evidence generation

WebMD.com Review

👤 KO841610 | 25-34 | Female | On medication for less than 1 month | Patient   8/4/2018

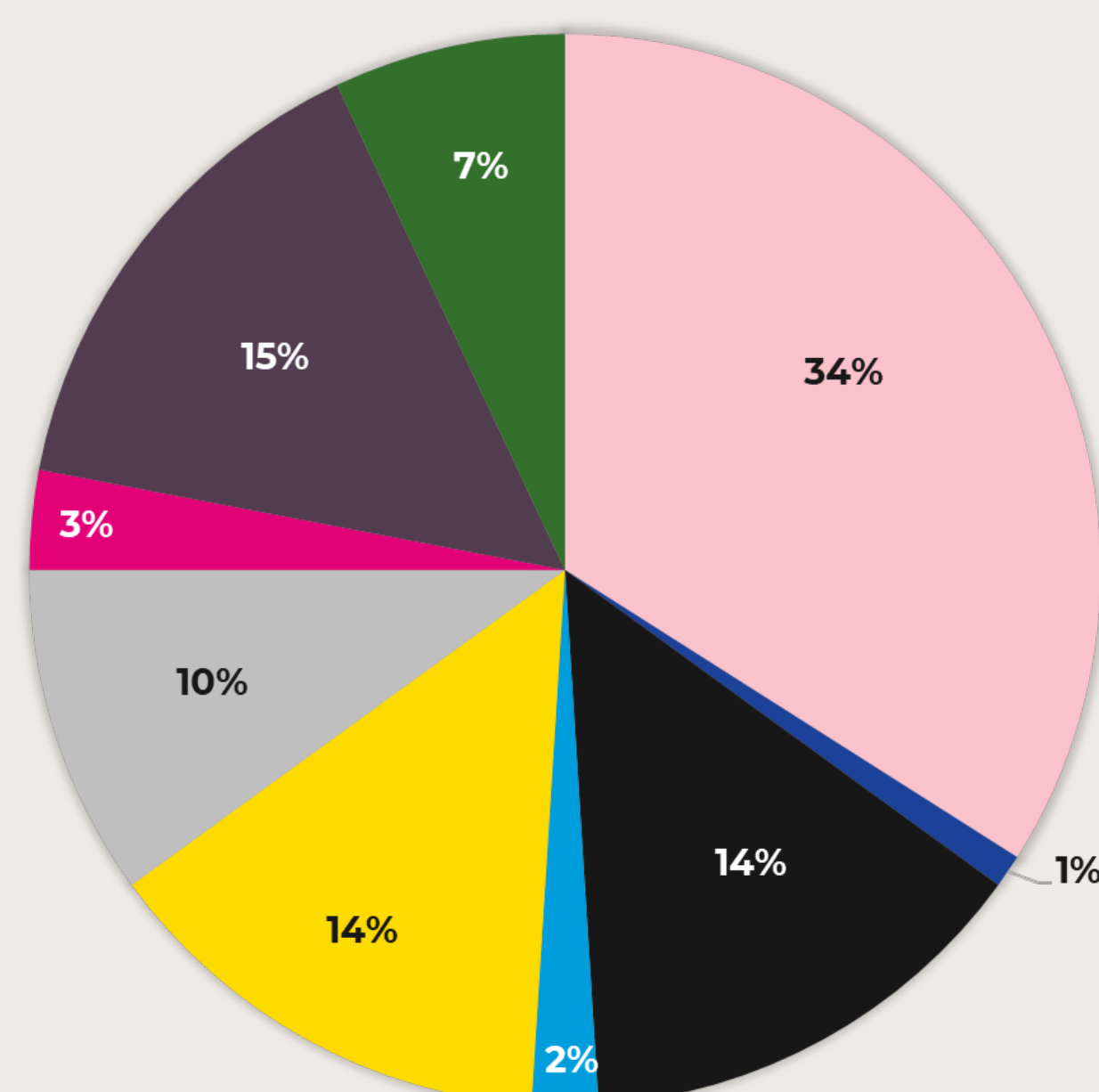**Condition: Vaginosis caused by Bacteria**

Overall rating 4.0 ★★★★☆

Effectiveness	Ease of Use	Satisfaction
★★★★☆	★★★★☆	★★★★☆

I find reviews to be helpful for people looking for real life answers like myself. Information is valuable. I had been dealing with BV for 6 long torturous months. The fishy smell was embarrassing and it would make me nauseous after while. When I got tested from my gynecologist, she told me that I was borderline BV....so they refused to give me anything. After a 2nd visit and more compliants from me because it would come back every single month after I took OTC med every month....my doctor finally prescribed me with Product A The rx was like $120 even with my insurance! Luckily, my dr gave me a coupon and it dropped the price down to around $40. I inserted the vaginal cream that same night (it's only one dose). Ever since I inserted it, I've had no more fishy smell and no more thin milky discharge....and it's been 2 months so far that I'm BV free! I'm so relieved! However, I did get a yeast infection that keeps coming back after I've tried several treatments (I tried three over-the-counter products   ). BV gone but YI is still lingering around. I'm currently trying boric acid suppositories for my reoccurring YI. I hope it works. But as far as Product A for BV, it worked for me! I'm 2 months free of BV and I was getting them every month for the last 7 months! I would recommend Product A but please beware of possible yeast infection or UTI. I hope that this information helps. **Read Less** ∧

Pharmacovigilance & Ethics
01
Data are anonymous, complicating the AE/SE reporting without explicit policies

IRB may deem as research not involving human subjects

Tokenization & Determinations
03
Word-, sentence-, and review-level tokens provide different levels of analysis

Reviews that contain multiple topics need to be parsed out to determine the topical theme (see left)

Quantitative Analyses
05
Use reviewer attributes, start ratings, and SA scores to test hypotheses

Line graphs, bar charts, and word clouds provide additional details to make product comparisons (see below)

Data Extraction & Cleaning
02
Custom web scraper can extract all text, demographics, star ratings, & dates into a relational SQL database

Clean text of cases, special characters, emojis, contractions and typos

Compare & Validate SA Packages
04
SA packages use different lexicons & scoring algorithms. Consider building a lexicon for a disease state of interest
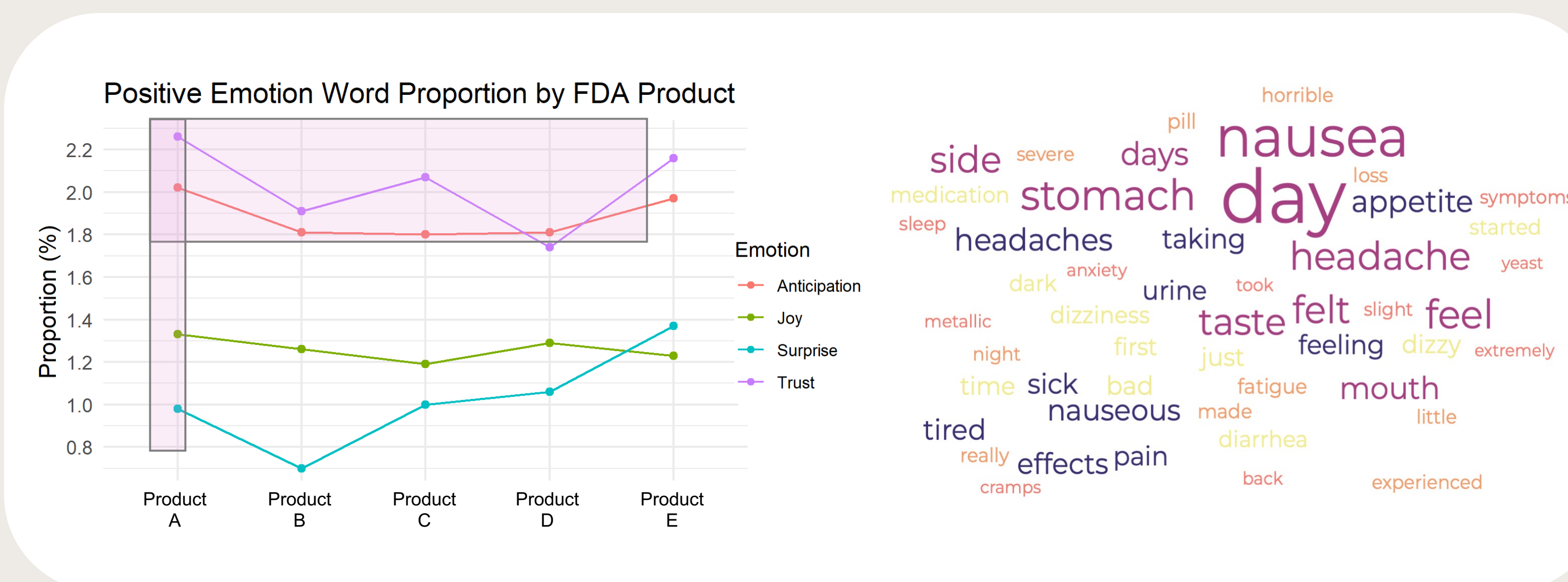
Validate scores with a human review

Qualitative Analyses
06
Themes can be summarized using qualitative description for a rich, straight description of an experience without the imposition of a theoretical or interpretative lens

DETERMINATION PROPORTIONS

Attribute: Product characteristics
Use: Reviewers' advice on how to use product
Side Effects: Intended or unintended effect (excludes "no side effects")
Value: Efficacy, price, worth, or usefulness
Adherence: Reviewers who stopped taking it
Condition: Disease state and its impact
Cross Product: Other products used & efficacy
Doctor: Interactions with a provider
Neutral: Dose, encouragement, questions

Pie chart values: 34%, 7%, 15%, 3%, 10%, 14%, 2%, 14%, 1%

LINE CHARTS & WORD CLOUDS

Positive Emotion Word Proportion by FDA Product — Proportion (%) vs Product A–E. Emotion: Anticipation, Joy, Surprise, Trust

THEMATIC ANALYSIS

I didn't have any of the side effects I read about. I did have some "leakage" the first couple of days and just used a liner. It's been a week and I seem to be back to my old self. I would definitely use this again, but this time use the coupon. With my insurance it cost me around $125.