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LDA-COVID19-Tweets

Temporal Modeling of COVID-19 Health Belief Phenotypes

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Motivation

- The COVID-19 pandemic has resulted in an “infodemic” of information regarding health, science, and public policy
- This influx of information not only reflects the public’s perception of our ongoing global health crisis but can also further influence it
- Understanding dynamics of public perception regarding COVID-19 is critical for strategizing policies to manage health
- Long term goals of this app: better understand the trajectory of health beliefs regarding COVID-19 and how they might change overtime

Web App

LDA-COVID19-Tweets

http://lda-t-publi-11a4tbf1s5d55-2039079140.us-east-1.elb.amazonaws.com/

Data

JOURNAL OF MEDICAL INTERNET RESEARCH Wang et al

Original Paper

Using Tweets to Understand How COVID-19–Related Health Beliefs Are Affected in the Age of Social Media: Twitter Data Analysis Study

Abstracted COVID-19 Twitter Chatter Data set constructed by the Panacea Lab

NLP Pipeline

5.5 million COVID-19 health related tweets

Health Beliefs

1. Perceived Susceptibility
2. Perceived Severity
3. Perceived Barriers
4. Perceived Benefits

Model

Latent Dirichlet Allocation (LDA) Topic Modeling

Corpus of Tweets → 1) Filter Date → 2) Pre-process text *(tokenize, remove punctuation, stop words)* → **Document Term Matrix**

3) Run LDA on Document Term Matrix and decide k topics → 4) Choose k with the max coherence (success metric!) →

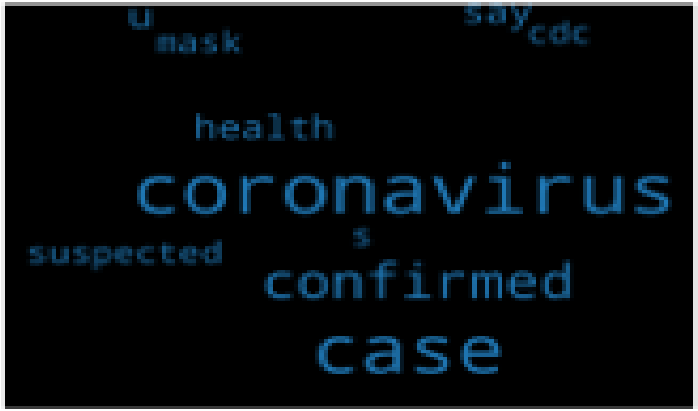
5) Generate visual word clouds → 6) Evaluate the probability of each original tweet belonging to a certain topic (mysql) – users can download/view the classified tweets → 7) Evaluate topics in the context or the original health beliefs annotations

Results – January 2020

Best model- Coherence value = 0.40

topic_num	Count	Susceptibility	Severity	Benefits	Barriers
0	103	90	3	0	0
1	180	139	35	1	0
2	594	416	85	11	0
3	528	430	41	10	0
4	2046	1856	208	6	0
5	2592	1739	1036	17	3
6	4038	2274	875	128	13
7	24365	17486	7618	185	9

Topic 0



Topic 5

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Thank You

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Repo: MSIA/2021-msia423-Hutch-Meghan-project