

**Hello Everyone!!! Good Morning & Good Afternoon!!!**

**Our topic to discuss today is - A critique of Twitter's response to COVID-19 vaccine misinformation**

**And this is Atreyee Dutta – Batch of 2025 Summer 2 to walkthrough the subject**

As the name interprets, we are here to evaluate Twitter's response to COVID-19 vaccine misinformation occurred entire year of 2021. For a brief background, Vaccinations play a critical role in mitigating the impact of COVID-19 and other diseases. Past research has linked misinformation to increased hesitancy and lower vaccination rates. Gaps remain in knowledge about the main drivers of vaccine misinformation on social media and effective ways to intervene.

- Introducing the concern that after outbreak of the COVID-19 pandemic, we have observed massive health-related misinformation - “infodemic” on multiple social media platform, also there are undermining public health policies to contain the disease
- Research prevalence of COVID-19 vaccine misinformation originating from low-credibility websites, compared to information published on mainstream news websites
- Uncovered role and the contribution of important groups of vaccine misinformation spreaders, namely verified and automated accounts

Our objective is (1) to investigate the patterns of prevalence and contagion of COVID-19 vaccine misinformation on Twitter in 2021, and (2) to identify the main spreaders of vaccine misinformation considered the likely drivers of misinformation and its spread, providing insights for potential interventions.

Idea is to focus on collected ~300 million English-language tweets related to COVID-19 vaccines using a list of over 80 relevant keywords over a period of 12 months then extracted and labeled news articles at the source level based on third-party lists of low-credibility and mainstream news sources, and measured the prevalence of different kinds of information. also considering suspicious YouTube videos shared on Twitter focusing our analysis of vaccine misinformation spreaders on verified and automated Twitter accounts.

Carried out methods like Twitter Data Collection, Identifying online misinformation, Sources of reliable misinformation, Link extraction, BOT Detection, Ethical Consideration where time series analysis of Twitter Data Collection visualization shows median daily number of tweets is 720,575 where 90% of the TWEETS with common keywords

**Prevalence and Contagion of Online Misinformation**

- Prevalence of tweets that linked to domains in low-credibility and mainstream sources over time for suspicious YouTube videos

Figure A-B, we observed a significant increasing trend in the daily prevalence of low-credibility information over time and a significant opposite trend for mainstream news. This is further confirmed in Figure C, which shows the daily ratio between the volumes of tweets linking to low-credibility and mainstream news. A significant increasing trend was observed, suggesting that the public discussion about vaccines on Twitter shifted over time from referencing trustworthy sources in favor of low-credibility sources. The peak in July corresponds to a time when the prevalence of mainstream news was particularly low.

Figure D, Daily percentage of tweets sharing links to inaccessible YouTube videos among all tweets sharing links to YouTube. There is a significant decreasing trend.

Analyzing on another figure for Mainstream & Low-Credibility websites, with respect to % of tweets & % of tweets that are re-tweeted

- misinformation generally less prevalent than mainstream news (Figure A)
- low-credibility content tended to spread more through retweets compared to mainstream content (Figure B)

### **Superspreaders of Misinformation**

Another Figure to identify All tweets, low-credibility news, inaccessible Youtube videos how they are with respect to % original posters & % all retweets earned by verified posters

median daily proportions of verified accounts among posters of vaccine content, low-credibility news, and inaccessible YouTube videos are 15.4%, 5.6%, and 4.5%, respectively. The median daily proportions of retweets earned by verified posters of vaccine content, low-credibility news, and inaccessible YouTube videos are 43.1%, 34.2%, and 13.2%, respectively. All distributions are significantly different from each other according to two-sided Mann-Whitney tests ( $P < .001$ )

**Role of Social Bots** - Employing BottomometerLite distributions of daily average bot scores for tweets sharing vaccine content, links to low-credibility sources, and inaccessible YouTube videos

Comparison between the daily average bot score of tweets sharing different categories of vaccine content. The median daily average bot scores of accounts sharing vaccine content, low-credibility news, and inaccessible YouTube videos are 0.22, 0.25 and 0.26, respectively. All distributions are significantly different from each other according to two-sided Mann-Whitney tests ( $P < .001$ )

As a result, findings showed a relatively low prevalence of low-credibility information compared to the entirety of mainstream news. However, the most popular low-credibility sources had reshare volumes comparable to those of many mainstream sources, and had larger volumes than those of authoritative sources such as the US Centers for Disease Control and Prevention and the World Health Organization. Throughout the year, observed an increasing trend in the prevalence of low-credibility news about vaccines. Also observed a considerable amount of suspicious YouTube videos shared on Twitter. Tweets by a small group of approximately 800 “superspreaders” verified by Twitter accounted for approximately 35% of all reshares of misinformation on an average day, with the top superspreader (@RobertKennedyJr) responsible for over 13% of retweets. Finally, low-credibility news and suspicious YouTube videos were more likely to be shared by automated accounts

To conclude, wide spread of misinformation around COVID-19 vaccines on Twitter during 2021 shows that there was an audience for this type of content, findings are also consistent with the hypothesis that superspreaders are driven by financial incentives that allow them to profit from health misinformation. Despite high-profile cases of deplatformed misinformation superspreaders, results show that in 2021, a few individuals still played an outsized role in the spread of low-credibility vaccine content. As a result, social media moderation efforts would be better served by focusing on reducing the online visibility of repeat spreaders of harmful content, especially during public health crises

THANK YOU!!!