



# The US Anti-Vaxxers on Twitter: An Exploratory Study Using Network Analysis

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## Problem Statement & Research Question

- 30% of the US population (> 18 years of age) not fully vaccinated against covid-19.
- Understanding resistance is important for disease prevention & provides important insights on how to counter attitudes effectively.
- How are the US Anti-Vaxxers connected and what are their narratives on Twitter?**

## Theory

- Exposure to online information critical of vaccination → **stronger anti-vaccine beliefs.**
- “Disinformation Dozen” report identifies the 12 most influential actors spreading anti-vaccination content on social media.

## Data & Methods

### Step 1: Data Collection

- Compilation of **36.388** tweets from **7** influential Twitter users **between 1/1/2020 – 11/30/2021**
- (Lended) Access via Twitter Academic API.

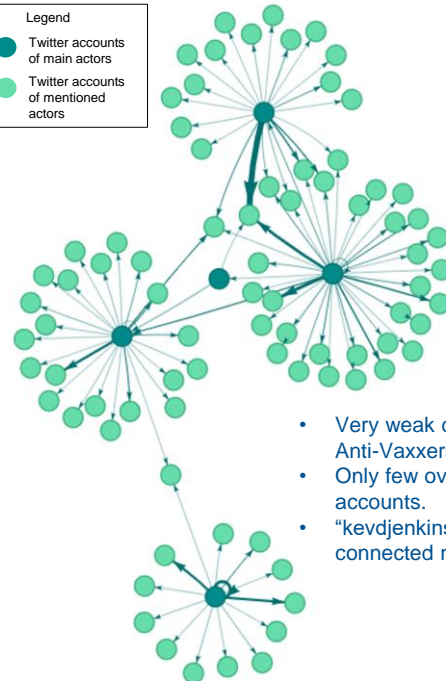
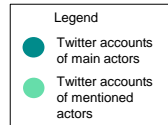
### Step 2: Pre-Processing & Cleaning

- Importing data:** import nested data into dataframe.
- Pre-Processing:** text parsing via **spacyr-package**, incl. tokenizing, pos-tagging.
- Cleaning:** lowercasing, removing stop-words, punctuation and other negligible tags as well as URLs, emojis, double space, hashtags and @mentions.

### Step 3: Transformation & Analysis

- Bag of words approach sorted by month.
- Keyword extraction** (partially manually) for frequency tables of keywords by users.
- Network analysis** based on user mentions, definition of edges and nodes, matrix transformation, and data scaling.

## Network of the five main Anti-Vaxxers and their mentioned Twitter accounts

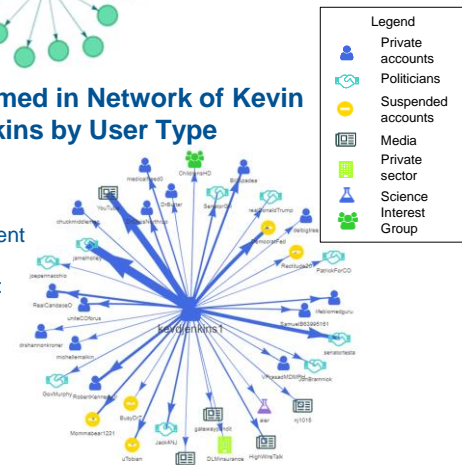


Connections between Anti-Vaxxers and other Actors

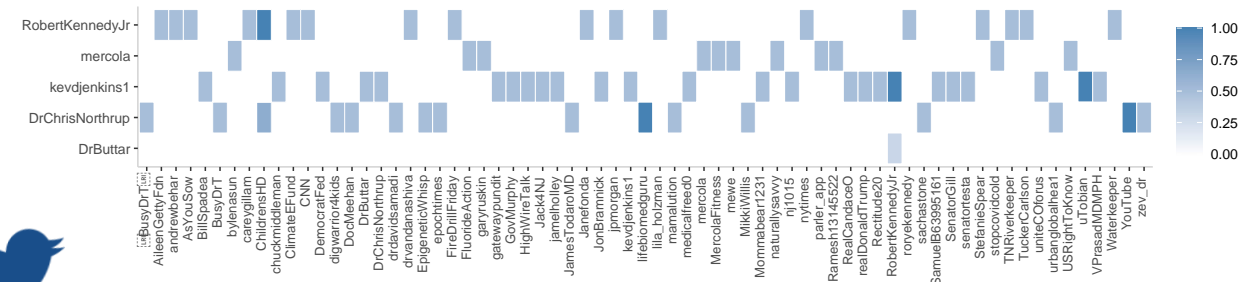
- Very weak connections between Anti-Vaxxers → own bubbles
- Only few overlaps of mentioned accounts.
- “kevjdjenkins1” is most connected node.

## Zoomed in Network of Kevin Jenkins by User Type

- Kevin Jenkins mentions different user types
- Top user types: other users, politicians, suspended accounts, and media

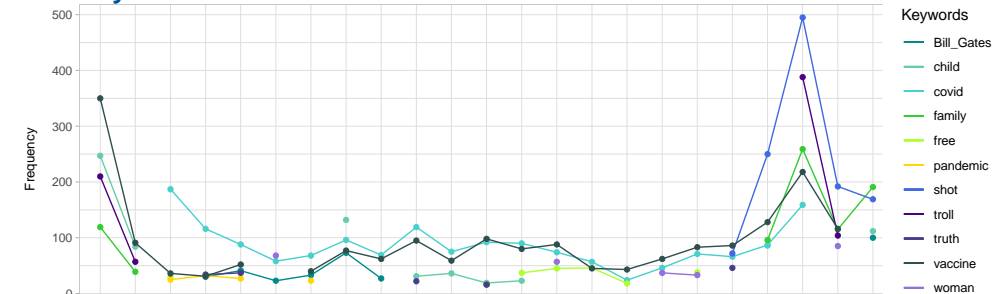


## Density of User Mentions by Main Anti-Vaxxers (All Users with Mentions > 4)

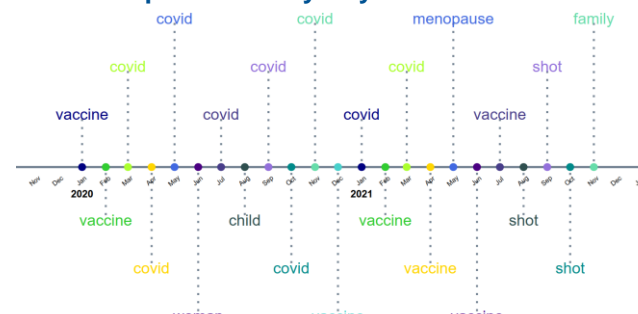


## Anti-Vaxxer Content over Time

### Keyword Trends over Time



## Most Frequent Monthly Keyword



## Takeaways

- Weak connections between the five main users. **Mentions relate to other individuals, politicians, and media** (outlets)
- Keywords cover **known conspiracy content & real-world developments.**

## Challenges

- Deleted accounts made **sample smaller than expected** (only 5 out of 7 users relevant for network analysis).
- None of us had access to Academic API.