Evaluating the Anti-vaccination Community on Twitter

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Introduction:

Health and medical experts have hailed vaccines as being one of the major achievements in the 20th century, but not everyone agrees. Despite being a century-old concept, vaccination opposition has been gaining momentum in the past few years (Gotter, 2017). And the recent global outbreak of the novel coronavirus disease 2019 (COVID19), which has caused enormous losses in terms of both public health and economy, has yet pushed the anti-vaccination movement to a new height. While most of the world hungers for a vaccine to put an end to this disaster, some anti-vaccine activists are seizing on the anti-government sentiment stoked by conservative-leaning protesters to advance their causes (Szabo, 2020). And that includes the extensive spread of lies, half-truths, and unverified rumors related to COVID19 and vaccine on popular social media platform Twitter. A striking example is the trending of #ExposeBillGates hashtag on Twitter as the result of coordinated efforts by anti-vaccination activists and conspiracy theorists (Meisenzahl, 2020). Such a phenomenon is alarming since it can lead to devastating outcomes, like the re-emergence of infectious diseases in areas where they had been eradicated or nearly gone or, in the case of COVID19, more deaths and slower economic recovery (Gotter, 2017). In this report, I seek to gain more insights regarding the anti-vaccination community by analyzing the related information being spread on Twitter.

Materials & Methods

Data collection: During this pandemic, the only anti-vaccination-related hashtag trended on Twitter is #ExposeBillGates. So, I chose it to study the anti-vaccination community on Twitter. So, I collected the tweets with hashtag #ExposeBillGates between 2020 Jun. 21st and 2020 Jun. 23rd using the Twitter Archiving Google Spreadsheet (TAGS). After clearing up all the retweets (containing "RT" in the spreadsheet generated by TAGS), I randomly sampled 100 tweets from the remaining tweets as the primary data to study in this paper.

Coding Process: For every tweet and its posters, a set of predetermined features were manually coded (**Table 1**). As I've noticed that some posters only share, comment, and promote certain type of information, I coded the tweet posters into two categories: the informal personal accounts (labeled as "personal") and the accounts dedicated to spreading specific types of information, including activities, individual journalists, doctors, and NGOs etc. (labeled as "dedicated"). A tweet poster was also categorized into "left," "right," or "unsure" by looking into the political leaning of the tweets of that poster.

Poster Type	Political Leaning	Type of Communication	Contain Rumor?	Rumor Association
Personal	Left	Sharing	Rumor	Dirty-money
Dedicated	Right	Discussing	Indirect	Africa
	Unsure	Supporting	None	Vaccine-bad
		Motivating		Plandemic
		hating		Depopulation
				Mosquitos
				Murder
				Obama
				Anti-china
				Facebook
				Global-warming

Table 1: **List of Coding**

Tweets were labeled with the following information: Type of

Communication, Contain Rumor, and Rumor Association. I identified five types

of communication - sharing, discussing, supporting, motivating, and hating -

based on the content of the collected tweets. A tweet is identified as "sharing"

if the main purpose is to share certain information that "exposes" Bill Gates;

"discussing" if there's actual discussion or analysis; "supporting" if supporting

other accounts that "expose Bill Gates" by responding to those accounts;

"motivating" if trying to call on others to "expose"; "hating" if simply hate or

curse on Bill Gates. I also identified whether the tweets were associated with

certain rumors; if so, which rumors were the prominent ones, as most tweets

are associated with multiple rumors (Wikipedia, 2020) (**Table 2**). Some tweets

were not directly associated with rumors, but indirectly involved them by either supporting rumor spreaders or motivating others to "expose." These tweets are labeled as "indirect."

Rumor Code	Description
Dirty-money	Bill Gates is earning dirty money by funding the vaccine; usually associated with left-wing figures as well.
Africa	Bill Gates is doing human experiments on Africans and is killing them.
Vaccine-bad	Unverified or exaggerated negative effects of vaccines.
Plandemic	The pandemic is non-existent or is a planned bio-attack.
Depopulation	Bill Gates is using vaccines to depopulate human race.
Mosquitos	The mosquitoes can transmit the coronavirus.
Murder	Nisha Patel, employee of Bill Gates who oversaw 17 billion grants, is murdered by him.
Obama	Information about the "Obamagate."
Anti-china	China has dirty association with WHO.
Facebook	Related to #ExposeFacebook
Global-warming	Bill Gates is making global warming worse.

Table 2: **Description of Coded Rumors**

Results

Poster Characteristics: After removing the duplicated tweets, I used 93 tweets for the following study. More tweets are posted by the "dedicated" posters (58, 62.4%) than the "personal" posters (35, 37.6%) **(Figure 1)**. Most posters are right leaning (86, 92.5%) and there are only 2 left leaning posters (2, 2.2%) and a handful that are unsure (5, 5.4%) (**Figure 2**).
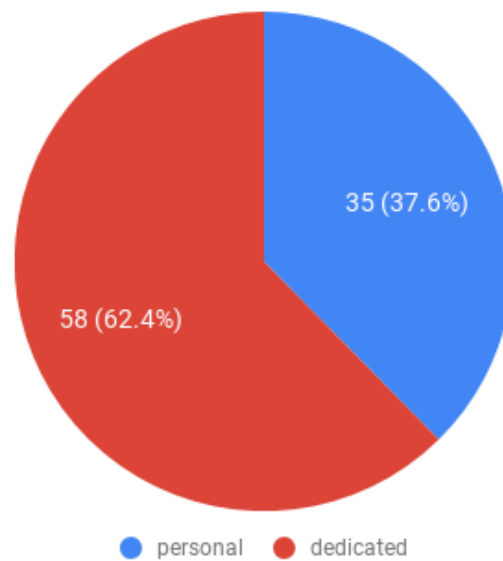
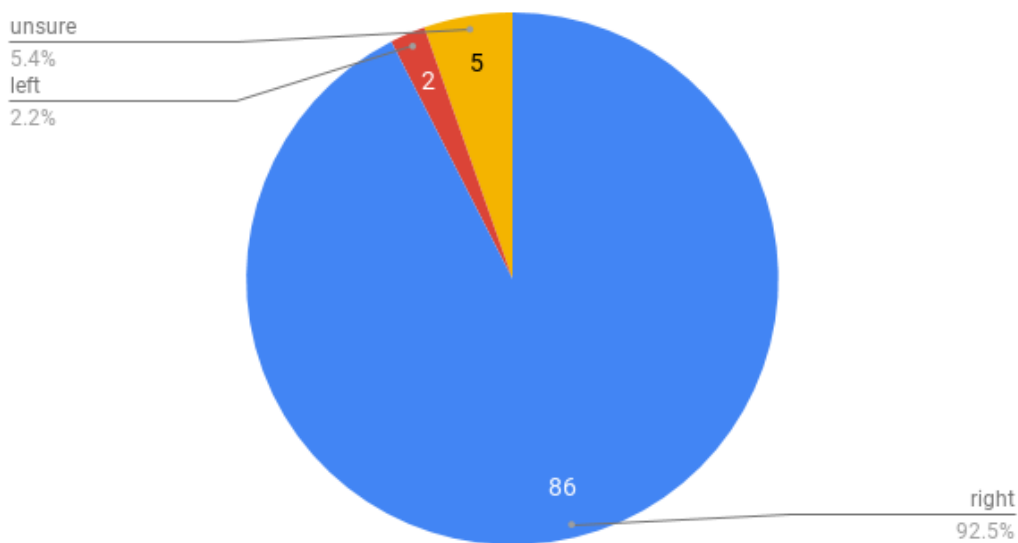Poster Type

Figure 1. **Type of Posters**

Political leaning

Figure 2. **Political Leaning of Posters**

Tweet Characteristics: The most common type of communicating is

"sharing" (72, 77.4%), followed by "supporting" (12, 12.9%), "discussing" (6,

6.5%), "motivating" (2, 2.2%) and one "hating" tweet (1, 1.1%) **(Figure 3)**. All

the "hating" and "motivating" tweets are posted by "dedicated" posters, while there are twice as many tweets posted to "discuss" and "support" by "personal" posters than "dedicated" posters. Also, "dedicated" posters posted much more "sharing" tweets in absolute number (49 vs. 23) and in proportion (84.5% vs. 65.7%) (**Figure 4**).
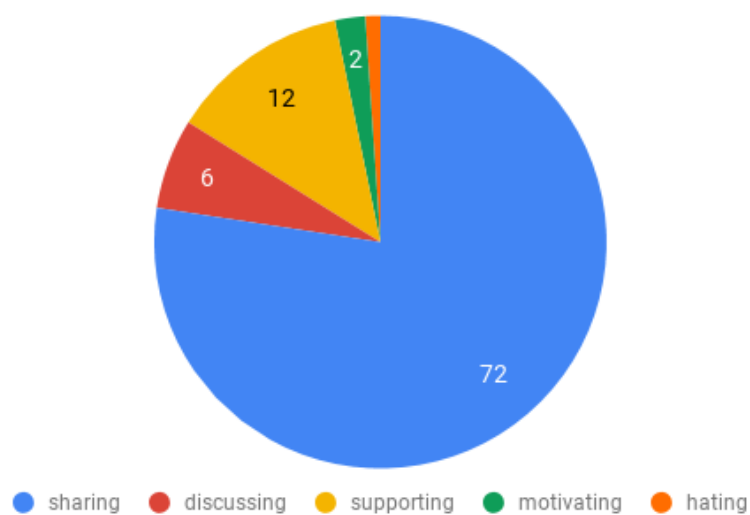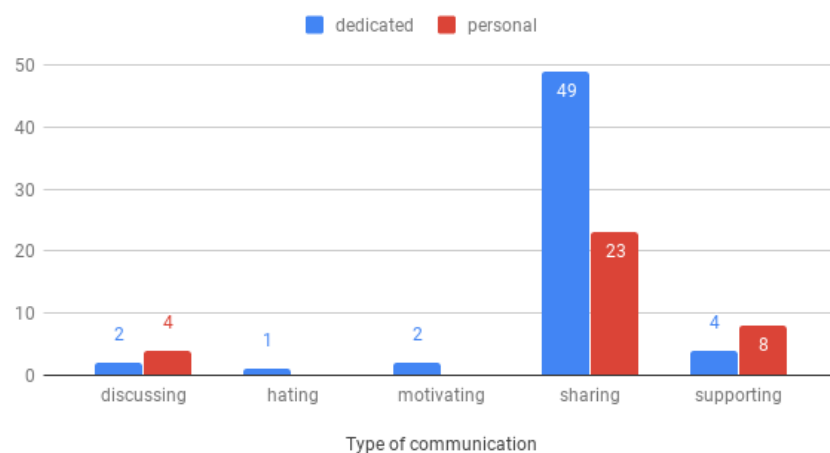

Figure 3. **Type of Communication**

Figure 4. **Type of Communication by Type of Poster**

Most tweets directly contain rumor information (70, 75.3%). There are

some tweets that indirectly involve rumors (16, 17.2%) and only a few that

don't involve rumors at all (7, 7.5%) (**Figure 5**). As **Figure 6** shows, among the

tweets that directly contain rumors, "Africa" (14), "depopulation" (14),

"Obama" (11) are the most mentioned ones, followed by "dirty-money" (8),

"vaccine-bad" (7), "murder" (7), and "plandemic" (5). There are also rumors on

"mosquitos" (1), "anti-china" (1), "Facebook" (1), and "global-warming" (1).

All 11 "Obama", 1 "anti-china," 1 "Facebook," and 1 "global-warming"

rumors are shared by only "dedicated" posters. Except for the one

"mosquitos" and one "Africa" rumors, "dedicated" posters share more rumors
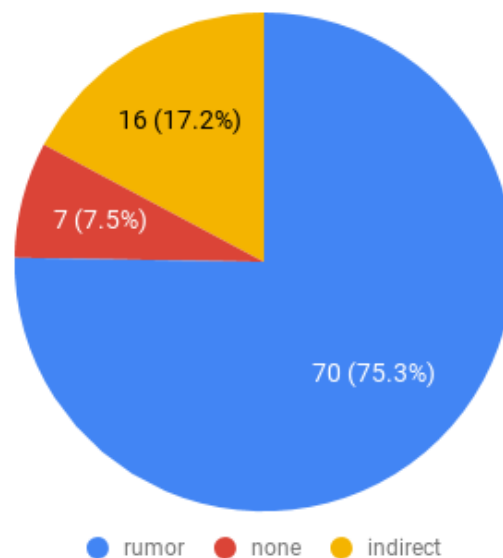
than the "personal" posters (**Figure 6**).
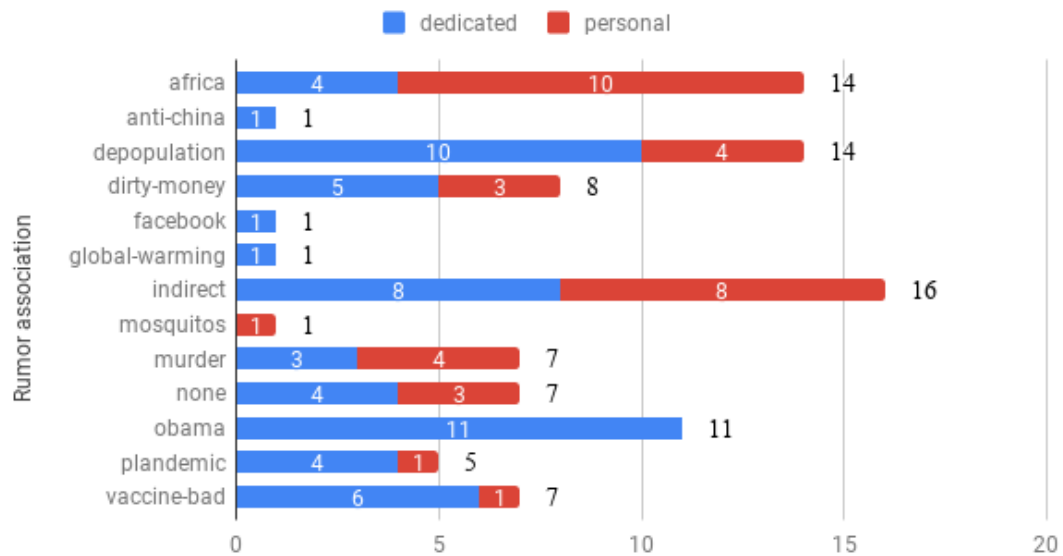

Figure 5. **Rumor Involvement**

Rumor Associations

Figure 6. **Rumor Association by Type of Poster**

Discussion

There is an alarming number of "dedicated" twitter accounts spreading rumors (58, 62.4%) in this community. These "dedicated" posters are all right-learning and are more likely to share rumors in general (especially politically related rumors). In fact, all 11 "Obama" rumors are shared by only 2 "dedicated" posters. They also seem to be pushing their opinion hard on related issues, usually sending multiple tweets on the same topics every day.

There's also a dangerous rate of rumor association among this community. Most tweets directly or indirectly involved rumors (86, 92.5%). And within those rumors, most contain negative information about vaccines (43, 61.4%), while the rest are mostly connected with political problems like "Obamagate."

These rumors are often associated with right-wing conspiracies like #qanon and #thegreatawakening.

In terms of the communication type, there's certainly a lack of critical communication in this community on Twitter. Most tweets simply shared rumors or supported posters that share rumors. Very few tweets discussed related issues. The "dedicated" accounts are even more likely to hate and to persuade others to share rumors, and less likely to discuss the related issues in depth. And there's not one tweet under this hashtag that disagrees with the rumors mentioned.

In short, the anti-vaccination community is heavily right-leaning, rumor-associated, uncritical, and is push by a large group of dedicated spreading related information. This community seems to commonly mix up with the right-wing conspiracy theory community by the combination of hashtags. These features made this community a perfect place for rumors to spread, which doesn't require any curation, peer-review, or professional verification. This can also be amplified by the information silos and echo chambers of personally tailored content on Twitter (Chou et al., 2018, p. 2417).

This study is limited to only one hashtag and 100 tweets. So further study can be done by extending the number of hashtags and tweets to gain more insights on the topic.

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