



A PRELIMINARY EXPLORATION OF THE PREVALENCE OF AUTOMATED SOFTWARE PROGRAMMES
AND SOCIAL BOTS IN THE COVID-19 #ANTIVAXX DISCOURSE ON TWITTER
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BAD ROBOT



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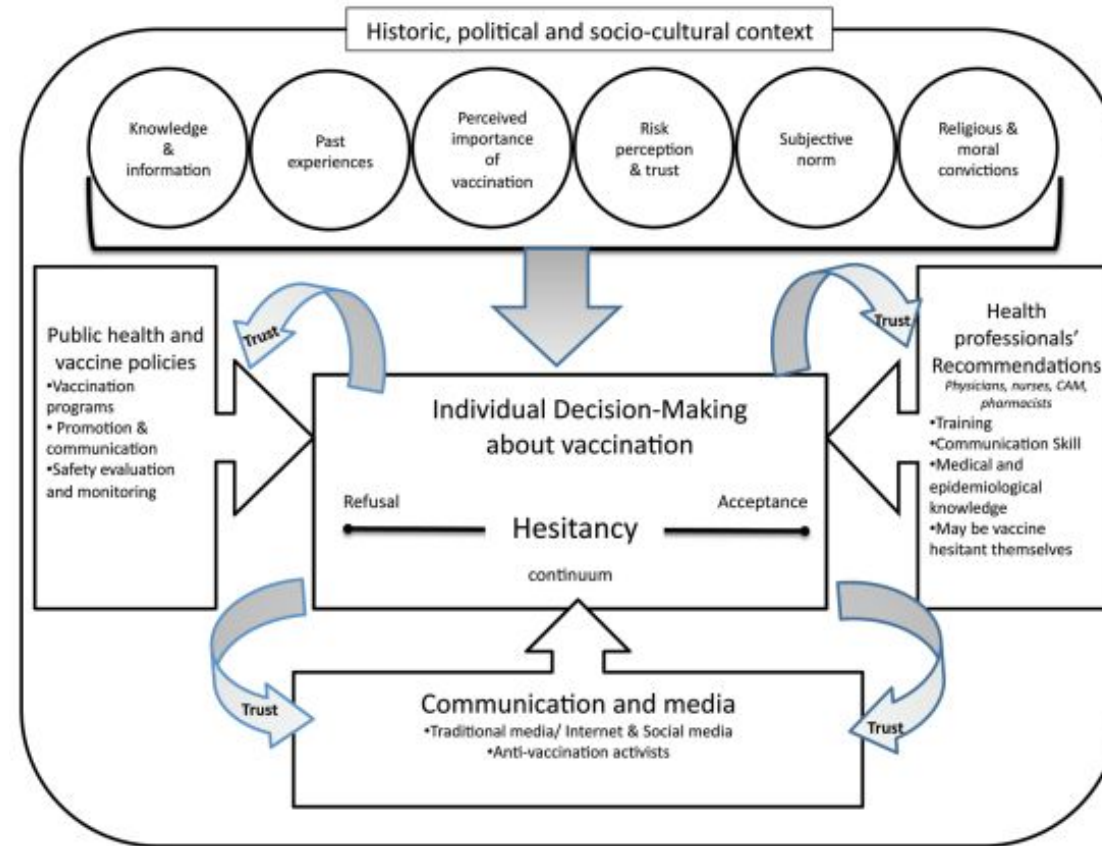
About Antonia Egli

- Postgraduate Researcher, Irish Institute of Digital Business at Dublin City University
- Research focus on identity, legitimacy and the spread and influence of fake news within online subcultures, specifically vaccination deniers on social media
- MSc in Digital Business

**VACCINE HESITANCY CONTRIBUTES TO 1.5 MILLION AVOIDABLE DEATHS PER
ANNUM [1]**

THAT WAS BEFORE COVID-19

Vaccine hesitancy lies on a continuum from vaccine acceptance to vaccine denial and is influenced by a variety of factors.



[3]

We're not just fighting an epidemic; we're fighting an infodemic.



Tedros Adhanom Ghebreyesus
Director-General of the World Health Organization
[2]

The anti-vaxx movement comprises vaccine deniers or individuals who fully oppose vaccinations and has contributed to numerous disease outbreaks [4-6].

1970
DTP

Opposition to Diphtheria, Tetanus, and Pertussis and formation of The Association of Parents of Vaccine Damaged Children (APVDC) with medical endorsement.

2018
Green our Vaccines

Concerns over Thimerisol, a preservative has resulted in concerns over autism driven by celebrity endorsed campaigns- Generation Rescue, and the organization Talk about Curing Autism (TACA).

1990s
MMR

Driven by fraudulent medical research and media confusion, MMR vaccines were linked to autism.

2020
COVID-19

Misinformation on COVID-19 vaccines reinforced by senior political leaders and celebrities and COVID-19 specific movements.

1800s
Smallpox

Anti-vaccination protests including celebrity endorsements and formation of Anti-Vaccination Leagues

The WHO is tracking over 30 discrete topics in its COVID-19 mythbusters website alone [12].



Home / Diseases / Coronavirus disease (COVID-19) / Advice for the public / Mythbusters

Coronavirus disease (COVID-19) advice for the public: Mythbusters

< Coronavirus disease (COVID-19)
< Advice for the public

Mythbusters

When and how to use masks

Videos

Advocacy

5 May 2021

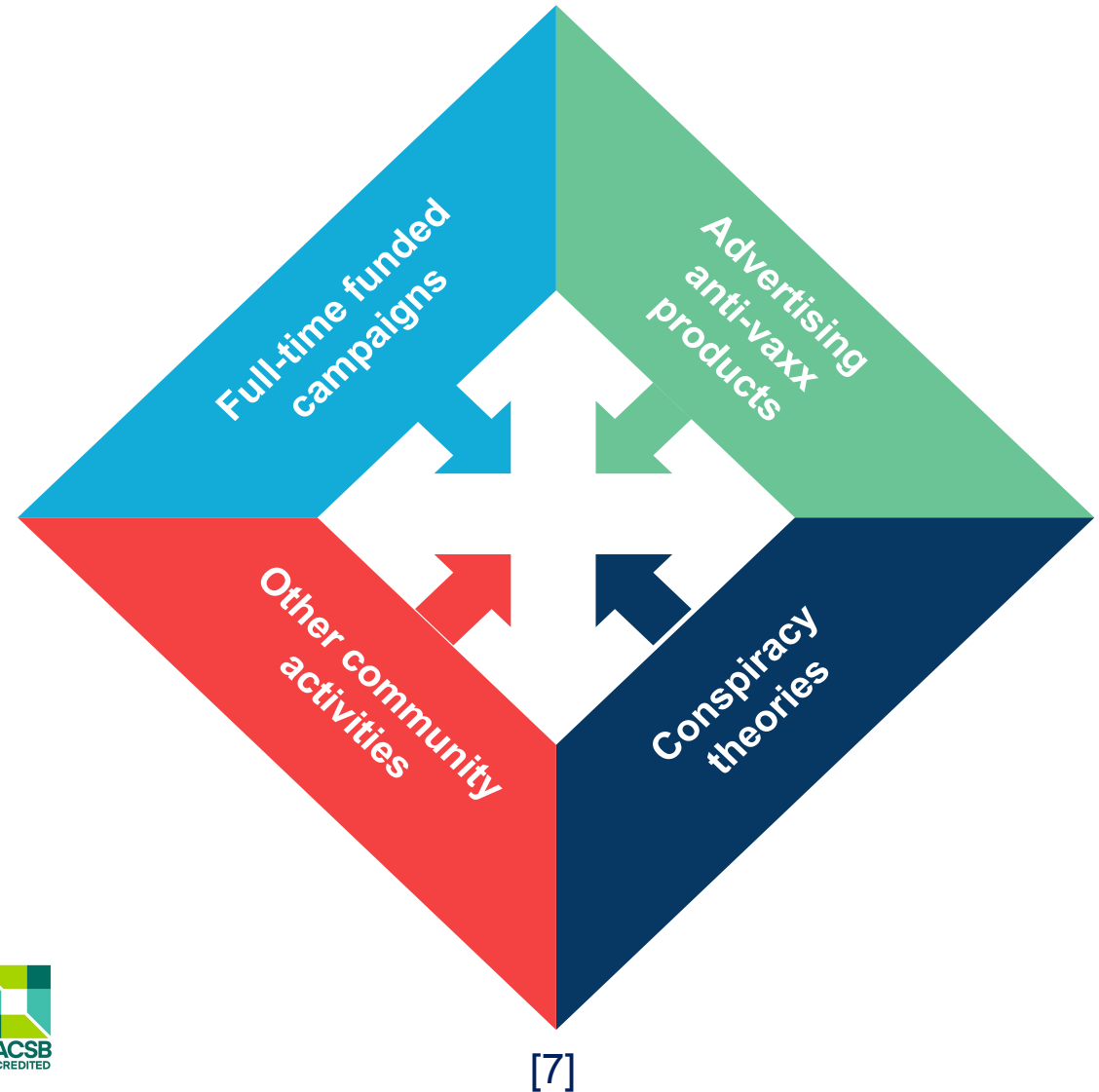
How to report misinformation

- 5G Mobile networks
- Alcohol
- Antibiotics
- Bleach
- Cold weather, snow
- Dexamethasone
- Drugs
- Garlic
- Hand dryers
- Holding your breath
- Hot and humid climates
- Hot baths
- Hot peppers
- Houseflies
- Hydroxychloroquine
- Masks, CO2 intoxication
- Masks, exercise
- Medicines
- Methanol, ethanol
- Misinformation
- Mosquitoes
- Older people, younger people
- Pneumonia vaccines
- Recovery
- Reduce risk of infection
- Saline
- Shoes
- Sunny and hot weather
- Supplements
- Swimming
- Thermal scanners
- Ultra-violet (UV) lamps
- Viruses, bacteria, antibiotics

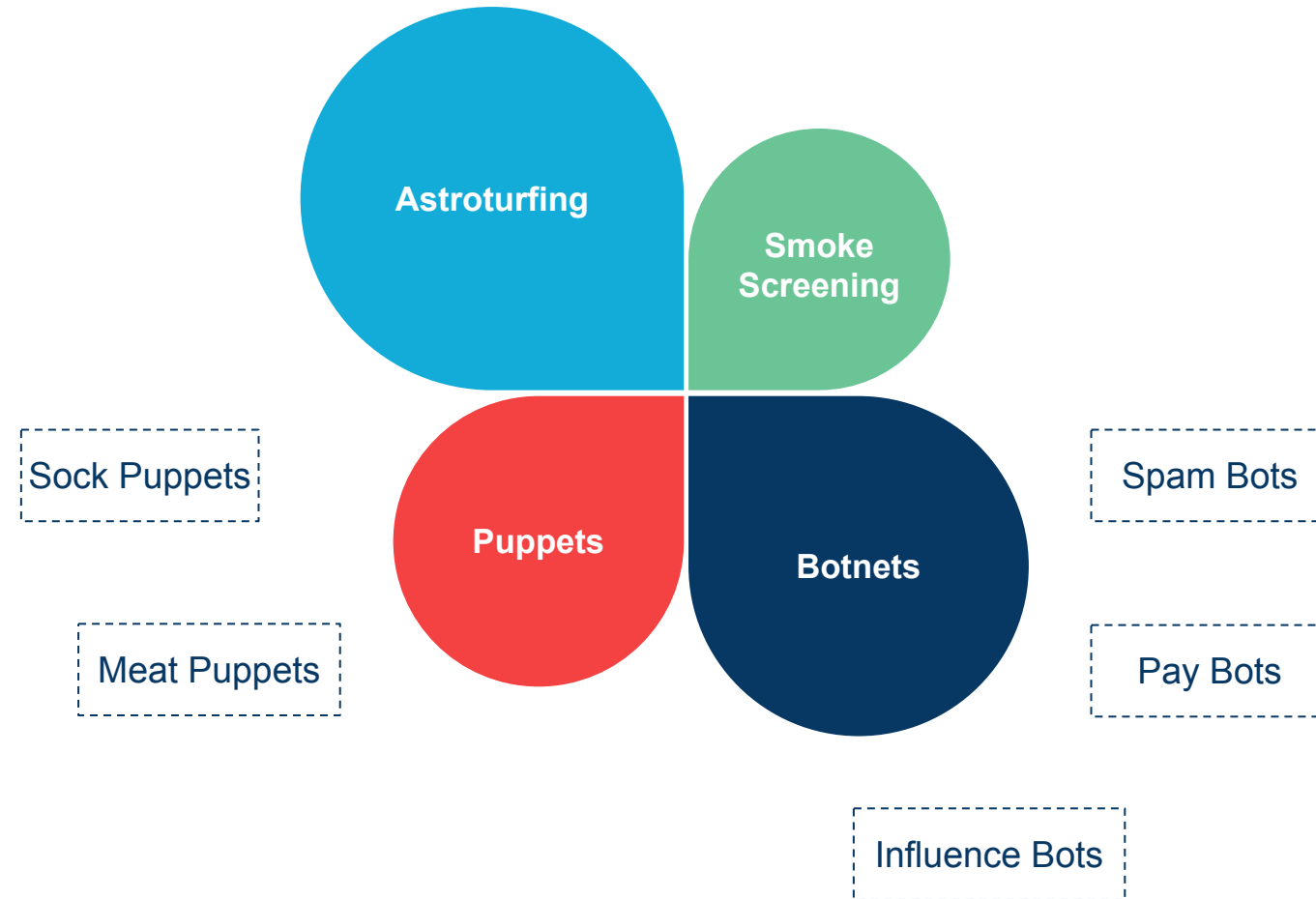
The Centre for Countering Digital Hate (CCDH) estimates over 59.2m people follow anti-vaxx social media accounts growing by at least 7.8m since 2018.

Anti-vaxx Positions:

- Questioning the safety and effectiveness of vaccines
- Sharing conspiracy theories online
- Publishing general misinformation and rumours
- Promoting that big pharma and scientific experts are not to be trusted
- Stating the civil liberties and humans' freedom of choice are endangered
- Questioning whether vaccinated individuals spread diseases
- Promoting alternative medicine

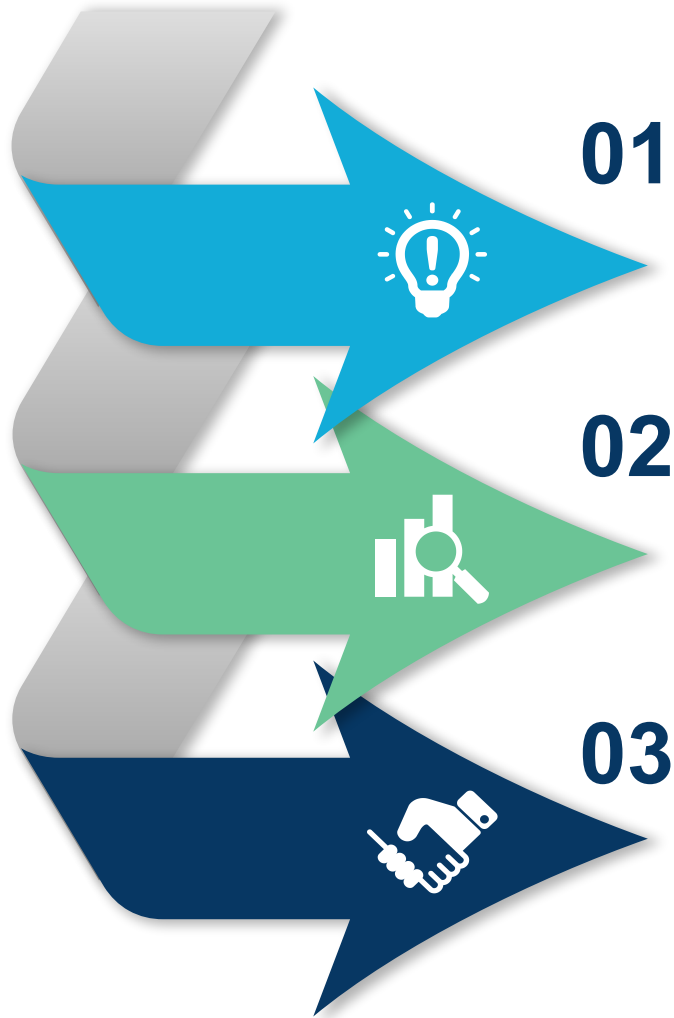


Social media manipulation and deception make use of a wide range of sophisticated tactics [8]-[11].



THE ANTI-VACCINATION MOVEMENT HAS USED THESE TACTICS TO INFLUENCE VACCINATION NARRATIVES AND DECISION-MAKING PROCESSES [13].

What we wanted to know...

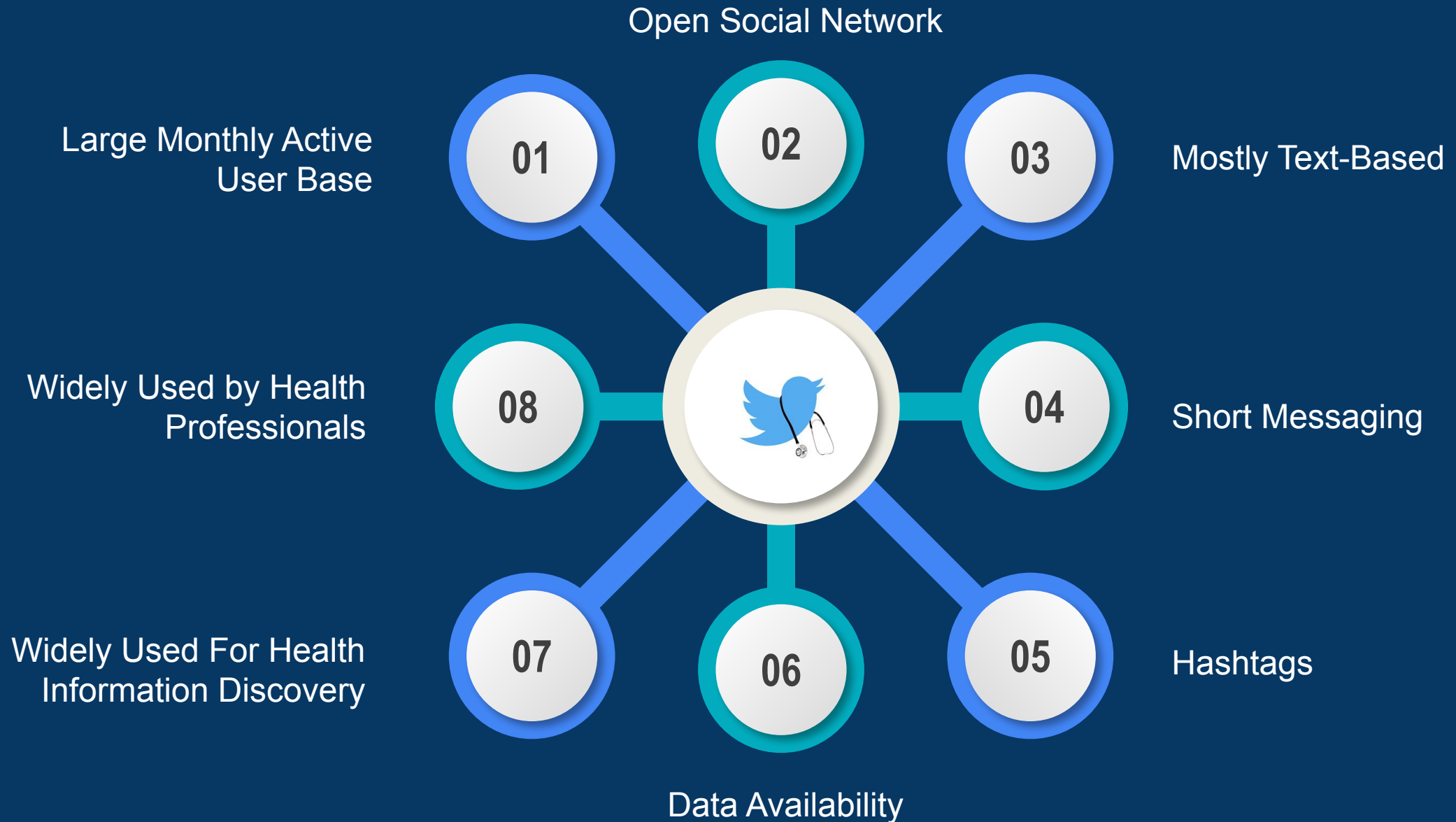


To what degree are automated software programmes used in the #antivaxx discourse on Twitter?

Does automated software usage differ between highly visible and highly active Twitter accounts in the #antivaxx discourse on Twitter?

How effective is Twitter at moderating content that is potentially harmful to the public?

Why Twitter?



The data is historic raw Twitter data gathered from December 2020

Only English language tweets featuring the #antivaxx hashtag were included.

Metric	Count	Percentage
No. of Distinct Users	7721	-
Total Tweets	8949	100%
No. of Original Tweets	2301	25.71%
No. of Replies	336	3.74%
No. of Retweets	6312	70.53%
No. of Tweets with URLs	1680	18.77%
Avg. Tweets per User	0.3	-

To what degree are automated software programmes used in the #antivaxx discourse on Twitter?

Twitter *generator* metadata was extracted, including:

- Name of source application
- Link to source application

Approx. 45 generators (54% of all generators) self-identified as bots or exhibited bot behaviour.

Generator	No. of Tweets	No. of Users
Twitter Client	94.68%	97.71%
Bot	3.36%	0.86%
Third Party Twitter Client	1.21%	0.89%
Social Network	0.20%	0.18%
Other	0.54%	0.36%
Total	100.00%	100.00%

Only 1%-2% of all users used automated software however these accounts generated 3.5%-5% of all tweets.

Does automated software usage differ between highly visible and highly active Twitter accounts in the #antivaxx discourse on Twitter?

The top 100 active users generate nearly 4x more original tweets than top 100 visible users

21% of the top 100 active users were given a high or very high bot rating by IUNI Botometer compared to 6% of the top 100 visible users

Bot behaviour was driven by (i) bot self declaration, (ii) echo chamber behaviour, and (iii) high fake follower counts.

Metric	Count	Percentage
No. of OTs by Most Active Users	387	16.82%
No. of OTs by Most Visible Users	100	4.35%

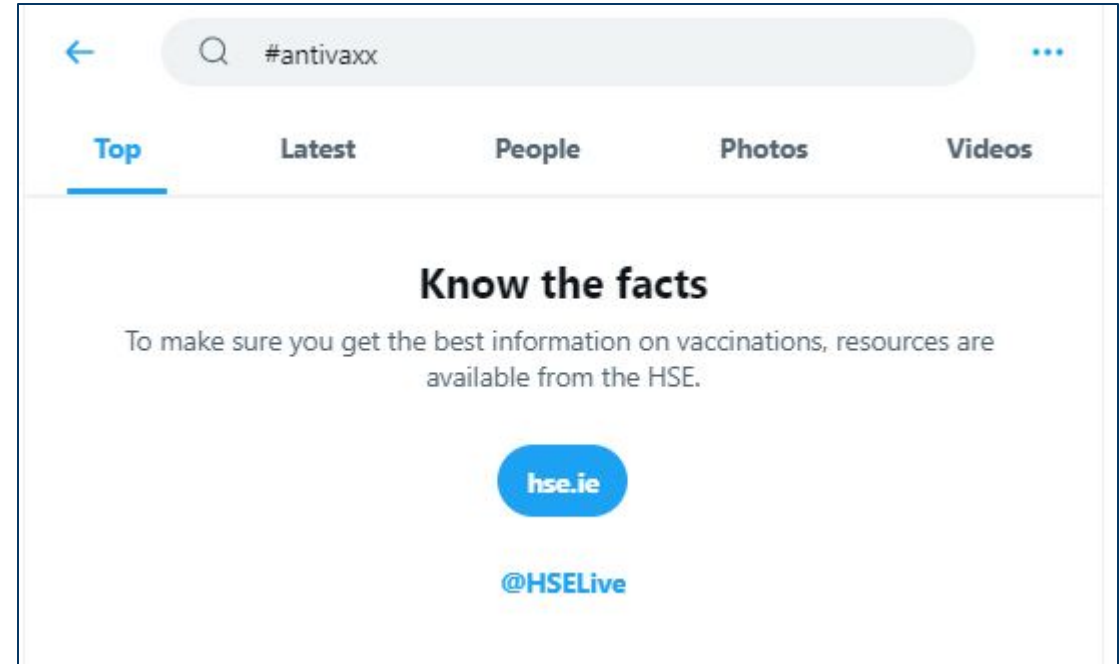
Bot Score	Active Users	Visible Users
Very High	9	1
High	12	5
Medium	2	6
Low	19	21
Very Low	36	51
Suspended/No Longer Accessible	22	17

The IUNI Botometer leverages over 1,000 features from a Twitter account and its activity including astroturfing, spamming, bot self-declaration, fake follower count etc.

How effective is Twitter at moderating content that is potentially harmful to the public?

Automated software does not equate to true #antivaxx supporters. Only one of the high probability bot users was a true #antivaxx supporter.

Analysis of the suspended accounts in the top 100 suggested higher proportions of suspended accounts were true #antivaxx supporters (9/39 suspended accounts)



Final Remarks

01

False information can result in individual citizens becoming vaccine hesitant or vaccine deniers

02

Countering the anti-vaccination movement is a significant multi-stakeholder challenge requiring active intervention.

03

There is evidence that the pro-vaccination community and platforms were effective in the initial COVID-19 #antivaxx discourse. Further research on the wider discourse is required.

04

Understanding the different mechanisms being used by anti-vaccination promoters can mitigate the adverse effects of the anti-vaxx movement and restore faith in vaccines and vaccinations

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THANK YOU

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