Questioning Vaccination Discourse (Quo VaDis): A Corpus-based Study

Vaccine hesitancy

- Vaccine hesitancy – 'a delay in acceptance or refusal of vaccines despite availability of vaccination services' – was identified by the World Health Organisations as one of the top 10 global health threats in 2019.

- A 2014 WHO report from the Strategic Advisory Group of Experts on Immunization (SAGE) includes three categories of determinants of vaccine hesitancy [9]:

  1. 'contextual influences' (e.g., religion, culture, politics, media environment);
  2. 'individual and group influences' (e.g., previous experiences with vaccinations by the individual and their kinship and social groups, immunization as a social norm or as not needed or harmful); and
  3. 'vaccine/vaccination-specific issues' (e.g., new vaccine, mode of administration, cost, risks vs. benefits).

The 'Questioning Vaccination Discourse' (Quo VaDis) project

- Views, attitudes and decisions about vaccinations are both reflected in and shaped by 'discourse', broadly conceived.

- The Quo VaDis project applies corpus-based discourse analysis to the study of naturally-occurring discussions about (childhood) vaccinations in corpora drawn from:
  - Social Media: Mumsnet, Twitter, Reddit
  - News reports
  - Hansard Parliamentary records
  - Victorian anti-vaccination literature

The Team

Prof. Elena Semino
Principal Investigator
Lancaster University

Dr Tara Coltman-Patel
Senior Research
Associate
Lancaster University

William Dance
Senior Research
Associate
Lancaster University

Dr Zsófia Demjén
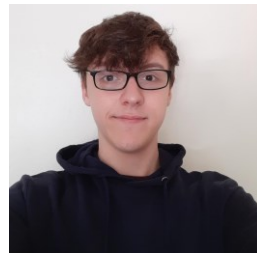Co-Investigator
University College
London

Dr Claire Hardaker
Co-Investigator
Lancaster University

Dr Derek Gatherer
Co-Investigator
Lancaster University

Prof. Alice Deignan
Co-Investigator
University of Leeds

Chris Sanderson
Researcher
Lancaster University

Dr Vaclav Brezina
Co-Investigator
Lancaster University

Prof. Robert Geyer
Co-Investigator
Lancaster University

Richard Gleave
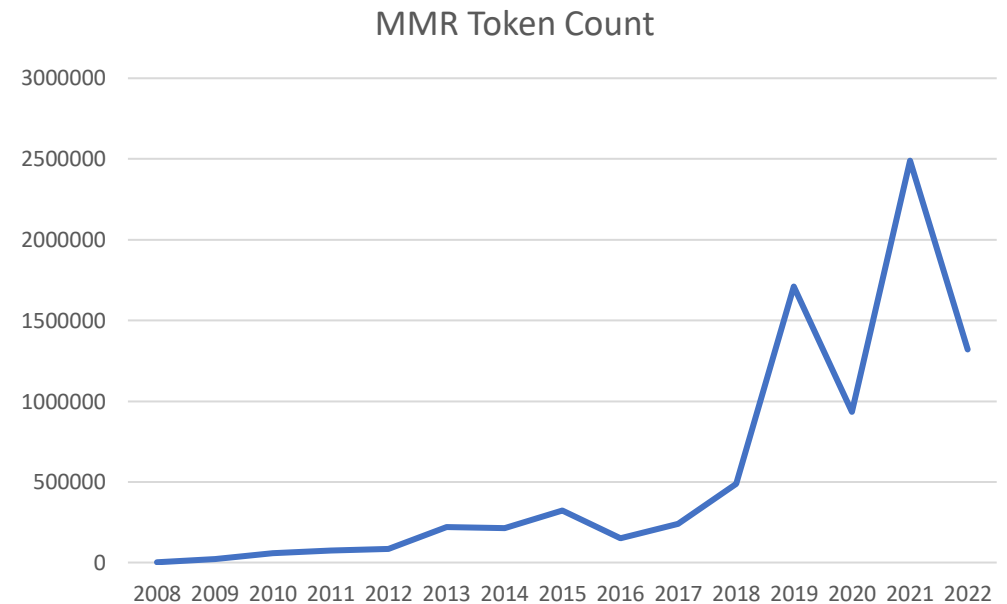Co-Investigator
UK Health Security
Agency

One of our datasets

- A 'corpus' including all tweets in English mentioning *MMR* alongside *vacc*/vax**, 2008-2022.

|	Tweet Count	Token Count
MMR	272,638	8,338,984

18 month pedi appt today. Gearing up to defend my decision to skip chickenpox #vax & delay MMR until age 2. #MamasTheDecider

3:27 PM · Apr 18, 2011

MMR Token Count

Covid in the MMR Twitter corpus

- In the corpus, *covid** occurs 26,061 times in 22,792 different tweets.

- We compiled half-year corpora following the onset of COVID-19 (January 2020), resulting in six six-month long datasets.

- For each year, we manually coded a 10% sample for:
  - Aspect of vaccination
  - Vaccine comparison
  - Vaccine stance
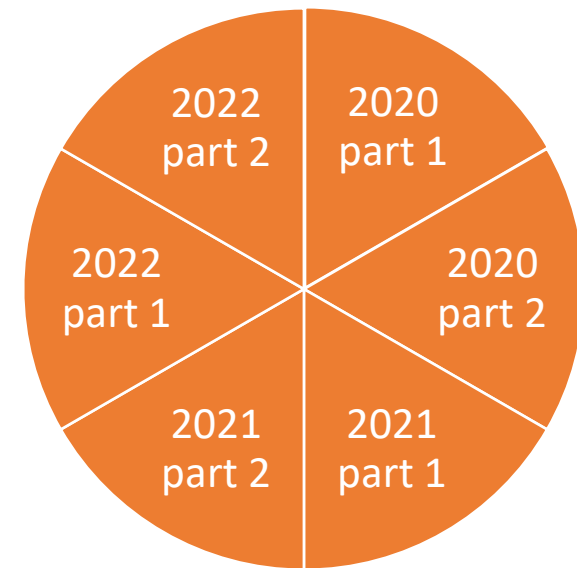
2021-2022

- Efficacy: MMR and other vaccines are superior to the Covid vaccines because the Covid vaccines do not prevent infection.

- The Covid vaccines are not 'real' vaccines; they are 'shots' like the 'flu shot'.

1. "There is a substantial difference between smallpox/polio/ mmr vaccines which actually prevent disease and the COVID and Flu shots which do NOT prevent you from getting COVID or flu."

2. "It might be acceptable if the Covid shot was a real vaccine like the Polio, whooping cough, MMR, etc. But it's not even close to offering any extended protection against Covid at all. And we now know it doesn't even impede transition of this virus. So... No thanks."

3. "If it doesn't prevent what it's supposed to, it's not a vaccine. Polio vaccine prevented polio; MMR prevents measles, mumps and rubella. COVID-19 "vaccine" prevents nothing. Buh bye."

Can metaphors help address these concerns?

Flusberg, S., Mackey, A. and Semino, E. (in press) Seatbelts and raincoats, or banks and castles: Investigating the impact of vaccine metaphors, *PLOS One*.

Raincoat metaphor

Chise 🧬 🦠 🦠 💉
@sailorrooscout

Concerning breakthrough infections. Think of the vaccine as a very effective raincoat. If it's drizzling, you'll be protected. If the rain is coming down hard, you might still be fine. But if you are going in and out of rainstorms all the time, you could end up getting wet.

12:45 PM · Jul 13, 2021 · Twitter for iPhone

Seatbelt metaphor

Teachers union President Cecily Myart-Cruz issued a supportive statement after the district announcement.

"Vaccines are like seatbelts: necessary but not invincible," Myart-Cruz said. "Just like we need seatbelts, airbags, and speed limits, we need masks, ventilation, and testing to keep school communities safe."

29th July 2021
https://www.latimes.com/california/story/2021-07-29/lausd-to-require-testing-of-students-staff-regardless-of-vaccination-status

Experiment: 300 people across three conditions

Literal stimulus

Being vaccinated is an effective way of reducing your chances of being infected with a virus. However, vaccines do not provide 100% protection, and it is still possible to become sick even after you have been vaccinated and had a booster. For example, you could get infected if were exposed to a large amount of a virus in your daily life. You could also get infected if the immune reaction caused by the vaccine has not been strong, or if a new variant develops that partly evades the vaccine. Finally, the effects of the vaccine might wane eventually. For these reasons, when there are high infection rates in your area, it is still important to take additional precautions even after vaccination, like avoiding crowded indoor spaces and wearing a face mask.

Metaphor conditions

Raincoat

Being vaccinated is an effective way of reducing your chances of being infected with a virus**, just like wearing a waterproof raincoat during a storm reduces your chances of becoming wet.** However, **even the best raincoats don't provide 100% protection from getting wet**. In the same way, vaccines don't provide 100% protection from a virus, and it is still possible to become sick even after you have been vaccinated and given a booster. For example, you could get sick if you are exposed to a large amount of the virus in your daily life, **which is like going out during a severe rainstorm.** You could also get sick if the immune reaction caused by the vaccine has not been strong or if a new variant develops that partly evades the vaccine**. This is like a raincoat not fitting you well. Also, the effects of the vaccine might wane eventually, just like a raincoat might fray, develop holes, and wear out over time**. For these reasons, when there are high infection rates in your area, it is still important to take additional precautions even after vaccination. These include avoiding crowded indoor spaces **(as you would avoid severe rainstorms)** and wearing a face mask **(like using an umbrella even though you are also wearing a raincoat).**

Seatbelt

Being vaccinated is an effective way of reducing your chances of being infected with a virus, **just like wearing a seatbelt reduces your chances of getting injured in a car crash**. However, **even the best seatbelts don't provide 100% protection from getting hurt.** In the same way, vaccines don't provide 100% protection from the virus, and it is still possible to become sick even after you have been vaccinated and given a booster. For example, you could get sick if you are exposed to a large amount of the virus in your daily life, **which is like spending a lot of time in heavy, fast traffic.** You could also get sick if the immune reaction caused by the vaccine has not been strong or if a new variant develops that partly evades the vaccine**. This is like a seatbelt not fitting you well.** Finally, the effects of the vaccine might wane eventually, **just like a seatbelt might become less effective due to age and wear and tear.** For these reasons, when there are high infection rates in your area, it is still important to take additional precautions even after vaccination. These include avoiding crowded indoor spaces **(as you would avoid reckless driving)** and wearing a face mask **(like driving a car with airbags even though you are also wearing a seatbelt).**

Main findings

- Vaccine attitudes improved (became less hesitant) in all three conditions.

- The *raincoat* metaphor was rated as more persuasive than the literal message.

- In answer to the question *How would you respond to a friend who asked why they should take a vaccine that is not 100% effective?*, the mean length of free text responses was as follows:

  - Literal: 22.8 words
  - Raincoat: 29.5 words
  - Seatbelts: 26.3 words

- In free-text responses, the *seatbelt* metaphor was re-used by 18% of participants in the seatbelt condition.
- The *raincoat* metaphor was re-used by 27% of participants in the raincoat condition, e.g:
  - "It provides a high degree of protection against you becoming seriously ill. Would you rather wear a raincoat or walk around unprotected during a thunderstorm?"

Conclusions

- Based on Twitter data, Covid-19 vaccines are compared unfavourably to the MMR vaccine and other vaccines, because they do not protect against infection.

- Some users question their status as vaccines, and describe them as 'shots'.

- Both literal and metaphorical explanatory messages involving raincoats and seatbelts may be useful to address these concerns, including in interactions with others.