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# Pro- and anti-vaccine advocacy on Twitter: An analysis of networks and discourses

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## Background

What's happening?

**Background** @background · Jun 23  
Vaccines have aroused public concerns about their safety and effectiveness, and they are debated in the mainstream media as well as on social media, especially Twitter

**Reference** @Reference  
Love et al., 2013; Witteman and Zikmund-Fisher, 2012

**Background** @background · Jun 23  
In particular, anti-vaccine movements are using the Internet and social media to potentially directly influence public risk perception toward vaccines, and persuading the audience not to vaccinate themselves and/or their children

**Reference** @Reference  
Jolley and Douglas, 2014

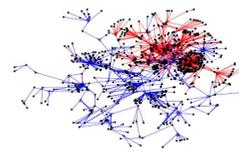
**Background** @background · Jun 23  
On Twitter, pro- and anti-vaccines users often post their messages together with images, which could enhance their visibility in the social media, and their influence on public opinion toward vaccinations

## Research questions



### ACTORS

Which types of actors share information in favour or against vaccines (i.e. activists, the media, Governmental Health Agencies, health carers, Non-Governmental Organizations, general users, etc.)?



### NETWORKS

Do these actors only communicate with people who share their opinion on vaccines, or do they reach people with contrary views?



### VISUAL REPRESENTATIONS

How do the images shared by these actors represent vaccines and vaccinations?

## Research benefits

The results obtained may contribute to the design of effective immunization campaigns on Twitter, thus addressing the anti-vaccine sentiment issue that appears to be spreading online and offline.

## Methods

### SOCIAL NETWORK ANALYSIS

To investigate how information about vaccines flows within and between pro- and anti-vaccine communities, I am analysing how Twitter users are connected in networks based on their retweets, i.e. the re-sharing of tweets (messages).

Measuring:

- Users' in-degree centrality (how many times their tweets were re-shared), I can identify which actors post the most popular (and hence visible) messages and images
- Users' betweenness centrality (the smallest number of contacts that connects two users), I can identify if there are actors that share messages and images from both anti- and pro-vaccine communities, thus linking them, and who they are
- Users' eigenvector centrality (how well connected are the few contacts of an user), I can identify which users are more connected either within or between anti- and pro-vaccine groups

### DISCOURSE ANALYSIS OF IMAGES

To investigate how anti- and pro-vaccines actors represent and communicate vaccinations visually, I am exploring and comparing the discourses of the shared anti- and pro-vaccines pictures. A discourse depicts the way vaccinations are thought (by the image producer and/or consumer) and its defined by the visual characteristics of the image.

In particular, I am analysing the following characteristics:

- Type of image - photos, comics, infographics, screenshots, etc.
- Theme - vaccine safety and effectiveness, alternative medicine, civil liberties, conspiracy theories/search for truth, morality, religion and ideology
- Subject (e.g. children, health carers, syringes, etc.) and context (tribe, hospital, home, etc.)
- Figurative elements (e.g. metaphors, symbols, stereotypes, etc.)

## References

Jolley, D. and Douglas, K.M. (2014) The effects of anti-vaccine conspiracy theories on vaccination intentions. *PLoS ONE* [online]. 9(2), p. e89177. [Accessed 11 October 2015].

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Witteman, H.O. and Zikmund-Fisher, B.J. (2012) The defining characteristics of Web 2.0 and their potential influence in the online vaccination debate. *Vaccine* [online]. 30(25), pp. 3734-3740. [Accessed 11 October 2015].

