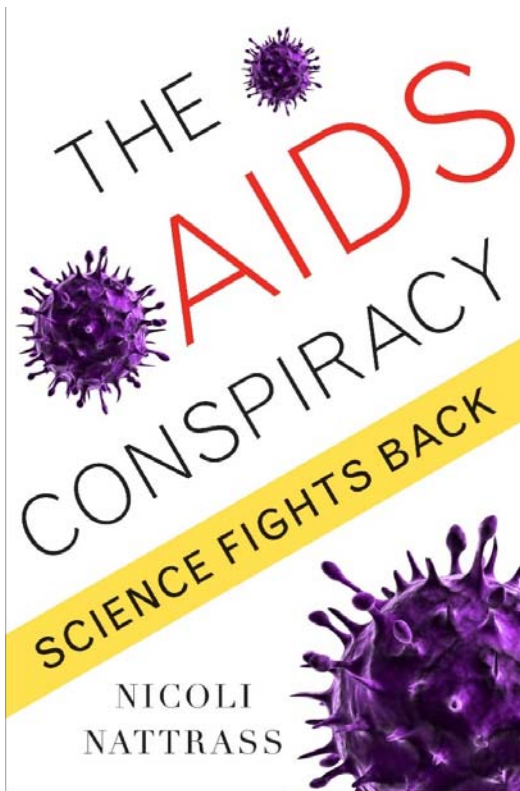


## *Fake news making a disease outbreak worse*



**Thanks for the measles yet again, Andy**

Posted by Orac on May 1, 2017

(258)

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**What do hydroxychloroquine, ibuprofen and blood type have to do with coronavirus? Looking at the COVID-19 myths causing confusion**

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ABC Health & Wellbeing

By technology reporter Ariel Bogle and Tegan Taylor

# Theoretical model

- Three diseases: norovirus, influenza, monkeypox
- Stage 1: diseases spread under conventional SEIR rules, no information influence
- Stage 2: information spreads that tells people good or bad advice. Bad advice makes them wash hands less or not socially distance. People respond to the types of advice depending on their susceptibility to believe conspiracy theories (CTs provide narratives why the good advice should be ignored)
- Stage 3: Test 2 counter-fake news strategies:
  - a) put much more good advice into circulation
  - b) make people resistant to believing bad advice, they don't share or act on it

# Some strategies to fight fake news

- Provide counter-information that is equally or better evidenced, or more persuasive
- Tax the advertising or tax the profits of products sold via misinformation
- Drown bad info with good information
- Regulate information, possibly impose civil or criminal liabilities which could lead to explicit censorship
- Revise financial models available to fake news disseminators (incentives) to stop encouraging production and sharing of false (or even just very salaciously written) stories over truth and accuracy
- Labelling (reliability rating or counter-arguments provided) by news provider
- Encourage individuals to actively strive to make their own social/filter bubbles more diverse
- 'Immunise', recipients to disregard fake news (education-based strategy)

## Parameters available from existing research

- Disease specific parameters (eg.,  $r_0$ , #generations)
- Contact rates for the UK (mean, distribution)
- How many conversations each of us have about... health, every day
- How many meaningful social contacts each of us have (Dunbar numbers, 150)
- How easily, how far and how quickly false and real stories travel on Twitter (Vosoughi et al 2017)
- How similar members of our social networks are to each other & to ourselves (homophily)
- Reciprocity: how likely it is that people who influence me, I also influence them
- How much people believe in conspiracy theories
- How consistently do people wash their hands (indicator of disease precaution)

# Model parameters

## Parameters needed

- How much *does* circulating bad advice change real behaviour?
- Do most people cling to their usual behaviours; how much do they really change behaviour if emotionally invested?
- What is the **best psychological domain to measure vulnerability** to believing and acting on bad advice (is it inclination to believe conspiracy theories or is there a better trait(s) to identify the vulnerable?)

# Outcomes to keep in mind...

## Conventional outcomes

- Resulting  $r_0$  (reproductive number)
- Peak prevalence
- Case fatality rate
- Duration of outbreak

## Other harms

- Medication/other misuse leading to harm
- Hoarding of drugs ineffective in outbreak (but needed for other purposes)
- Undermining institutions and cause social capital gains by unaccountable and disreputable groups...

## Nigerian Ebola Hoax Results in Two Deaths

*Twenty more were hospitalized after drinking excessive amounts of salt water.*

By LIZ NEPORENT

30 September 2014, 11:10 • 4 min read



## Chloroquine: Trump's misleading claims spark hoarding and overdoses

**President's comments on anti-malarial drug have led to at least one death as researchers warn against 'off-label' drug repurposing**



Address the financial motives behind spreading misinformation or *not* spreading it



Brainard J & Hunter PR. "Misinformation making a disease outbreak worse: outcomes compared for influenza, monkeypox, and norovirus." *Simulation* (2019).

Brainard J, Hunter PR & Hall IR. "An agent-based model about the effects of fake news on a norovirus outbreak." *Revue d'Épidémiologie et de Santé Publique* (2020).