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## EDITORIALS

# Information wars: tackling the threat from disinformation on vaccines

Closing down trolls, bots, and content polluters would be a start

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In April 2019, Unicef and the World Health Organization highlighted a global surge of measles.<sup>1,2</sup> There were 966 cases of measles confirmed in the United Kingdom in 2018, nearly four times as many as in 2017<sup>3</sup>; 91.2% of 2 year olds in England had been given the MMR vaccine in 2018, down from 92.7% in 2013-14,<sup>4</sup> with both rates below the 95% considered necessary to prevent transmission in the population. Those seeking an explanation have highlighted the role played by disinformation spread through social media. The English secretary of state for health, Matt Hancock, described “those promoting the antivaccine myth as having blood on their hands,” adding that he was “completely open to all options” on how to bolster vaccination rates, including making immunisations compulsory.<sup>5</sup> Vaccine hesitancy is recognised as a major challenge in many EU member states.<sup>6</sup> Although overall confidence in vaccines remains high, with 83% of respondents across all member states regarding them as safe and 88% as effective,<sup>7</sup> the figures are much lower in some states, such as Romania and Latvia.

The internet has become one of the most important sources of health related information, especially since “web 2.0” made it simple for anyone to post content online. Subsequently, social media platforms such as Facebook and Twitter have facilitated a massive increase in access to information, accurate or not. Antivaccine activists seized the opportunity.<sup>8</sup> Studies of internet content have consistently found that a substantial share of the available content on vaccination was misleading, and false messages were liked and shared more than those that were accurate.<sup>9,10</sup>

Researchers have moved on from describing the different types of content and are now using advanced techniques to identify, with increasing confidence, the sources of these messages. Vaccination has long been recognised as a common topic for disinformation on the internet and was chosen as the topic in an early competition run by the US Department of Defense to find the most effective way of identifying “influence bots.”<sup>11</sup>

## Sources of disinformation

A recent study of vaccine related posts on Twitter shed considerable light on what is a complex landscape.<sup>12</sup> It identified three broad categories of account especially likely to spread vaccine related disinformation. The first it termed Russian trolls. Trolls are people who conceal their identity to post false accusations or inflammatory remarks, often sponsored or coordinated by an organisation. Many of those identified were associated with the Russian Internet Research Agency, which has also been implicated in messaging in the 2016 US presidential election and the UK EU referendum.<sup>13</sup> These accounts, many using the hashtag #VaccinateUS, spread messages both for and against vaccination, seemingly designed to create discord and undermine trust in authority. Thus, they included messages rarely found elsewhere, linking vaccines to issues that are especially divisive in the US, such as race and religion, or the idea that vaccination is a conspiracy by the elite.

A second source is sophisticated bots, which are automated accounts that promote particular content, although some also have some human participation that makes them hard to identify using algorithms. These also contained a mix of messages for and against vaccines. The third, characterised by antivaccine messages that seem designed to stimulate curiosity, comprise “content polluters,” devised to spread malware or unsolicited commercial content and to direct readers to sites that generate income.

## Fighting back

So what can be done? Vaccination rates above 90% are testimony to the efforts of community nurses and doctors whose knowledge is still respected and whose guidance is followed by most parents.<sup>7</sup> Vaccine hesitancy is a natural response for any parent, and explaining the benefits is essential. The personal example of health professionals giving their children vaccines can be compelling.

Those responsible for vaccination programmes must ensure they have a detailed understanding of knowledge and beliefs in their

populations<sup>14</sup> and employ much more sophisticated messages, recognising that many traditional ones can backfire and reduce the likelihood that those already sceptical will support vaccination.<sup>15</sup> They should draw on a growing body of research, some in related fields such as climate change,<sup>16</sup> on confronting disinformation. It is important not to overcomplicate messages or repeat erroneous ones, even to correct them<sup>14</sup>; “inoculating” the public with the facts before disinformation takes hold may be effective.<sup>17</sup>

We also need a much better understanding of who is behind the growing volume of internet traffic on vaccination, exploiting methodological advances in network analysis and artificial intelligence<sup>18</sup> and engaging with social media companies to reduce it. Twitter has already deleted millions of suspicious accounts.<sup>19</sup> In addition, legal measures should be considered. The UK government proposes the toughest internet safety regulation in the world<sup>20</sup>; might a public health protection clause be possible, to withdraw flagrantly dangerous messages? The secretary of state says he has not ruled out any options, one of which must be the US approach, with vaccination a condition for school entry.<sup>21</sup> It will be less onerous to implement than when first proposed in the UK in 1985.<sup>22</sup>

Those involved in the battle against infectious disease understand that they must always strive to be one step ahead of constantly evolving microorganisms. Exactly the same principle applies in what is now a rapidly evolving information environment.

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