How and Why Did Misinformation Become a Problem in Medicine?

Dr. Gerald Lee, MD, FACAAI
Associate Professor of Pediatrics
Children’s Healthcare of Atlanta
Emory University School of Medicine

Disclosures

No relevant disclosures
Learning Objectives

By the end of this presentation, the learner will

1. Recognize the importance of misinformation in promoting vaccine hesitancy
2. Identify ways that social media platforms promote the dissemination of misinformation

Oct 2021: new reported COVID cases are declining...

COVID vaccinations continue to increase…

…but many do not intend to get vaccinated

Over Seven In Ten Adults Now Report Being Vaccinated For COVID-19

Have you personally received at least one dose of the COVID-19 vaccine, or not? As you may know, an FDA-authorized vaccine for COVID-19 is now available for free to all adults in the U.S. Do you think you will…?

<table>
<thead>
<tr>
<th>Month</th>
<th>Already gotten</th>
<th>As soon as possible</th>
<th>Wait and see</th>
<th>Only if required</th>
<th>Definitely not</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sep 2021</td>
<td>77%</td>
<td>10%</td>
<td>7%</td>
<td>12%</td>
<td>11%</td>
</tr>
<tr>
<td>Jul 2021</td>
<td>67%</td>
<td>13%</td>
<td>9%</td>
<td>12%</td>
<td>14%</td>
</tr>
<tr>
<td>Jun 2021</td>
<td>65%</td>
<td>10%</td>
<td>15%</td>
<td>7%</td>
<td>14%</td>
</tr>
<tr>
<td>May 2021</td>
<td>62%</td>
<td>12%</td>
<td>14%</td>
<td>7%</td>
<td>13%</td>
</tr>
<tr>
<td>Apr 2021</td>
<td>56%</td>
<td>10%</td>
<td>15%</td>
<td>7%</td>
<td>14%</td>
</tr>
<tr>
<td>Mar 2021</td>
<td>56%</td>
<td>15%</td>
<td>17%</td>
<td>7%</td>
<td>13%</td>
</tr>
<tr>
<td>Feb 2021</td>
<td>48%</td>
<td>30%</td>
<td>17%</td>
<td>7%</td>
<td>13%</td>
</tr>
<tr>
<td>Jan 2021</td>
<td>41%</td>
<td>31%</td>
<td>22%</td>
<td>7%</td>
<td>15%</td>
</tr>
<tr>
<td>Dec 2020</td>
<td>34%</td>
<td>29%</td>
<td>22%</td>
<td>7%</td>
<td>16%</td>
</tr>
</tbody>
</table>

NOTE: December 2020 survey did not have an option for respondents to indicate they had already been vaccinated. Jan-Apr 2021 question wording: “When an FDA-authorized vaccine for COVID-19 is available to you for free, do you think you will…?” See top of page for full question wording.

SOURCE: KFF COVID-19 Vaccine Monitor • Download PDF
Half of unvaccinated adults feel the vaccine is a bigger risk than the coronavirus

<table>
<thead>
<tr>
<th></th>
<th>Total Vaccinated</th>
<th>Total Unvaccinated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Becoming infected is a bigger risk</td>
<td>88%</td>
<td>34%</td>
</tr>
<tr>
<td>Getting the vaccine is a bigger risk</td>
<td>7%</td>
<td>53%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>5%</td>
<td>11%</td>
</tr>
</tbody>
</table>

NOTE: See topline for full question wording.
SOURCE: KFF COVID-19 Vaccine Monitor (July 15-27, 2021) • Download PNG
Half of unvaccinated adults feel the vaccine is a bigger risk than the coronavirus

Which of the following do you think would be a bigger risk to your health? Becoming infected with coronavirus or getting the COVID-19 vaccine?

<table>
<thead>
<tr>
<th></th>
<th>Total Vaccinated</th>
<th>Total Unvaccinated</th>
<th>Wait and see</th>
<th>Definitely not</th>
</tr>
</thead>
<tbody>
<tr>
<td>Becoming infected is a bigger risk</td>
<td>88%</td>
<td>34%</td>
<td>50%</td>
<td>14%</td>
</tr>
<tr>
<td>Getting the vaccine is a bigger risk</td>
<td>7%</td>
<td>53%</td>
<td>34%</td>
<td>75%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>5%</td>
<td>11%</td>
<td>15%</td>
<td>9%</td>
</tr>
</tbody>
</table>

NOTE: See topline for full question wording.

In 2020, COVID-19 was the third leading cause of death in the U.S.*

PROVISIONAL 2020 DEATHS

1. Heart Disease 690K
2. Cancer 598K
3. COVID-19 345K

Serious adverse events after COVID vaccination are rare

Anaphylaxis after mRNA COVID vaccines:
• 5.0 per million doses administered

Myocarditis after mRNA vaccine
• 14-19 excess cases per million doses (chart confirmed data)

Deaths reported to VAERS (not necessarily causal)
• 8,878 / 408 million (0.0022%)
Why do people fear the vaccine more than the virus?

Which of the following do you think would be a bigger risk to your health? Becoming infected with coronavirus or getting the COVID-19 vaccine?

<table>
<thead>
<tr>
<th>Risk Assessment</th>
<th>Total Vaccinated</th>
<th>Total Unvaccinated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Becoming infected is a bigger risk</td>
<td>88%</td>
<td>34%</td>
</tr>
<tr>
<td>Getting the vaccine is a bigger risk</td>
<td>7%</td>
<td>53%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>5%</td>
<td>11%</td>
</tr>
</tbody>
</table>

NOTE: See topline for full question wording.
SOURCE: KFF COVID-19 Vaccine Monitor (July 15-27, 2021) • Download PNG

Barda et al. NEJM 2021;385:1078-90
Scientists have expressed doubts over the effectiveness of a coronavirus vaccine that has been rushed to human trials, after all of the monkeys used in initial testing later contracted coronavirus.

Experts suggest £90 million Oxford University Coronavirus ... All the monkeys in the trials went on to get the virus.

The new vaccine for Covid-19 will be the first of its kind EVER. It will be an mRNA vaccine which will literally alter your DNA. It will wrap itself into your system. You will essentially become a genetically modified human being.
UK GlaxoSmithKline whistleblower states the antigens in the upcoming covid vaccine are proven to cause infertility in up to 97% of recipients.


False information spreads widely through social networks

Measuring the impact of COVID-19 vaccine misinformation on vaccination intent in the UK and USA

Sahil Loomba1, Alexandre de Figueiredo2,3, Simon J. Piatek4, Kristen de Graaf5 and Heidi J. Larson2,4,5,6

RCT to quantify how online misinformation affects intent to vaccinate


Social media has increased in the past decade


PEW RESEARCH CENTER
Seven-in-ten Facebook users say they visit site daily

Among U.S. adults who say they use Facebook, % who use that site daily:

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Several times a day</th>
<th>About once a day</th>
<th>Less frequently</th>
<th>NET Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facebook</td>
<td>49</td>
<td>22</td>
<td>29</td>
<td>70</td>
</tr>
<tr>
<td>Snapchat</td>
<td>45</td>
<td>14</td>
<td>40</td>
<td>59</td>
</tr>
<tr>
<td>Instagram</td>
<td>38</td>
<td>21</td>
<td>41</td>
<td>59</td>
</tr>
<tr>
<td>YouTube</td>
<td>36</td>
<td>18</td>
<td>45</td>
<td>54</td>
</tr>
<tr>
<td>Twitter</td>
<td>30</td>
<td>16</td>
<td>53</td>
<td>46</td>
</tr>
</tbody>
</table>

Note: Respondents who did not give an answer are not shown. “Less frequently” category includes users who visit these sites a few times a week, every few weeks or less often.
“Social Media Use in 2021”

PEW RESEARCH CENTER

Nearly 80% of Americans who regularly get news on Snapchat and on TikTok view social media as an important way of getting vaccine news

% of Americans that regularly get news on ___ who say that social media is an important way of keeping up with news about COVID-19 vaccines

<table>
<thead>
<tr>
<th>Platform</th>
<th>% of Americans</th>
<th>% of U.S. adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snapchat</td>
<td>79%</td>
<td>4%</td>
</tr>
<tr>
<td>TikTok</td>
<td>77%</td>
<td>6%</td>
</tr>
<tr>
<td>Instagram</td>
<td>75%</td>
<td>11%</td>
</tr>
<tr>
<td>Twitter</td>
<td>71%</td>
<td>13%</td>
</tr>
<tr>
<td>Facebook</td>
<td>67%</td>
<td>31%</td>
</tr>
<tr>
<td>LinkedIn</td>
<td>66%</td>
<td>4%</td>
</tr>
<tr>
<td>YouTube</td>
<td>61%</td>
<td>22%</td>
</tr>
<tr>
<td>Reddit</td>
<td>60%</td>
<td>7%</td>
</tr>
</tbody>
</table>

Note: Twitch and WhatsApp not shown due to insufficient sample sizes.
Source: Survey conducted July 26-Aug. 8, 2021.

PEW RESEARCH CENTER
Trustworthiness depends on the source and your “gut” feeling

Top 3 factors U.S. adults say is a very important in deciding whether a news story is trustworthy:

1. The news organization – 50%
2. The sources cited – 47%
3. Their gut instinct – 30%
“Speak for yourself. My husband, myself, family, friends, read books all. the. time.”

“Tens of millions of Americans have a computer in their pocket more powerful than a desktop computer from the 90’s. What do we do with them? Take pictures and play video games. It’s the human condition.”

“There’s no time to read when you are watching all that reality tv and biased ‘news’ shows. News isn’t supposed to be a ‘show’. It is just supposed to be news. That doesn’t exist anymore.”

Why do we like, comment and share inaccurate or unproven information on social media?
Raise your hand if you already heard of this April fool’s joke!

---

**Dual-Process theory**

Humans make decisions through 2 processes:

**System 1 – Unconscious (gut)**
- rapid, efficient, based on experiences
- **Emotional**, prone to bias

**System 2 – Conscious (analytic)**
- slow, inefficient, based on rules and logic
- **Rational**, less prone to error
Content sharing is not necessarily related to its accuracy

Randomized trial comparing 2 groups viewing 15 true and 15 false headlines regarding COVID 19:

Group 1: Accuracy
“To the best of your knowledge, is the claim in the above headline accurate?”

Group 2: Sharing
“Would you consider sharing this story online (for example, through Facebook or Twitter)?”

Content sharing is not necessarily related to its accuracy

An “accuracy nudge” can reduce sharing of false headlines

An intervention trial asked participants to rate the accuracy of a headline before asking about intent to share true/false headlines


An “accuracy nudge” can reduce sharing of false headlines

There is a 50% reduction in the sharing of false headlines when participants are asked the rate accuracy first

Inattention is the most prevalent reason for sharing of false content


Inattention (51%)
- Forgetting to consider accuracy → attention focused on social media metrics: gaining/pleasing followers, engagement, signaling group membership

Confusion (33%)
- Mistakenly believing the news

Purposeful (16%)
- Deliberate sharing of falsehoods
Inattention is the most prevalent reason for sharing of false content

Social media algorithms have promoted content which elicit emotional responses

Social media algorithms have promoted content which elicit emotional responses

To combat a decline in engagement, Facebook implemented a new algorithm called MSI: “Meaning Social Interactions”

Posts with more points are placed in the newsfeed rather than in chronological order

“Likes” are worth 1 point and another “reactions” are 5 points


Social media algorithms have promoted content which elicit emotional responses

Posts eliciting emotional reactions are “promoted” in the NewsFeed

Social media algorithms have promoted content which elicit emotional responses

Posts eliciting emotional reactions are “promoted” in the NewsFeed

Arguments that trigger long comment posts also further promote these posts

Content creators rely on negative posts to get exposure to newsfeeds

Source: April 2019 internal report titled ‘Political Party Response to ’18 Algorithm Change’

Antivaccine activists were able to disseminate COVID misinformation utilizing these algorithms

According to leaked documents:

• 5% of posters on Facebook created 50% of all posts on COVID misinformation Facebook groups
• Facebook employees found that anti-vaccine comments were overrepresented (~2/3 of comments) and were promoted by the platform
• Systems to detect vaccine hesitant comments were poor in English and “nonexistent” in other languages

Source: Internal report titled ‘Identifying and Comparing Pro- and Anti-COVID-19 Vaccine Comments’

Summary

- A significant proportion of the population obtains health information from social media
- Misinformation can increase vaccine hesitancy
- Misinformation spreads effectively through social media
  - Users share misinformation without considering accuracy
  - Social media algorithms promote content that elicit emotional responses
  - This amplification allows a small number of activists to significant influence

Where do we go from here?
Communicating About Vaccines in a Fact-Resistant World

The continued success of vaccines, one of the most effective public health interventions, depends on high rates of acceptance. Vaccine refusal in the United States has increased since the late 1990s. This trend has coincided with an increase in vaccine safety concerns. Such concerns result from easy recall of adverse events, misinformation, and human tendency to poorly judge probabilities. When a significant proportion of the US population is impervious to scientific facts, such as belief in human-induced climate change, it is difficult to communicate vaccine-related information to patients.

Parent-physician communication in such conditions is challenging. If, as is often the case, patient-autonomous decision making is insufficient, physicians have a moral and professional duty to compensate for this with modeled and proscribed communication. The continued success of vaccines, one of the most effective public health interventions, depends on high rates of acceptance. Vaccine refusal in the United States has increased since the late 1990s. This trend has coincided with an increase in vaccine safety concerns. Such concerns result from easy recall of adverse events, misinformation, and human tendency to poorly judge probabilities. When a significant proportion of the US population is impervious to scientific facts, such as belief in human-induced climate change, it is difficult to communicate vaccine-related information to patients.

Counter-communicating to anxious and misinformation-impervious patients is challenging. If, as is often the case, patient-autonomous decision making is insufficient, physicians have a moral and professional duty to compensate for this with modeled and proscribed communication.
A Communication Guide for Clinicians on the COVID-19 Vaccine

https://yale.cloud-cme.com/course/courseoverview?P=0&EID=24141