
APRIL 2023

A PGN ANALYSIS

The call is coming from inside the house

U.S. misinformation agents fuel global vaccine opposition

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About PGN

PGN (Public Good News) is a nonprofit newsroom that partners with trusted local voices throughout the U.S. to distribute accurate, accessible, and inclusive health news in English and Spanish. We do this by:

1. Leveraging the Monitoring Lab of PGN's parent organization, PGP, to decipher what health misinformation is spreading, where, and by whom. We then use this data to inform the questions we ask in our reporting.
2. Partnering with our industry colleagues in newsrooms around the country to distribute and republish real-time health news broadly.
3. Joining forces with community-based organizations to provide them with health news in multiple languages and formats, host listening sessions to prioritize their information needs, and create a feedback loop for community voices.

In addition to our explanatory news articles and features, PGN publishes reports and articles that analyze the spread and impact of misinformation and disinformation on communities.

You can contact PGN at info@publicgoodnews.com.

About PGP

PGP (The Public Good Projects) is a public health nonprofit specializing in large-scale media monitoring programs, social and behavior change interventions, and cross-sector initiatives.

Acknowledgements

This report is made possible by general support to PGN. No direct sponsorship contributed to this report.

Foreword

For six years, PGP's Monitoring Lab has monitored public media data, collecting insights on the most pressing public health topics, including the opioid epidemic, mental health, sexual and reproductive health, nutrition, school wellness, tobacco products, gun violence, outbreaks and pandemics, and vaccines. But vaccines have special standing. When PGP created North America's largest vaccine misinformation monitoring program in 2019, it tried to mobilize public health and its allies against what was already a well-funded and highly organized global network of vaccine opponents. In mid-2020, PGP co-founded a United Nations global vaccination demand program that helped Country Offices respond to vaccine misinformation. Running these two programs in parallel granted PGP unique visibility into global vaccine discourse. For four years, PGP's analysts watched the anti-vaccine movement evolve within the U.S., and for three, they have seen how misinformation and disinformation travel through global social networks. In 2022, PGP launched PGN to partner with trusted local voices and combat the spread of misinformation in communities.

Today's vaccine opposition landscape is unrecognizable compared to the pre-pandemic period. More vaccine misinformation reaches more people at a faster rate than ever before. Recognition of a problem may be the first step toward solving it. Since the pandemic began, the White House's [National Security Strategy](#) referenced misinformation as a driver of polarization, the U.S. surgeon general issued an [Advisory](#) on misinformation, and the CDC and FDA tasked multiple media monitoring teams with tackling the problem. Numerous state and local health departments have also taken on "infodemic management," training professionals in social listening and anti-misinformation tactics. Congress has even attempted to hold social media companies and their executives to account for their misinformation policies. And yet the problem persists.

This report is titled "The Call Is Coming From Inside the House," a line popularized by horror movies meaning the villain already controls the space you thought was safest—your home. The U.S. creates and spreads most of the world's vaccine misinformation and disinformation. Reporting to date has focused on the smoke but largely missed the fire. The many urgent calls to address the global infodemic skirt around the primary source of the problem: Vaccine misinformation is now a chief export of the U.S., benefiting from decades of unchecked anti-vaccine organizing, the ease with which many Americans can create compelling media, and the unrivaled influence of the U.S. on global media.

There are no easy solutions. In the U.S., it is imperative to address far-right science denialism. Political affiliation is now a key indicator of a person's support for vaccines. More than [four in 10 Republicans](#) now oppose schools requiring children to get vaccinated for measles and other illnesses, demonstrating a growing distrust of vaccines and the [health experts](#) who advocate for them. This fact has crippled an effective domestic response. How do we combat the erosion of trust in government authorities when progenitors of misinformation are increasingly members of government? While health care professionals have kept their status as highly [trusted messengers](#), the field now includes members who spread misinformation to millions of people and undermine science.

Social media companies have rolled out numerous product updates and cross-sector initiatives, some of which PGP has been at the center of, but attempts to combat misinformation have had limited success. The teams at social media companies responsible for monitoring misinformation on their platforms must be better resourced and significantly more empowered to make decisions. Ultimately, senior leadership at these companies require a fundamental reset in their understanding of health misinformation and its far-reaching consequences.

Diseases don't respect national boundaries, and neither does misinformation. While it's true that every nation has seen a rise in vaccine misinformation, this report provides evidence that the U.S. is predominantly responsible for the rise in vaccine misinformation everywhere else. International efforts to increase vaccination demand must hold the U.S. accountable, but the accountability starts domestically. The inability of the U.S. to get its own house in order has become everyone else's problem. Public health, global health, and political leaders must bring to bear what soft power they can to assist the U.S. in correcting its course. America's vaccine misinformation travels to even the most remote corners of the globe, delivering anti-science rhetoric to everyday people. A talking point created by a prominent American vaccine opponent takes on new life as it spreads. It transforms itself to reflect local contexts. It exploits understandable concerns and questions about vaccines and health authorities. It makes victims out of internet users and is weaponized by bad actors. Global health security is at risk.

Executive summary

THE U.S. IS TO BLAME

A majority of negative attitudes about vaccines, or vaccine opposition, originate in the U.S. and other English-speaking countries. Instances of misinformation in the U.S. cause a global ripple effect that impacts vaccine conversations worldwide.

A prominent example of U.S. influence on global vaccine narratives is Florida's surgeon general. He has been a major driver of vaccine misinformation and opposition on a national and global scale.

VACCINE MISINFORMATION IS WORSE

Over the last two years, conversations about vaccines have increasingly been inundated with misinformation and opposition. Our analysis suggests that COVID-19 vaccine conversations have a higher proportion of opposition, followed by human papillomavirus (HPV) and polio vaccines. Respiratory syncytial virus (RSV) vaccines, which are being considered for FDA approval, have seen the largest increase in online vaccine opposition. The trend is expected to continue.

Vaccine opposition has worsened on Twitter, a primary breeding ground for misinformation, in the months since Elon Musk's takeover of the platform.

TOP 20

We've identified 20 key social media accounts driving online vaccine opposition. These authors of vaccine misinformation are disproportionately health care professionals and journalists.

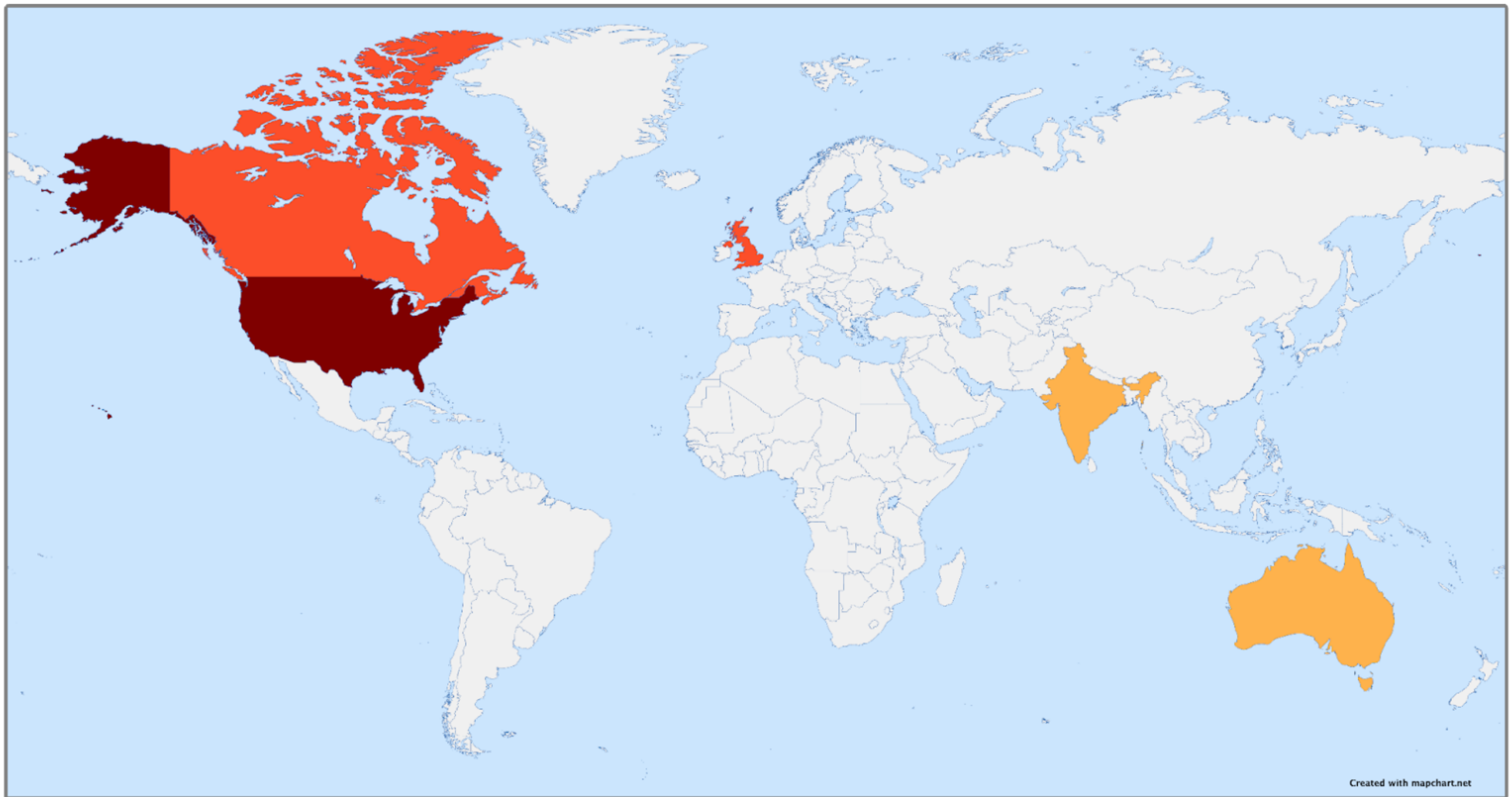
More than a third of the top vaccine opposition authors are physicians or nurses, while another 40 percent identify as journalists or news media-affiliated.

Three-quarters of the most widely shared vaccine opposition links are for right-leaning news sites or independent blogs, and 70 percent focus on alleged vaccine side effects and deaths.

A fifth of the vaccine opposition authors were suspended by Twitter for violating the platform's misinformation policy, only to be reinstated under Musk.

Over 70 percent of vaccine opposition originates from the U.S.

Between March 2022 and March 2023, 71 percent of all English- and Spanish-language vaccine opposition and misinformation online originated in the U.S. Other countries with English speakers (Canada, the U.K., Australia, and India) make up the top five vaccine opposition sources and account for more than 90 percent of opposition content.



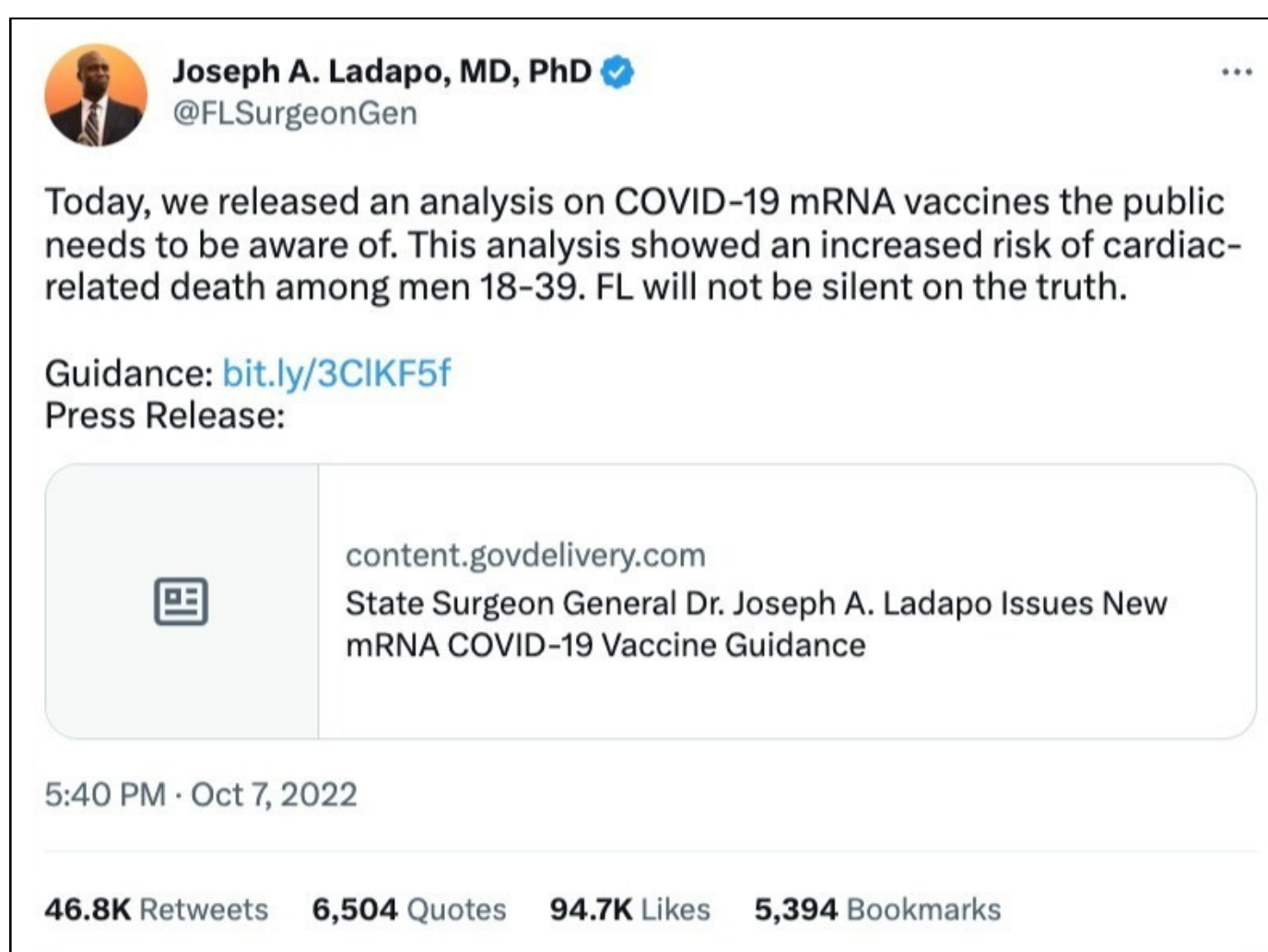
A total of 93 other countries and territories globally were sources of opposition, including 34 in Europe, 31 in Asia, nine in North America, nine in Africa, six in South America, and four in Oceania. With the exception of Pakistan, which was the origin of 1 percent of vaccine opposition content, all produced less than 1 percent of opposition content.

Between April 2022 and April 2023, 11 of the top 20 most mentioned vaccine opposition links were from U.S. websites, while six were from Canada. An article on the U.S.-based site News Punch had the highest number of mentions at 71,229. The Florida surgeon general's updated mRNA vaccine guidance—covered in more detail in the next section—posted on the Florida Department of Health (DOH) website in October 2022 was the second highest at 50,999. It was the only official government site to make the top 20 list. Please note that this analysis only includes data that can be geolocated, which includes approximately 70 percent of all data tracked by PGP.

Florida surgeon general fueled a wave of vaccine opposition

In March 2023, the CDC and FDA sent a **letter** to Florida Surgeon General Dr. Joseph Ladapo, warning that his misleading and inaccurate statements about COVID-19 vaccine safety could be harmful to the public. Although the exchange made international headlines, it wasn't the first time the state official caused controversy or promoted vaccine misinformation.

In March 2022, Ladapo contradicted federal and international public health leaders by **advising** against COVID-19 vaccination for healthy children. Just a few months later, he set off a global wave of misinformation with the release of **official guidance** recommending that men ages 18 to 39 not receive mRNA COVID-19 vaccines. The guidance was based on a **flawed**, non-peer-reviewed report by the Florida DOH that found an increased risk of myocarditis in young men following vaccination. Experts heavily criticized the report, which has since **come under fire** for reportedly excluding data showing that COVID-19 infection increases the risk of cardiac issues far more than vaccination.



A tweet published by Ladapo on October 7, 2022, sharing the mRNA vaccine guidance and the Florida DOH analysis received significantly more global engagement than any of his posts to date. This section of our report explores the impact of this single tweet on vaccine misinformation and opposition in global vaccine conversations. Our analysis includes global engagement, mentions, and online conversations in English and Spanish related to the tweet, guidance, and the Florida DOH myocarditis report.

Screenshot of the Florida surgeon general's Oct. 7 tweet that sparked a global misinformation wave.

Post engagements and direct shares

As of March 28, 2023, the tweet has over 158,000 engagements, including more than 47,000 retweets, 6,500 quote tweets, and 4,800 comments. The tweet indirectly linked to the Florida DOH's myocarditis study and was **temporarily removed** for violating Twitter's now-defunct COVID-19 misinformation policy before being restored. In the aftermath of the tweet, Ladapo's Twitter account **gained** 41,586 followers, compared to between 3,000 and 9,000 gained in previous months.

Around 85 percent of all retweets were from U.S. accounts, with a further 6 percent from the U.K. and Canada combined. The post began gaining traction in the U.S., Canada, the U.K., Spain, and Italy the day after it was published before spreading to Australia, Western Europe, South America, and South and Southeast Asia. Within days of posting, the tweet was circulating in dozens of countries across six continents. Within the U.S., the post was shared in all but two states (Wyoming and North Dakota), with a majority of the engagement concentrated in Florida (17%), Texas (11%), California (9%), New York (6%), Ohio (4%), and Georgia (4%).

English- and Spanish-language conversations about Ladapo's post

We next analyzed mentions in English or Spanish of the Florida surgeon general, by name or title, in conversations about vaccine hesitancy or opposition. In the months leading up to the guidance announcement, the Florida surgeon general was only occasionally mentioned in English-language tweets about vaccine hesitancy, with small spikes corresponding with previous controversial guidance. The October tweet caused a massive spike, peaking at over 100,000 mentions of the official in a single day. It took over a month for mentions to return to pre-announcement levels, and they have been consistently higher in the months since the tweet.

By December, mentions of the announcement had decreased, and conversations had shifted to the study that prompted the Florida surgeon general's guidance and the announcement tweet's temporary removal from the platform. Conversations related to the Florida surgeon general predominantly occurred on Twitter, as opposed to other social media platforms, in the three months following the tweet. One exception is an [Instagram post](#) by a popular promoter of vaccine opposition on multiple platforms. The post received over 138,000 likes and 2,000 replies.

Initially, mentions in Spanish followed a similar trend as ones in English, with a large, sustained peak in October. However, unlike in English, Spanish-language vaccine opposition posts showed three unique spikes in mentions of the Florida surgeon general—in October, early November, and late November. All spikes were directly related to the announcement rather than reactions to the guidance or the removal of the Florida surgeon general's tweet.

Global circulation of Florida's flawed myocarditis report

To better understand the circulation of the Florida DOH's controversial myocarditis report following the Florida surgeon general's announcement, we reviewed global mentions of the report beyond direct shares of Ladapo's tweet. As of March 28, 2023, the report has been shared approximately 244,000 times, with around 13 percent of those shares happening outside the U.S. Circulation of the report peaked in October shortly after the tweet was posted and declined faster than shares of the tweet. However, the report began recirculating in January, spiking in response to the highly publicized cardiac arrest of NFL player Damar Hamlin and a viral video from the lead author of a "reanalysis" of the vaccine clinical trial data cited in the Florida DOH guidance. In February, there was another small spike in mentions of the study after a popular anti-vaccine account shared the tweet.

The report had nine main promoters beyond the Florida surgeon general, including six U.S.-based, two U.K.-based, and one Canada-based account. A far-right political activist shared the report the day after Ladapo in a post that has been retweeted or quote-tweeted over 21,000 times. A conservative internet personality tweeted about the removal of the Florida surgeon general's tweet in a post that has been shared over 10,000 times.

One of the most prolific anonymous promoters of vaccine opposition on Twitter shared a video about the report twice in February 2023, reigniting its circulation. The two posts were shared over 8,500 times, and the video was viewed over 220,000 times. Prominent vaccine skeptic and 2024 presidential candidate [Robert F. Kennedy Jr.](#) (@robertkennedyjr) and U.S. Congressman [Thomas Massie](#) (@repthomasmassie) also posted about the report.

The main driver of circulation of the report outside of the U.S. was a U.K.-based physician. His tweet, posted the day after the Florida surgeon general's, caused a spike in global mentions, particularly in Canada, the U.K., and Australia. Around 68 percent of the retweets were from outside of the U.S. Other drivers of global circulation were Canada- and U.K.-based vaccine skeptic journalists, who posted about the report, and Twitter's removal of the Florida surgeon general's tweet, three times, with around a quarter of shares from outside the U.S.

In Spanish-language posts, data from the report was mentioned approximately 32,000 times. Notably, conversations about cardiac incidents in young men began earlier in Spanish than in English-language posts. Over a fifth of the shares came from Argentina, and 18 percent each were from Spain and the U.S. The report was shared over 1,000 times in Chile, Venezuela, and Peru in total. Although there were fewer global Spanish-language mentions, they peaked more frequently and with greater persistence than the English-language mentions.

The impact of the Florida DOH's report on the broader cardiac incidents and deaths conversation

Beyond the hundreds of thousands of retweets or shares, the Florida DOH myocarditis report impacted online conversation about alleged cardiac incidents and deaths more broadly. We also saw an impact on broader conversations about myocarditis and pericarditis.

In October, our analysis found a large spike in conversations about cardiac incidents that extended for several weeks after the Florida surgeon general's tweet. Posts related to cardiac incidents increased from an average of 12,700 weekly posts in the six months before the tweet to 35,600 weekly posts in the six months after.

A second, larger spike appeared in January, driven primarily by a viral video of a U.S.-based physician calling for a ban on COVID-19 vaccines due to evidence they cause sudden cardiac death. A video shared by this physician was viewed over 2.2 million times. This spike in posts about cardiac incidents was bolstered by conversations about athlete deaths and Damar Hamlin's collapse during a live televised football game on January 2. Cardiac incidents were the leading theme in global vaccine hesitancy conversations, with nearly 8 million English-language mentions, making up 7 percent of total posts.

Misinformation and opposition consume a growing part of vaccine conversations

Over the last two years, hesitancy and opposition have increasingly flooded vaccine conversations. From March 2022 to March 2023, 6.9 percent of all conversations about vaccines referenced opposition or misinformation, compared to only 2.5 percent between March 2021 and March 2022. If that increase seems insubstantial, note that this translates to billions of views of vaccine misinformation, and this upward trend is continuing.

Unsurprisingly, conversations about COVID-19 vaccines have the highest proportion of opposition and misinformation. Hesitancy is referenced in around 5 percent of conversations about HPV and polio vaccines. These proportions have remained fairly consistent over time. HPV vaccine opposition spikes occasionally, typically fueled by posts from known anti-vaccine accounts. Most of the misinformation about HPV vaccines is related to safety risks and unfounded concerns about the vaccine increasing sexual activity. Polio vaccine misinformation and opposition spike intermittently, typically related to outbreaks and concerns about the safety or effectiveness of the vaccine.

The vaccines with the largest recent increase in opposition conversations are RSV vaccines. RSV is a common virus that causes millions of upper respiratory infections annually, including serious illnesses in infants and older adults. Currently, no RSV vaccine is available, although several are in clinical trials, and at least one is likely to be approved this year. Most misinformation and opposition began circulating in October 2022 when the anti-vaccine group Informed Consent Action Network [published an article](#) falsely linking rising pediatric RSV cases to COVID-19 vaccines. Prior to the article, misinformation about RSV was virtually nonexistent in online conversations. Hesitancy and opposition related to [RSV vaccines](#) will likely rise as conversations about the vaccine's approval increase.

Vaccine opposition on Twitter has flourished since Musk's takeover

Notably, vaccine opposition on Twitter has increased since Elon Musk took over the platform on October 27, 2022. In the six months prior to the takeover, the platform averaged 17,940 vaccine opposition posts per day. That number rose to an average of 39,569 posts per day in the six months after Musk's takeover. In the pre-Musk period, the largest spike in vaccine opposition was related to the release of Pfizer documents in May and October 2022. The period after Musk's takeover is characterized by higher and more frequent spikes in opposition, with the largest spikes following the end of Twitter's COVID-19 misinformation policy.

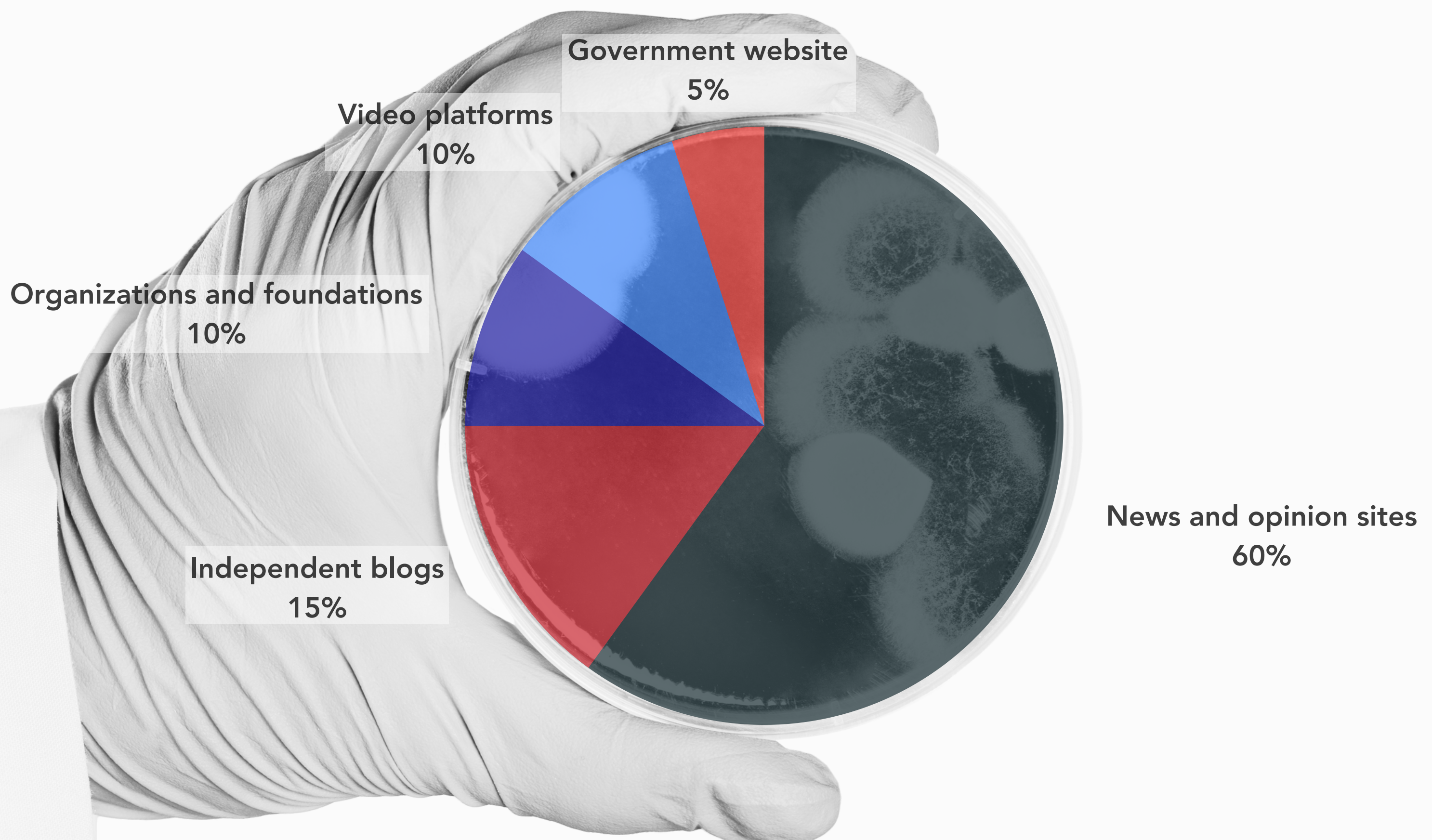
The top vaccine opposition authors are health care professionals and journalists

Thousands of accounts circulate vaccine opposition, but a handful of large accounts generate the most high-impact content. This section explores the top 20 authors of vaccine opposition and misinformation. To identify the authors, we assessed their follower count, total engagement, and mentions in conversations related to vaccine opposition. Of the top 20, 40 percent are journalists or work in media, 35 percent are health care workers—including five physicians and one nurse—and 10 percent identify as entrepreneurs. One politician, Republican Congressman Thomas Massie, was among the 20 authors.

As home to 17 of the 20 authors, Twitter again proved to be a leading source of vaccine opposition. Two of the authors are on Instagram, and one is on Facebook. Most of the top authors are long-standing promoters of misinformation. Only 20 percent of the top author accounts were created in the last two years. Four top vaccine opposition authors were suspended on Twitter for violating the COVID-19 misinformation policy. All were reinstated after Elon Musk acquired Twitter.

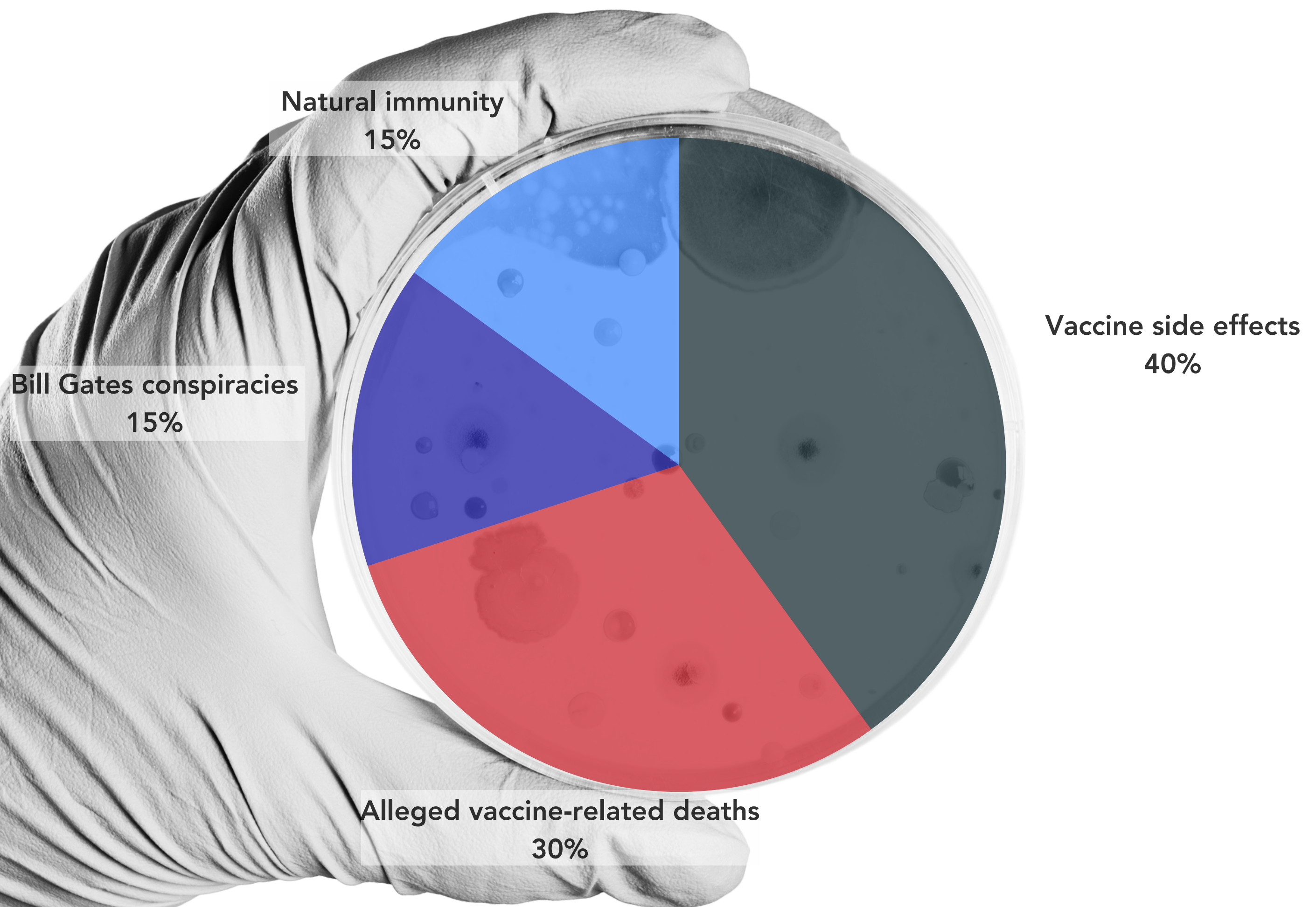
We also analyzed the top vaccine opposition links shared and the top vaccine opposition websites viewed on social media. Top links included blog posts, news or opinion articles, or videos widely shared or mentioned on social media over the past year. For example, the top link was a **hoax story** falsely claiming that the Japanese government launched an official investigation into COVID-19 vaccine deaths, published on a U.S.-based conspiracy site. Fifteen of the top links were right-leaning news, opinion, or blog sites, two were video platforms, and two were anti-vaccine organizations. The Florida surgeon general's October guidance was the only top link from an official government website.

Top vaccine opposition links (March 2022 - March 2023)



For this analysis, top websites include the most frequently mentioned sites in vaccine opposition conversations. These are not specific to an individual article or publication. The top vaccine opposition website in the last year was a blog run by one of the top 20 vaccine opposition authors. Several top authors have affiliations with the top websites and links. For example, 15 percent of top links were written by top authors, and 35 percent of the top authors were contributors to or founders of the top websites.

Top vaccine opposition link themes (March 2022 - March 2023)



The top links had four main themes: negative vaccine side effects, alleged vaccine-related deaths, conspiracy theories about Bill Gates, and alleged vaccine ineffectiveness compared to natural immunity.



Methodology

PGP's Monitoring Lab's data dashboards monitor vaccine-related conversations 24 hours a day, 365 days a year. Dashboards are designed like a disease surveillance system: Analysts monitor media to understand knowledge, attitudes, and behaviors related to vaccines in real time and over time. To do this, analysts use several software platforms that collect publicly available media data across multiple media channels. The dashboards represent a sample of the data the Monitoring Lab processes.

The Monitoring Lab contracts with several competing media monitoring systems. Data from these systems are reviewed by PGN journalists as they conduct their reporting.

Data collection

Data is collected from keyword searches created by analysts that capture conversations about vaccination. Hundreds of keywords related to vaccination are organized into search string queries. These queries are updated frequently to reflect the natural evolution of public discourse, research, and reporting. The Monitoring Lab collects information in 11 languages, with additional languages added on a rolling basis. More information about the data collection process has been published in scientific journals (see [Bonnevie, 2020](#); [Bonnevie, 2020](#); [Mollema, 2015](#); [Chen, 2018](#); [Mooney, 2018](#); [Jamison, 2020](#); [Karafillakis, 2021](#)). For more information regarding the classifying of vaccine "opposition" see [Bonnevie, 2020](#) in particular.

Data access and representation

The Monitoring Lab's dashboards are updated in real time, collecting data across social and digital media (Facebook, Instagram, Twitter, Pinterest, Reddit, etc.), video sites (TikTok, YouTube, BitChute, Vimeo, etc.), online forums, and traditional media sources such as newspapers, magazines, television, and radio. Much public media data is not linked to a specific location; when dashboards do reference a geographic location, this determination is made by a combination of variables. For example, accounts may reference a location in their bio, or a conversation may make reference to a specific location. Analysts review data and adjust geographic filters manually to ensure data is as representative as possible.

Media companies place various levels of restrictions on third-party access to their data. The Monitoring Lab has access to the full Twitter firehose and Meta's CrowdTangle research tool, and it also purchases data from preferred partners in order to acquire as much data as possible. Terms of use for each site or data source are adhered to.

Data privacy

We take data privacy very seriously. The information automatically collected, aggregated, and presented on dashboards is from publicly available sources. Analysts perform research and investigations to determine the source and spread of misinformation and disinformation. This work can entail examining data that is not publicly available. In such cases, journalists adhere to strict research and journalistic principles, which are reviewed for legal and ethical concerns, including finding alternate ways of obtaining information through publicly available sources, weighing privacy and potential harm with public health impact, estimating the value of information obtained, and considering issues around transparency of identity versus personal security. Further reading on this subject is available at [First Draft's Essential Guide: Closed Groups, Messaging Apps, & Online Ads](#). (Link is to an external site provided as a resource and does not imply endorsement or partnership.)

Limitations

Analyses are based on keyword search queries, meaning that posts that don't contain these search terms are not included in the system. The data may not be representative of the overall conversation about the topic. For theme coding, it is possible that posts are miscoded, especially those using sarcasm. Analysts regularly check themes to ensure posts are tagged as the correct theme, but it is not possible to review every post in a theme. To address limitations, analysts have extensively tested this system and stay up to date on research regarding supervised machine learning.

Data provided on dashboards are intended to give a general overview of the conversations happening in each area, and each instance of misinformation should not necessarily be addressed; there may be instances in which addressing trending misinformation could do more harm than good. Analysts take into account many factors when providing their risk assessments, and any guidance is based on best practices across various sectors, including public health, public relations, and journalism.