STATE OF THE GMO DEBATE

towards an increasingly favorable and less polarized media conversation on ag-biotech?

Sarah Evanega[1], Joan Conrow[1], Jordan Adams[2], and Mark Lynas[2]

[1] The Alliance for Science, The Boyce Thompson Institute, Ithaca, New York, USA;
[2] Cision Global Insights, Ann Arbor, Michigan, USA

BTI BOYCE THOMPSON INSTITUTE

ALLIANCE FOR SCIENCE
a global initiative for science-based communications

Executive Summary

Despite **three decades of safe use and a world-wide scientific consensus on the safety of genetically modified crops** and foods, so-called 'GMOs' continue to generate controversy and debate.

This study looks at the **number and tone of over 100,000 online and print articles** published in English in top-ranked media between 2018 and 2020 as well as **1.7 million social media interactions.**

We find that the **overall tone of the GMO conversation is surprisingly positive,** averaging 73% favorable if neutral and positive reporting are combined, and appears to have **become somewhat more favorable** over the time period studied.

Social media tends to be more negative than traditional, but that gap has narrowed, with the **tone of the social media conversation improving** from 62% favorability to 78% favorability by the end of 2020.

We also find that while the volume of traditional media coverage increased during the period, there was a **dramatic fall in social media coverage,** of over 80%.

These findings combined suggest that there may be a **drop in salience of the GMO issue** among the wider population, with a more favorable and less polarized conversation across the globe.

This is good news for science, as it indicates that there may be **less opposition to scientific innovations** in agriculture and genetics in future.

Note: *this is a plain-language summary of a longer paper published by the above authors in the peer-reviewed journal GM Crops and Food, where it is available for free download.*

How the study worked — methodology

Source data was gathered by Cision Media Insights, which combined 200 pre-defined top tier English-language media and 75,000 online media with social media to analyze trends in the GMO debate globally.

This content was subjected to automated computer analysis in real time, using Cision's natural language processing and custom dictionaries. Articles were given a positive sentiment analysis tag if they would likely leave the reader feeling positive about GMOs, while a negative tag was assigned if the article would likely leave the reader feeling negative. The overall favorability value combines 'positive' and 'neutral' sentiment into a single value. We also use the 'mixed' or 'ambivalent' sentiment designation for lines of text that contain a positive and negative element.

Human analysis was included for relevance and sentiment validation of 10,800 top-tier English language articles and 54,000 social media posts per month, with analysis of the remainder being automated.

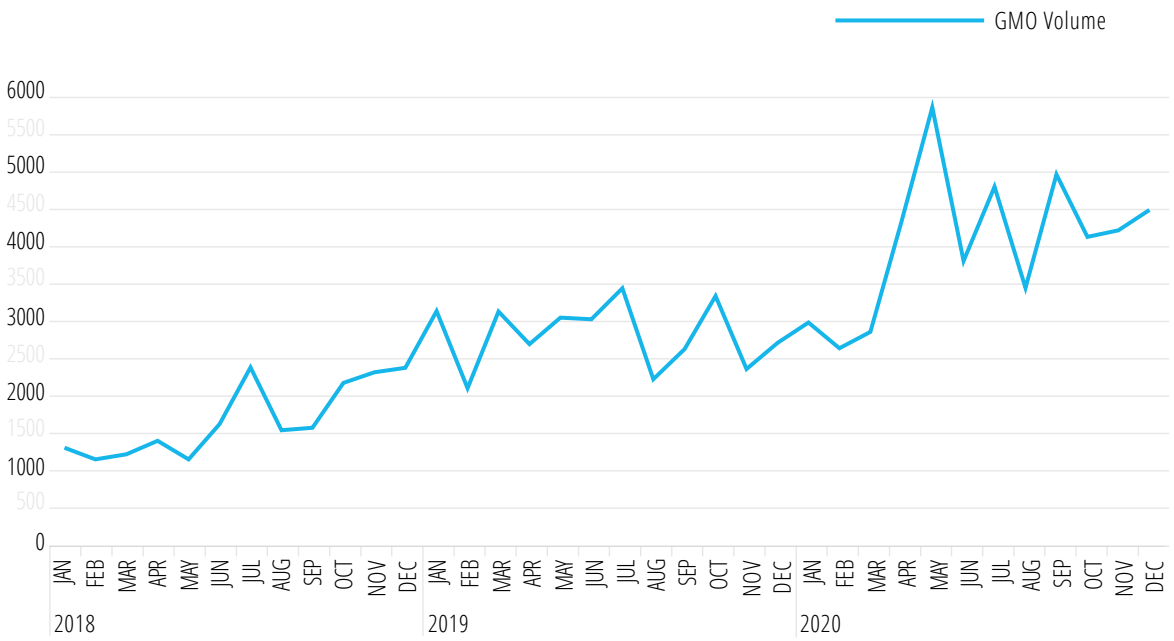
In total 103,084 traditional media articles covering GMOs were analyzed, alongside 1,716,071 pieces of social media content.

We use the term 'gross reach' to indicate the total potential audience of a media item, meaning the number of people who might have had the opportunity to see an original article or social media post.

What the study found — results

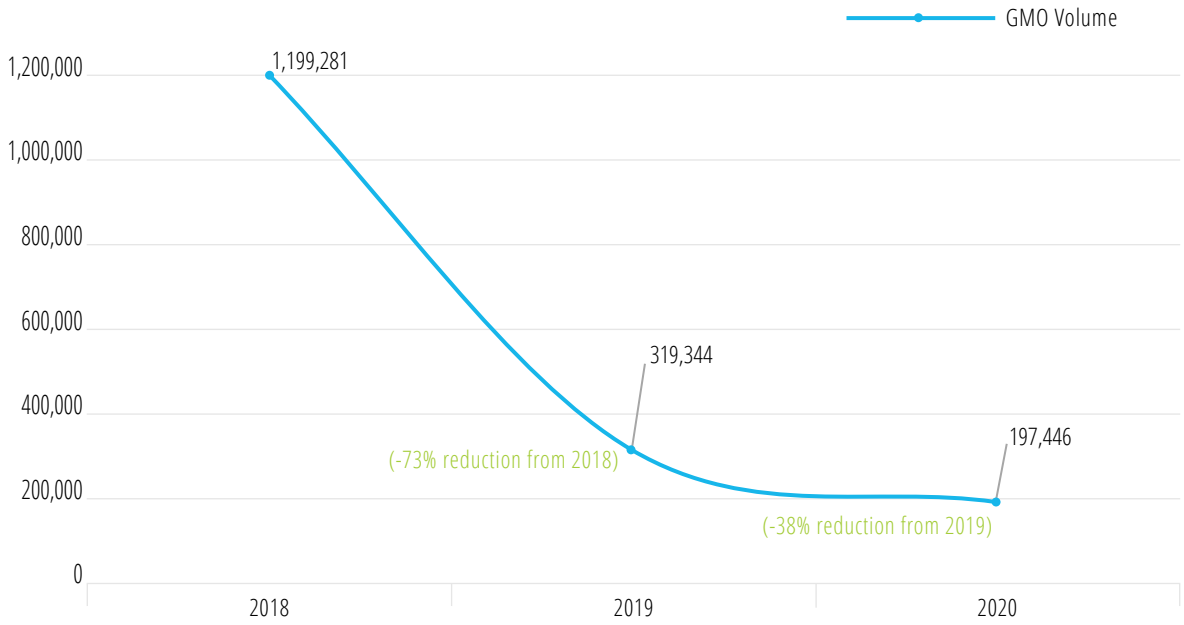
As Figure 1 shows, the volume of media coverage of the GMO issue more than tripled during the study period, from January 2018 to December 2020, from 1320 articles to 4502.

Figure 1: Volume of agricultural biotechnology GMO conversation in traditional media 2018-2020, showing the number of stories published.



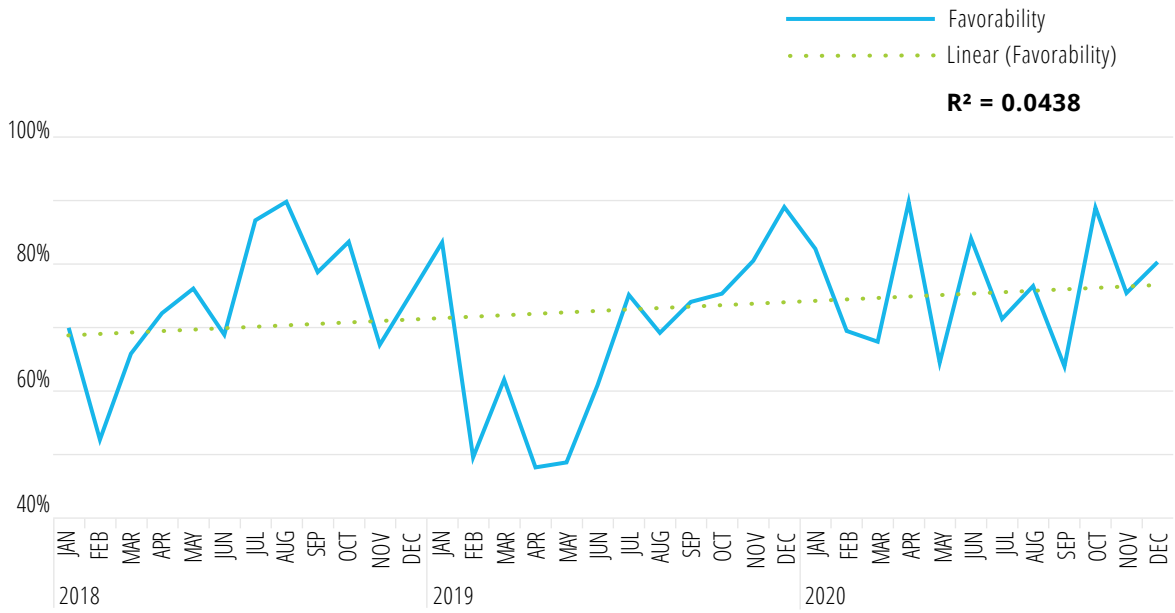
However, the volume of social media interactions showed a large decline over the same period, falling from nearly 1.2 million to just under 200,000 (Figure 2).

Figure 2: Volume of agricultural biotechnology social media interactions media 2018-2020.



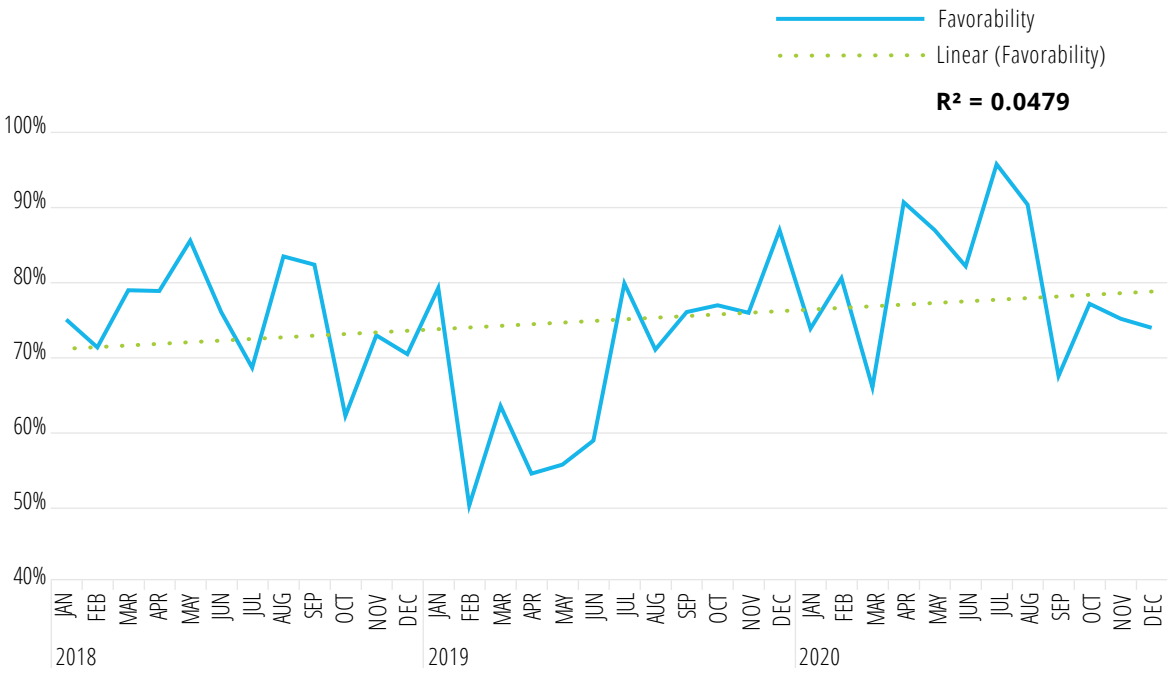
We find that the overall tone of the traditional and social media GMO conversation during the 2018 to 2020 period is generally favorable (Figure 3), and that favorability has increased somewhat, though the data are noisy and the trend not significant.

Figure 3. Sentiment analysis showing the favorability of the GMO conversation across all media (social and traditional combined) over a three-year period from Jan 2018 to Dec 2020.



Figures 5 and 6 deal with the sentiment of traditional and social media separately. The sentiment of the traditional media conversation around GMOs was slightly more positive than that of social media during the study period, averaging 75% favorable if neutral and overtly positive reporting are combined (Figure 5) as compared with 67% favorability in social media.

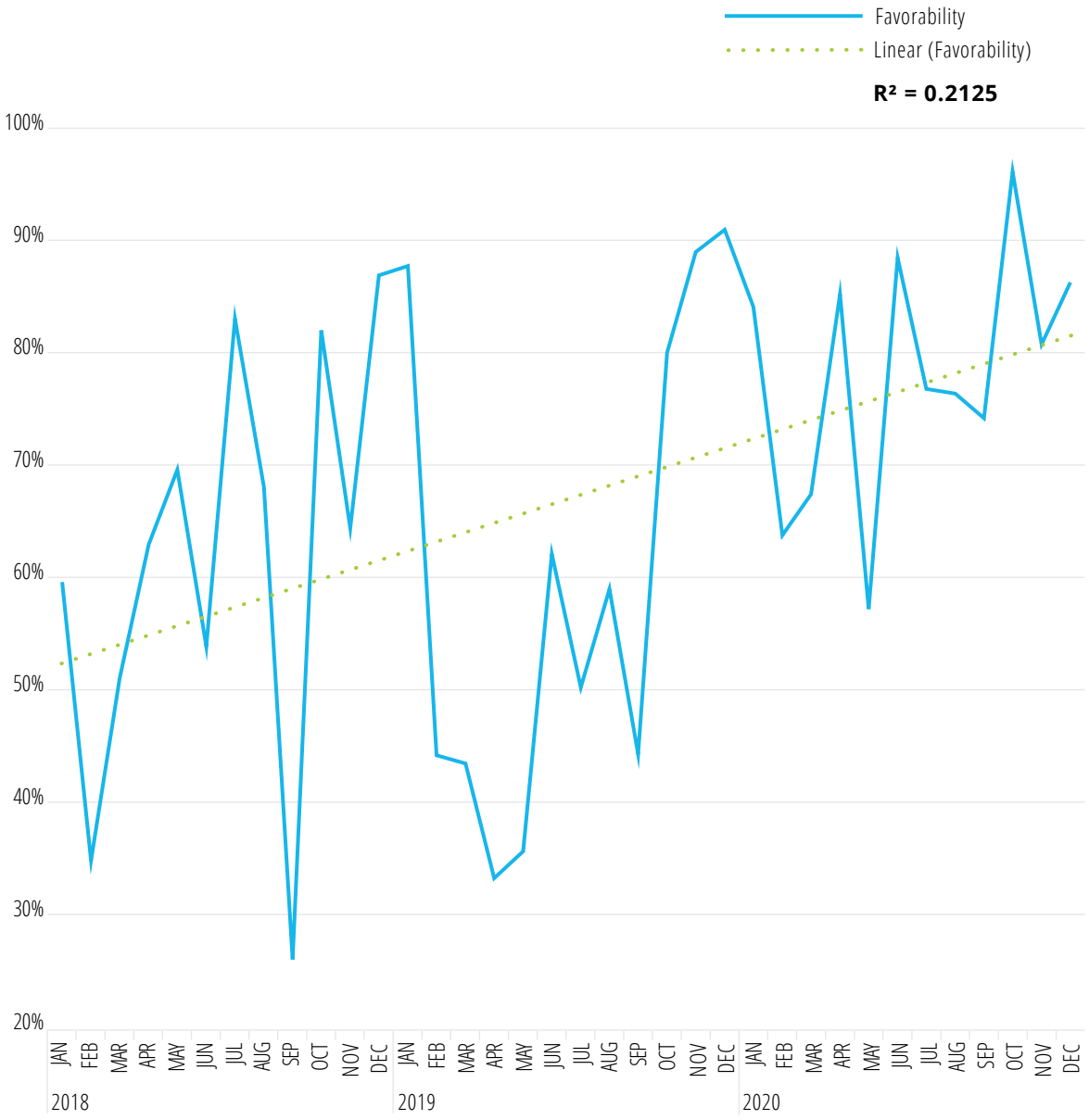
Figure 5. Traditional media sentiment analysis for the GMO conversation.



While sentiment towards GMOs in social media was substantially more variable than in traditional media, monthly values averaged in the 36-month time frame of the study show a strong long-term trend towards more positive social media coverage (Figure 6).

This may suggest that despite an increase in ongoing traditional media coverage there is less salience in the GMO debate in the wider population as indicated in the sharp decline in the volume of social media posts, particularly when combined with the strong trend towards increased social media favorability seen in Figure 6.

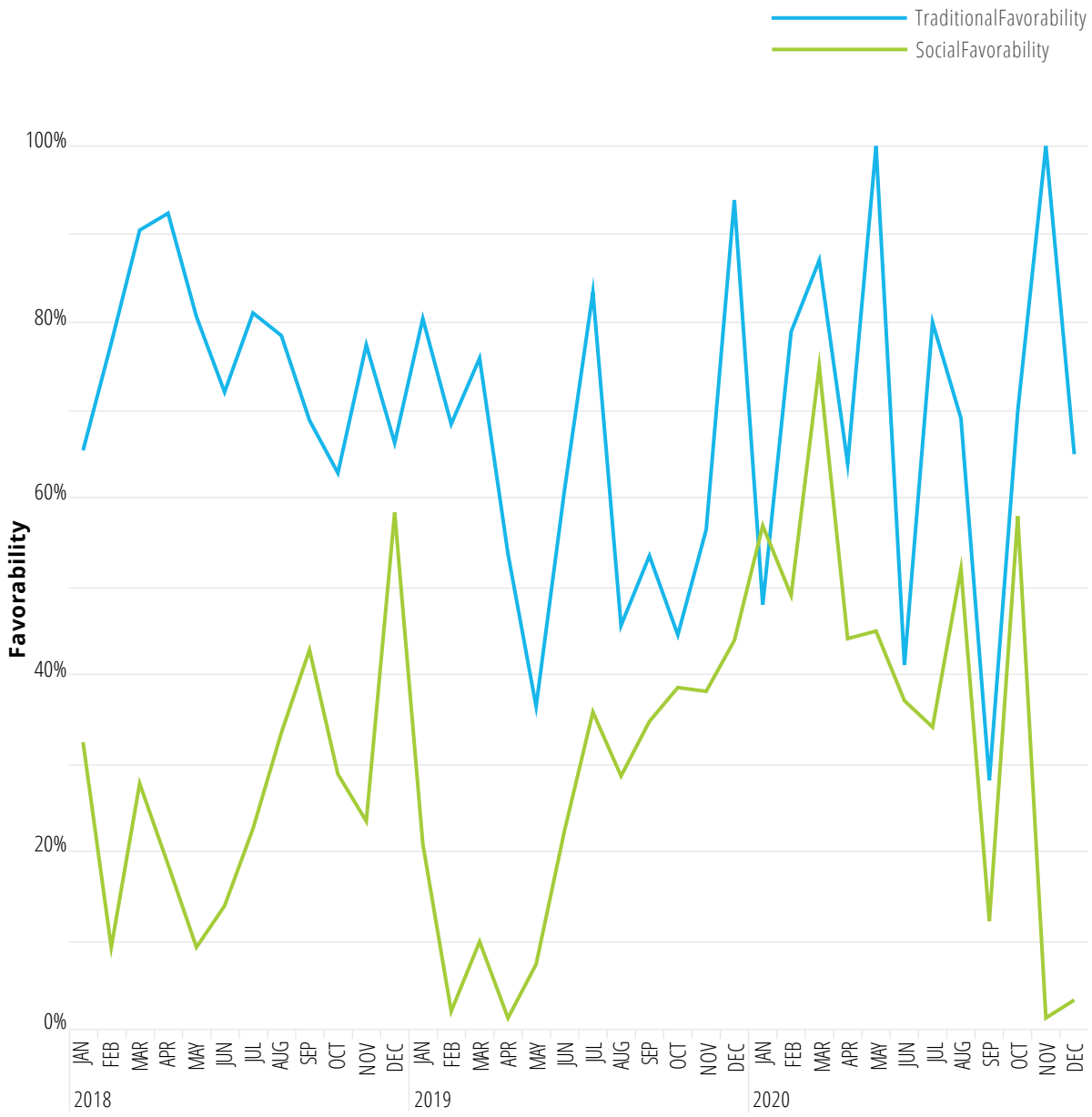
Figure 6. Social media sentiment analysis for the GMO conversation.



Other key takeaways

The Monsanto/Bayer effect:
Monsanto (now part of Bayer) and its association with pesticides, notably glyphosate, appears to strongly drive negative perceptions toward GMOs. Coverage of Monsanto/Bayer in both traditional and social media was consistently and considerably more negative than coverage of GMOs overall. (Figure 9)

Figure 9. The favorability of the coverage of Monsanto/Bayer over the three-year period in traditional (blue) and social (green) media.

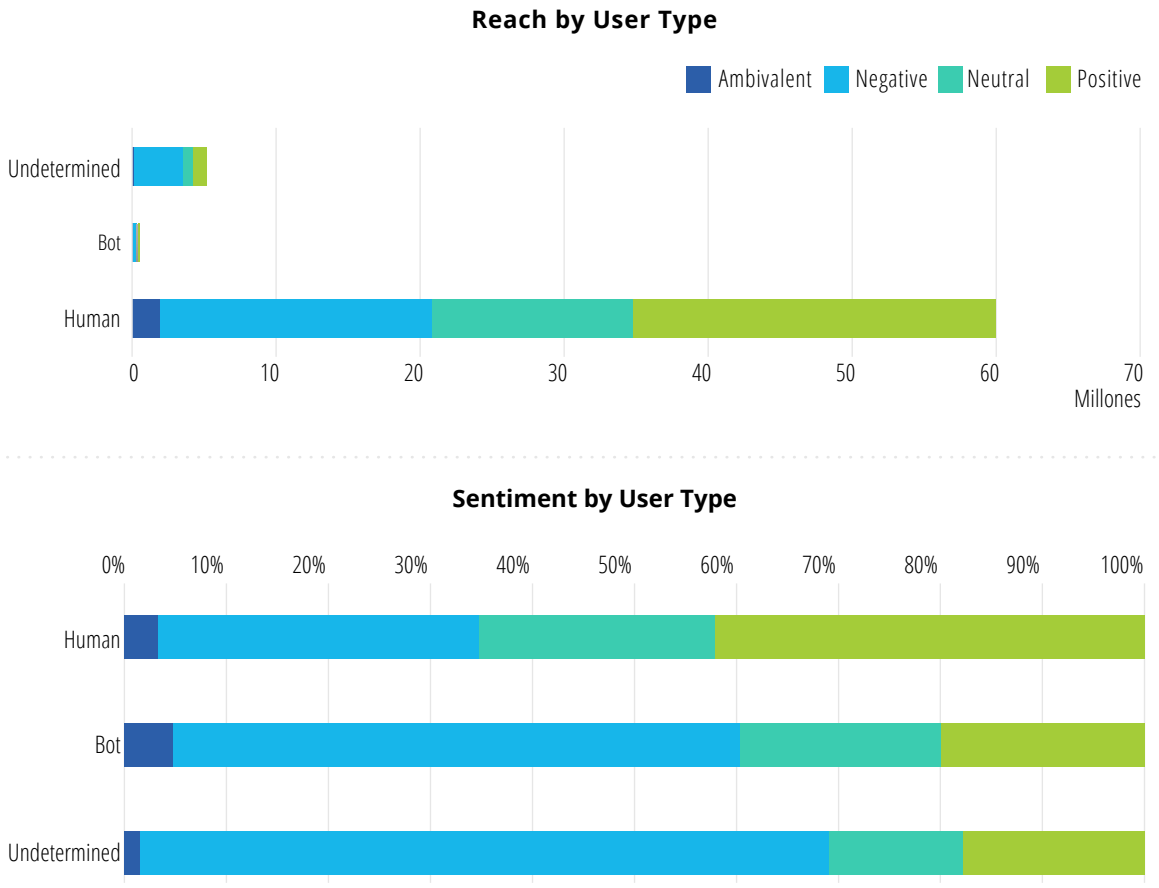


*Favorability is calculated by reach and includes positive and neutral/factual conversations

Influence of Twitter bots and cyborgs:

Bot accounts represented 10% of Twitter users engaged in GMO discussions between 2018 and 2020 and contributed 10% of overall tweet volume. We found that bots and cyborgs were substantially more negative in sentiment towards GMOs than human accounts. (Figure 10)

Figure 10. Role of Bots in GMO coverage 2018-2020.

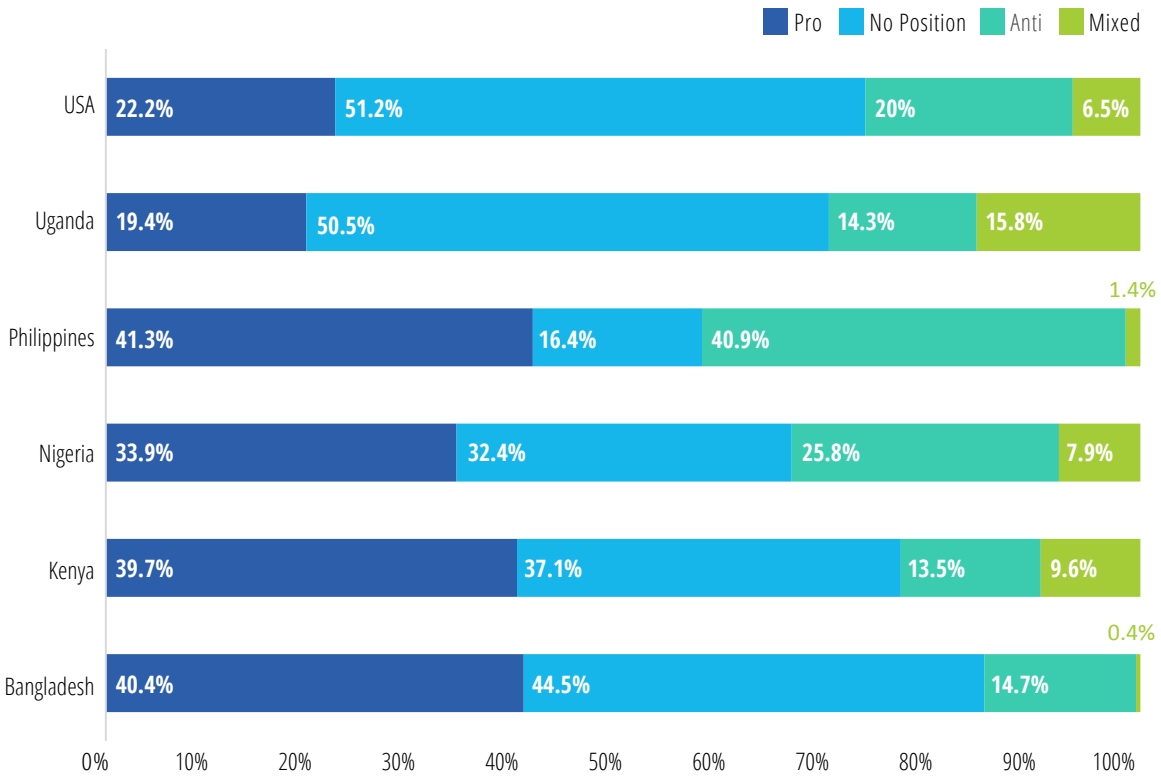


GMOs in Africa and South Asia:

The GMO conversation was different in Africa and South Asia than in the United States, which dominated in terms of overall volume and gross reach. The gross reach for the 2018 GMO conversation in the US was 3.6 billion, compared to 116 million in Kenya and 113 million in the Philippines.

Though the conversation was generally favorable in all countries, it was more favorable in the US, with the Philippines registering the highest percentage of negative coverage (Figure 11).

Figure 11. Sentiment analysis of GMO coverage (traditional and social media) in six geographies from 2018-2020.



Conclusion

Our analysis shows that while the volume of traditional media coverage of GMOs increased significantly during the period January 2018 to December 2020, this was combined with a dramatic drop in the volume of social media posts. Both traditional and social media saw trends towards increasing favorability, with the positive trend especially robust in social media.

The decline in volume of social media posts combined with a strong trend toward greater favorability may indicate a drop in the salience of the GMO debate among the wider population, even while the volume of coverage in traditional media increased. Overall, our results suggest that both social and traditional media may be moving towards a more favorable and less polarized conversation on ag biotech overall.

Although the situation appears to be improving, there is no guarantee that this will continue as the influence of negative sentiments and actors continues to weigh on the debate and skew public perceptions away from perspectives that are based on genuine scientific evidence.

Competing interest statement

The Alliance for Science *is funded in part by the Bill & Melinda Gates Foundation. A list of other donors can be found at https://allianceforscience.cornell.edu/about/funders/.*

Cision, Inc*. is a company that performs media analysis and provides other communication services for paying clients across a variety of sectors, including the Bill & Melinda Gates Foundation. This study contains the authors' objective analysis and may not reflect the views or attitudes of Cision or Cision's clients. No other competing interests are declared by the authors.*

BTI BOYCE THOMPSON INSTITUTE

ALLIANCE FOR SCIENCE
a global initiative for science-based communications