# Why did it go viral? An informatics-based case study of exaggerated language in news and social media

Hollie Rawlings,<sup>1</sup> Tomas Rees,<sup>1</sup> Lubaina Koti,<sup>2</sup> Avishek Pal,<sup>3</sup> Andrew Liew<sup>1</sup> <sup>1</sup>Oxford PharmaGenesis, Oxford, UK; <sup>2</sup>Dasman Diabetes Institute, Kuwait City, Kuwait; <sup>3</sup>Novartis, Basel, Switzerland

# 1. Introduction

- News stories and social media coverage about medical innovations can be exaggerated<sup>1,2</sup> leading to 'viral' stories that may erode public trust in science and medicine.
- We selected a case study to examine this phenomenon: a study of a novel rectal cancer treatment in 12 patients presented at the 2022 American Society of Clinical Oncology (ASCO 2022) Annual Meeting, and simultaneously published in NEJM.<sup>3</sup>
- This publication generated extremely high news and social media interest, and so provides a rich source of media content.

# 2. Objective

• We sought to understand the triggers and independent channels of the dissemination of this study and how the viral language used by these independent channels differed from the scientific language used by the investigators/authors in the originals.

# 3. A presentation at ASCO 2022 generated very high interest in rectal cancer

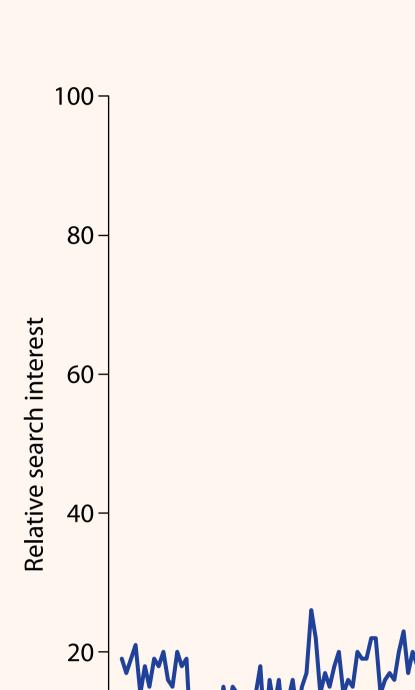
**ASCO 2022** 

4. Influential tweets came from politically affiliated accounts several days after

# 5. Media sources cited by key tweets used exaggerated language





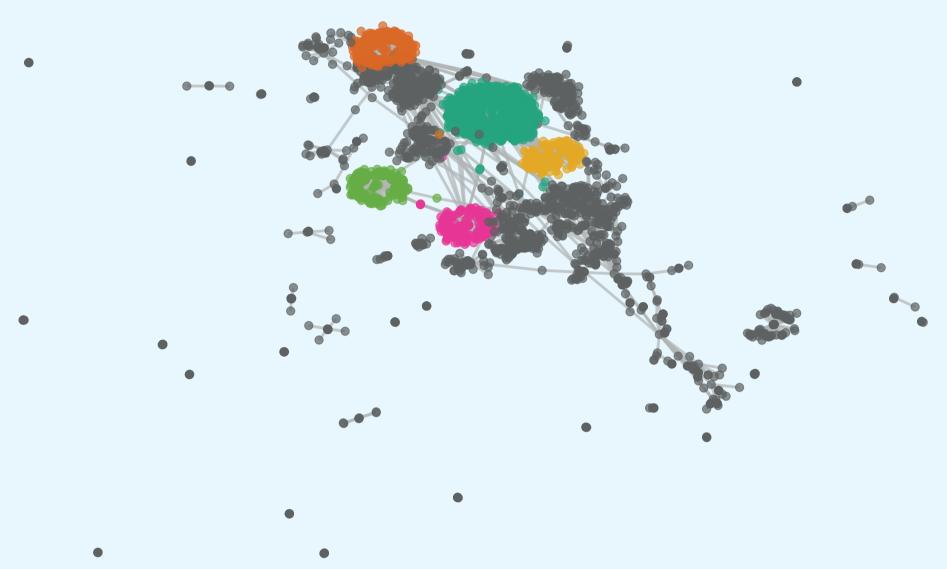


#### November July November May December August January 2022 2020 2021 2022 2019 2020 2022

### How this was discovered

• Google trends data for 'rectal cancer' in the period 30 November 2019–30 November 2022.

# initial publication



Cluster

•

- @ChuckCallesto, political strategist, no reference (7 June)
- @NPR, media outlet, citing NPR article (8 June)
- @DJTTracker, US politician (bot retweeter), citing NPR article (9 June)
- @DonLew87, attorney, citing NDTV/NY Times article (7 June)
- @nathaliejacoby1, political activist, citing CBS news (8 June) Others

### How this was discovered

• Twitter search for 'dostarlimab' and 'rectal cancer' (date range 5 June 2022–7 July 2022). Network cluster analysis based on retweets.

### **The New York Times**

# A Cancer Trial's Unexpected Result:

**Remission in Every Patient** The study was small, and experts say it needs to be replicated. But for 18 people with colorectal cancer, the outcome led to " happy tears.

### By Gina Kolata

June 5, 2022, 8:00 a.m. ET It was a small trial, just 18 rectal cancer patients, every one of whom took the same drug.

But the results were astonishing. The cancer vanished in ever single patient, undetectable by physical exam, endoscopy, PET

### scans or M.R.I. scans.

Dr. Luis A. Diaz Jr. of Memorial Sloan Ketterin author of a paper published Sunday in the Ne Medicine describing the results, which were company GlaxoSmithKline, said he knew of i which a treatment completely obliterated a c

#### This experimental drug could change the field of cancer research Arm 7, 2022 4:32 PM

ADMAND MEHTA

"I believe this is the first time this has happ cancer," Dr. Diaz said.

Dr. Alan P. Venook, a colorectal cancer spec of California, San Francisco, who was not i said he also thought this was a first.

A complete remission in every single part

https://archive.ph/eSDiX

### A tiny group of people with rectal cancer just experienced something of a scientific miracle: their cancer simply vanished after an experimental treatment.

In a very small trial done by doctors at New York's Memorial Sloan Kettering Cancer Center, patients took a drug called dostarlimab for six months. The trial resulted in every single one of their tumors disappearing. The trial group included just 18 people, and there's still more to be learned about how the treatment worked. But some scientists say these kinds of results have never been seen in the history of cancer esearch

Dr. Hanna Sanoff of the University of North Carolina's Lineberger Comprehensive Cancer Center joined NPR's All Things Considered to outline how this drug works and what it could mean for the future of cancer research. Although she was not involved with the study, Dr. Sanoff has written about the results.

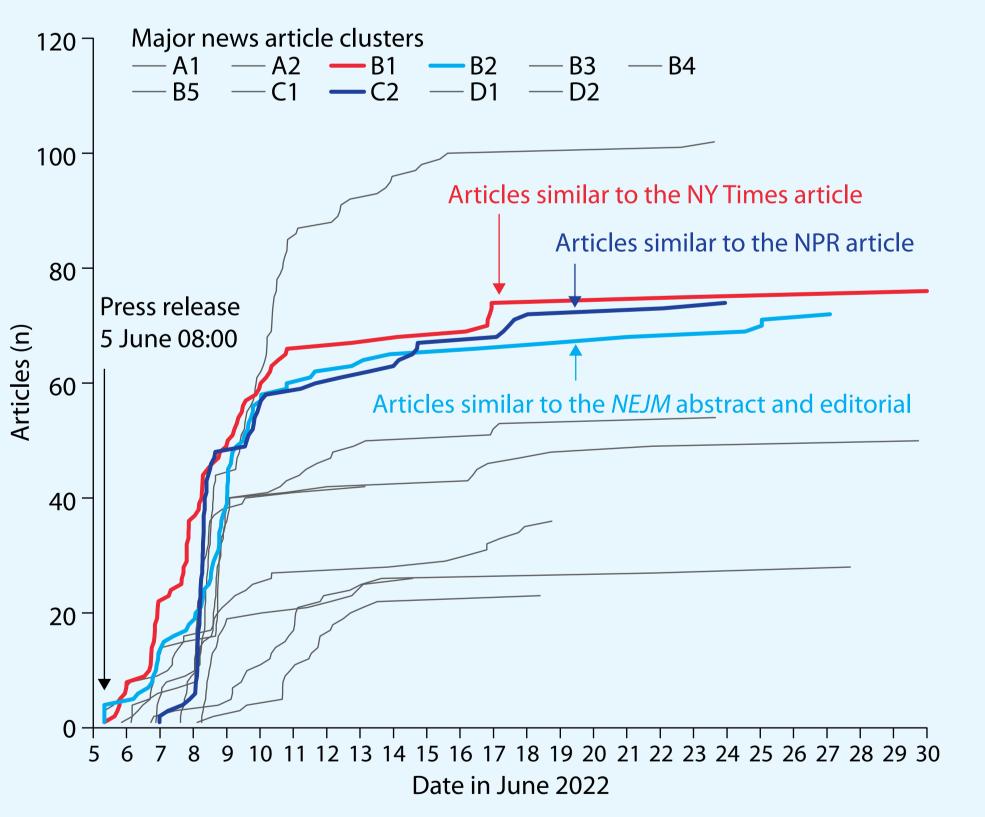
#### https://archive.ph/0yoB/

NPR

# 6. Clustering of news/web articles found

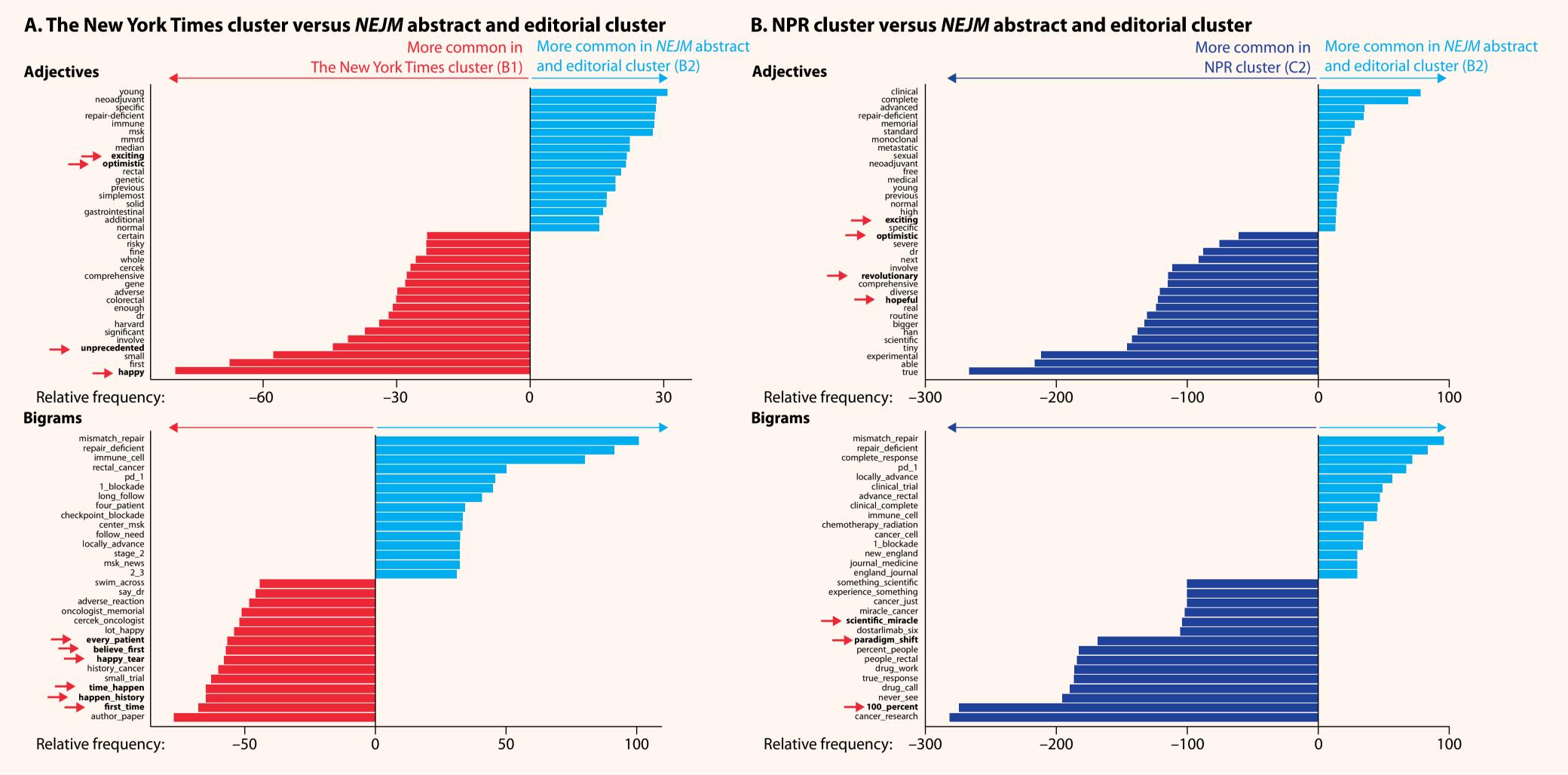
# 7. Comparison of word use between clusters of articles related to the media sources showed that they shared exaggerated language that is less common in more scientific sources

large numbers that shared the language of the media sources, and also ones that were more similar to the language of the NEJM abstract and editorial



## How this was discovered

- Feedly search for news/web articles on 'dostarlimab' and 'rectal cancer'.
- Key articles that were not found in the search were manually downloaded.



## How this was discovered

Text cleaning removed non-English articles and standard stop-words and performed lemmatization.

• Topic clustering was performed using BERTopic.

### • Network analysis of influential terms identified several articles with large amounts of irrelevant text – these articles were excluded from further analysis.

• Part-of-speech (pos) tagging was used to identify adjectives.

# Conclusions

- We found that news articles from major publishers used exaggerated language that was picked up by other media and by influential non-medical social media accounts.
- Exaggerated language used in some news articles, which substantially overemphasized the narrative of this trial, likely played a key role in the viral spread of information among the general public in news and social media.
- Plain language summaries can enable access to accurate, fair and balanced interpretation of medical research,<sup>4</sup> which may counter the perils of exaggerating or extrapolated reporting.
- This Al approach combining natural language models with text analytics allows analysis of large volumes of text to gain insights into the spread of messages.

#### References

1. Sumner P et al. BMJ 2014;349:g7015. 2. Suarez-Lledo V, Alvarez-Galvez J. J Med Internet Res 2021;23:e17187. **3.** Cercek A et al. N Engl J Med 2022;386:2363–76. **4.** Pushparajah DS et al. Ther Innov Regul Sci 2018;52:474–81.

#### Disclosures

HR, TR, AL: Employees of Oxford PharmaGenesis. LK: Nothing to disclose. AP: Employee of Novartis with no direct financial interest related to the assets or topics discussed in this poster.

### Presented at the European Meeting of ISMPP | 24–25 January 2023