Truth be dammed: One year after the Valencia floods, a deluge of disinformation persists

A study on climate dis/misinformation on YouTube and TikTok.

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AI FORENSICS

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Introduction

On October 29 2024, a year's worth of rain fell during an 8 hour period in parts of Valencia,[1] leading to flash floods that destroyed homes and swept away bridges, cars and railways tracks.[2] 237 people were confirmed to have died as a result of the floods,[3] deemed the most catastrophic flood-related event in Europe since 1967[4].

This intense rain was attributed to a phenomenon known in Spain as a "DANA", an acronym for the technical term used to describe this kind of event in Spanish which translates to "isolated low-pressure system at upper levels". Scientists have concluded that climate change escalated both the intensity and effects of 2024's DANA,[5] since the rising temperature of the Mediterranean – as much as 5C above normal – increases the potential for catastrophic rainfall, whilst hotter summers reduce the ability of soils to absorb water, making flooding more likely[6].

The 2024 DANA in Valencia made global headlines not just because of the catastrophic impacts, but also due to the extent to which dis and misinformation proliferated during and after, particularly online, sowing confusion amid the crisis.[7] In addition to spreading false information that caused panic and created challenges for emergency responders, [8]common dis/misinformation narratives undermined or even explicitly denied the link to climate change. This kind of dis/misinformation has been shown to cause serious harm,[9] and in the long term, undermine climate action[10].

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1 What caused deadly floods in Spain? The impact of DANA explained. (Reuters)

2 Why were the floods in Spain so bad? A visual guide. (The Guardian)

3 Actualización de datos del Gobierno de España (Spanish Government)

4 See 1

5 Heavy precipitations in October 2024 South-Eastern Spain DANA mostly strengthened by human-driven climate change

6 Scientists sure warming world made Spain's storm more intense (BBC News)

7 'It can lead to chaos': false claims and hoaxes surge as Spain's floods recede (The Guardian)

8 La presidenta de Cruz Roja denuncia que, con la DANA, sufrieron campañas de desinformación" (Nueva Economía Fórum)

9 Extreme weather: How a storm of false and misleading claims about extreme weather events spread unchecked on social media putting lives at risk (Center for Countering Digital Hate) Extreme-Weather-FINAL.pdf

10 IPCC, *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report*, Cambridge University Press, 2022, pp. 1931, 1939.

This study into DANA-related climate dis/misinformation that appeared on TikTok and YouTube in the month following the event highlights the urgent need for platforms to take decisive action to address their role in the spread of climate dis/misinformation, especially during times of crisis. It demonstrates not only that climate dis/misinformation is viewed by millions, but concludes that these platforms contributed to this by algorithmically amplifying it, boosting it through recommender systems or other features. It also concludes that climate dis/misinformation - and ensuing discussions about it - derails online discourse during times of crisis. Finally, it shows that even a year after the event, and following substantial efforts from organisations like Fundación Maldita.es to debunk viral conspiracy theories, climate dis/misinformation persists on TikTok and YouTube, in some cases, in direct contravention of platform policies on dis/misinformation.

Findings

As detailed in the methodology section, our study compares:

- → All videos posted about the DANA in Spain in the month following the disaster
- → A sub-sample from the previous group that promoted or discussed specific climate dis/misinformation narratives about the DANA, previously debunked by Fundación Maldita.es.
- → A further sub-sample of the top 1000 most viewed videos, where we established if they actively promoted dis/misinformation about the DANA

After looking at different variables for all three groups, several findings emerged:

1. Climate dis/misinformation is prevalent, and data strongly suggests platforms algorithmically amplified climate dis/misinformation during and after the DANA

Videos promoting dis/misinformation had *significant* overall reach on TikTok and YouTube. On the basis of our findings, we estimate that climate dis/misinformation videos[11] obtained at the very least 13 million views on YouTube and 8.3 million on TikTok - likely even more. To provide a comparison, each dis/misinformation video about DANA on YouTube had an average of 21,250 views which is almost four times the platform average[12]. On TikTok these videos had 32,294 views on average[13].

These figures indicate substantial platform-level amplification, as such scale, in our experience, is impossible to reach without platforms boosting them through their recommendation systems.

11 Those published in the month after the event and still available online 10 months later

12 McGrady, R., Zheng, K., Curran, R., Baumgartner, J., & Zuckerman, E. (2023). Dialing for videos: A random sample of YouTube. *Journal of Quantitative Description: Digital Media*, 3.

13 See methodology for differences on how platforms count views

2. Disinformation is derailing online discussions about extreme weather events, and likely drowning out helpful and informative content in crisis situations

On YouTube, videos **discussing dis/misinformation**—either promoting or questioning it—were more likely to be liked (+48%), and significantly more likely to be commented on (+123%) than DANA content generally. On TikTok, videos discussing dis/misinformation were much more likely to be shared (+85%) than DANA content generally.

These results show that content containing or discussing dis/misinformation received greater engagement and/or more views than average for DANA content, further demonstrating what is already well-established: **dis/misinformation is good business for platforms that profit from user engagement** and time spent on their services.

YouTube and TikTok's recommendation algorithms are designed to amplify content to maximise user engagement and as a result, are known to recommend content that provokes strong user reactions. In this case, that content was dis/misinformation, which our findings suggest received amplification above and beyond more factual information. The real-world impact of this is that accurate, helpful and informative content during a crisis situation is drowned out or diluted by dis/misinformation and discussion about it. In a crisis situation like the DANA, the consequences of this may be severe.

3. Platform actions to address climate dis/misinformation—even during high-profile, extreme situations where lives are at stake—are falling desperately short

The prevalence of climate dis/misinformation that has been clearly, categorically and publicly debunked by Fundación Maldita.es almost a year following the event is deeply concerning. Both platforms have publicly committed to addressing harmful dis/misinformation, and TikTok has a specific policy[14] on climate dis/misinformation. Yet almost a year later, this content remains widely available on both platforms with little apparent intervention.

14 Integrity and Authenticity (TikTok)

YouTube has been criticised for its failure to develop a specific policy on climate dis/misinformation[15]. The platform does not work with external fact-checking organisations to identify climate dis/misinformation, and controversially pulled out of commitments on fact-checking under the EU's (then) Code of Practice on Disinformation in January 2025[16]. Nevertheless, YouTube does commit to "provide users with tools to help them make more informed decisions when they encounter online information that may be false"[17] and yet **less than one in four videos containing dis/misinformation contained any kind of warning.** In all cases, content that was labelled by YouTube simply identified the channel as state media or added a generic statement saying that "human activities have been the main driver of climate change".

On the other hand, TikTok specifically prohibits "misinformation that denies the existence of climate change, misrepresents its causes, or contradicts its established environmental impact" and **yet more than a hundred examples of videos denying or diminishing the role of climate change in the DANA were available on the platform one year after the event.** The platform also states that it "may add warning labels to content that our fact-checking partners cannot verify" but none of the climate dis/misinformation identified in this study had a warning label attached to it.

4. Lack of platform transparency seriously impedes the study of climate dis/misinformation in the context of extreme weather

→ Platforms are not open about the role that their systems play in amplifying climate dis/misinformation. Currently, researchers can only access data about content itself, not the algorithms that determine how it is displayed, where it appears in search functions or recommends content to users. This means that the effects of algorithmic amplification can only be examined using sophisticated, independently developed tools which are expensive and hard to access, and even then can only study how information spreads in the moment, not retrospectively. Overall, this is a major obstacle for research and platform accountability.

→ In the case of YouTube, even data access on content is insufficient to enable proper study through the platform's official channels (API). As demonstrated by a recent study, the API is extremely unreliable for research seeking to study issues or events that occurred more than 60 days before the data collection took place, providing

15 PLATFORMS' POLICIES ON CLIMATE CHANGE MISINFORMATION (EU DisinfoLab)

16 Google rejects EU fact-checking commitments for Search and YouTube (The Verge)

17 Commitment 22, EU Code of Practice on dis/misinformation

"highly incomplete samples" for searches conducted beyond this timeframe.[18] This study was affected by this severe limitation, to the point that we were unable to use YouTube's API to conduct this research. This has led researchers to conclude that YouTube's API is not "robust enough to meet the broader requirements of the DSA for enabling researchers to study the systemic risks associated with very large online platforms"[19].

→ These findings of this study would have been complemented by research exploring the degree to which platform revenue redistribution programs may have enabled users posting climate dis/misinformation to obtain remuneration for this content. Yet neither TikTok nor YouTube provide data on this aspect of their activities. Monetisation, like algorithmic amplification, remains one of the many obscure parts of platform analysis that is difficult –impossible, even – to study independently.

18 Forgetful by Design? A Critical Audit of YouTube's Search API for Academic Research (Bernhard Rieder, Adrián Padilla, and Óscar Coromina)

19 See 19

Methodology

Data Collection Methodology

As a starting point, Fundación Maldita.es provided AI Forensics with two lists (List 1 and List 2) of keywords and their combinations related to the DANA floods. The keywords from List 1 were used as search queries, while the keywords from List 2 served to filter the collected data. As such, the purpose of List 1 was to capture all videos about the DANA flooding, while the purpose of List 2 was to identify among the captured videos those that were likely to contain or discuss concrete dis/misinformation narratives about the event that had previously been debunked by Fundación Maldita.es.

AI Forensics initially decided to use TikTok's and YouTube's APIs to collect data. Platforms offer APIs as a way to programmatically navigate the platforms either publicly, as is the case for YouTube, or after explicit approval, as is the case for TikTok.

We searched for content on both platforms using the keywords in List 1, limiting the results to include only videos published during the period between 29 October 2024 and 28 November 2024 (30 days) to capture the online conversation about the DANA when it was the most intense. More specifically, we divided the period in 30 separate days (each day called a slot), and we searched each keyword in List 1 for each *slot*. Finally we filtered the collected videos using the dis/misinformation keywords from List 2, focusing on the keywords' presence in the videos' caption, text and description of the videos.

List 1: keywords used to query the platforms	
Inundaciones AND Valencia	temporal AND "Comunidad Valenciana"
Inundaciones AND "Comunidad Valenciana"	riada AND Valencia
"la DANA"	riada AND "Comunidad Valenciana"
DANA AND Valencia	riadas AND Valencia
DANA AND "Comunidad Valenciana"	riadas AND "Comunidad Valenciana"
temporal AND Valencia	

List 2: Keywords used to filter content for annotation		
HAARP AND DANA	HAARP AND Valencia	HAARP AND “Comunidad Valenciana”
presas AND DANA	presas AND Valencia	embalses AND DANA
embalses AND Valencia	“radar meteorológico” AND DANA	“radar meteorológico” AND Valencia
“radares meteorológicos” AND DANA	“radares meteorológicos” AND Valencia	Marruecos AND DANA
“agenda 2030” AND DANA	“armas climatológicas” AND DANA	“armas climatológicas” AND Valencia
“manipulación del clima” AND DANA	“manipulación del clima” AND Valencia	“manipulación climática” AND DANA
“manipulación climática” AND Valencia	“élite globalista” AND DANA	“élite globalista” AND Valencia
“élites globalista” AND DANA	“élites globalista” AND Valencia	“presa de Cheste” AND DANA
“presa de Cheste” AND DANA	“destrucción de presas” AND DANA	“destrucción de presas” AND Valencia
“radar de Morón de la Frontera” AND DANA	“radar de Morón de la Frontera” AND Valencia	“impulsos electromagnéticos” AND DANA
“impulsos electromagnéticos” AND Valencia	“ataque meteorológico” AND DANA	“ataque meteorológico” AND Valencia
“ataques meteorológicos” AND DANA	“ataques meteorológicos” AND Valencia	“ataque climático” AND DANA
“ataque climático” AND Valencia	“ataques climáticos” AND DANA	“ataques climáticos” AND Valencia
“ataque climatológico” AND DANA	“ataque climatológico” AND Valencia	“ataques climatológicos” AND DANA
“ataques climatológicos” AND Valencia	“Nubes estáticas” AND DANA	“Nubes estáticas” AND Valencia
Forata AND DANA	“radar AEMET” AND DANA	

TikTok data collection

For TikTok, AI Forensics used the TikTok research API to search for the videos. In collaboration with partner organisations, AI Forensics recently evaluated the two main access routes to TikTok data: the Virtual Computer Environment (VCE) and the official API. The VCE proved largely unusable, and the official API produced inconsistent results when paired with a crowdsourced data-donation workflow (participants submit the IDs of recommended videos, which researchers later enrich with metadata). We therefore ran a keyword-based study using the API to test its compliance with the declared features and, in that setting, it worked without the issues seen in the other methods.

Between 29 July and 2 September 2025, we collected roughly 173.000 unique video identifiers from 1.23M search results. We concluded that the information (including the metadata). For each slot (day in the period analyzed), we searched for every keyword from List 1. We then proceeded to go through the results of each search operation with the keywords from List 1 over multiple days (this was due to TikTok's API daily request limits, as we had a limited amount of results we could collect each day).
We found the List 2 keywords to match 820 video descriptions and 61 captions (the TikTok API provided a caption only for 11.4% of videos).

YouTube data collection

AI Forensics used a combination of scraping and APIs to collect data on YouTube. Between 26 August and 2 September 2025, AI Forensics collected 27.993 search results, which contained 11.645 unique videos.

When collecting data using YouTubes Search API, the result was inconsistent: the returned number of matching videos did not correspond with the number of videos that the API was returning. For example, in some cases the API reported around 20.000 videos found matching the keyword in the given slot, but no video information was actually returned. We also found the number of videos to be restricted to around 500 results per platform. This aligns with the 'recency bias' reported by other researchers: the YouTube API is largely unsuitable for studying past events and appears useful primarily for live monitoring. This is a significant issue the platform should address to enable researchers to collect the data they need, as required under the DSA.

We therefore decided to use a scraping approach, collecting data directly from the YouTube website.

We built a custom scraper and leveraged Spanish residential IP proxies to trigger search results as they would be seen by Spanish citizens. We repeated each query (each keyword in the slot) 16 times to account for different search settings that YouTube offers: the four duration spans ("All", "0 to 4 minutes", "4 to 20m" and "20m+"), four different orderings

of results (relevance, upload date, view count and rating). We then repeated the whole collection four times, as each collection produced an exponentially decreasing number of new results.

Subsequently, we enriched the video details using YouTube's official API (which worked when asking information about a specific video).

To collect the captions, we resorted to scraping once more. We tried to download captions in Spanish if found to be included in the video. If not found, we listed all the possible captions in the video; If we found any language that YouTube would use to translate to Spanish, we'd use that. If no Spanish caption was found, then we would default to English. If no English caption was found, none was collected.

We found that the List 2 keywords matched 220 YouTube video titles/description and 1565 captions.

Geolocation and Metadata

AI Forensics used IP geolocation in Spain to collect videos published during the time window between 29 October and 29 November 2024. All available metadata was collected, including:

YouTube	TikTok
• video id • video url • channel id • publish time • enriched at • video category name • language • view count • like count • comment count • has paid product placement • duration seconds • caption • description	• id • author id • publish time • region code • music id • playlist id • is stem verified • video duration • like count • comment count • share count • caption • hashtags • effects • stickers • mentions • view count • description

Annotation Methodology

AI Forensics provided Malditas.es with four total datasets:

→ Two datasets of videos, one per platform (YouTube and TikTok), corresponding to the list of pre-defined dis/misinformation keywords in Spanish.

- For YouTube, 1,656 videos containing any of the keywords in their title, description, and/or captions.
- For TikTok, 878 videos containing any of the keywords in their description or captions.

→ Two other datasets of posts corresponding to the general online conversation about the DANA over the same period, in order to allow further comparison of reach and engagement between the two predefined groups of keywords.

- For YouTube, 12,333 videos containing any of the keywords in their title, description, and/or captions.
- For Tiktok, 173,218 videos containing any of the keywords in their description or captions.

Fundación Maldita.es annotated a total of 1,000 pieces of content (500 per platform) from the datasets corresponding to the list of pre-defined dis/misinformation keywords in Spanish. Experienced fact-checkers from Fundación Maldita.es followed the following procedure for each of the provided links:

1. Claims detection

The content of each link was analyzed to identify potential dis/misinformation statements or manipulated/altered media. Those were then cross-checked with Maldita.es' internal database of verified claims/content related to the DANA.

2. Dis/misinformation identification

In the case of the content matching dis/misinformation previously debunked by Maldita.es, it was classified as containing dis/misinformation. This means that the link contained at least one claim/media that has been categorized by Maldita.es as 'False', 'Alert', or 'Needs Context' according to Fundación Maldita.es' public fact-checking methodology, which is explained in further detail below. This internal rating as well as the link to Maldita.es' public debunk was also registered for justification purposes. If the content did not correspond with dis/misinformation previously debunked by Maldita.es, it was tagged as not containing dis/misinformation.

3. Archiving

All original content from TikTok or YouTube was archived online as part of the annotation process and the URL linking to the archived version is included in the annotated dataset to preserve evidence in case of removal by either the platform or the user. Tools such as the Wayback Machine, Ghost Archive, or other similar ones were employed for this task. Manual preservation (screenshot) was considered if automatic archiving was not available.

4. Platforms' labels

During the annotation, Fundación Maldita.es also manually noted whether content displayed a visible label or warning deployed by the platform for additional information. The type of label, if any, was registered. According to the platforms themselves, potential labels include:

YouTube Labels:	TikTok Labels:
• Topical Context Panel • Publisher Context • Altered or Synthetic Content • Fact-Check Information Panels	• Unverified Content • Flagged for Unverified Content • AI-Generated Content

Debunking Methodology

The individual videos were annotated as dis/misinformation if they contained claims that have previously been rated by Maldita.es in one or more of the to the following categories:

→ **False/Hoax:** Content that Maldita.es has independently verified as false.

→ **Alert:Content** lacking clear evidence of being factual, but also without enough independent sources to call it false. This includes ambiguous messages or those mixed with truthful elements.

→ N**eeds context:** Content related to ongoing debates or unresolved issues, where no definitive conclusion can be made but additional information would be useful for the user to avoid them being misled.

Any claim categorized as 'dis/misinformation' for the purposes of this research will have been evaluated using Maldita.es' public and standardized verification methodology. The methodology consists of the following phases:

→ **Selection of claims for verification:**

Fundación Maldita.es decides which claims to fact-check based on two main criteria: virality and harm potential. Viral content, information that circulates widely across different platforms, formats, or is shared by influential figures, takes priority since its reach makes it more urgent to address. The team evaluates how often a piece of content appears across channels, the scale of its dissemination, and who is amplifying it. However, not all dis/misinformation needs to go viral before being fact-checked by Fundación Maldita.es. Some claims, even if still limited in reach, can pose immediate risks if they emerge in sensitive contexts such as health crises, emergencies, terrorist attacks, or natural disasters. In such cases, Maldita.es treats them as high-priority due to their potential to cause harm.
Fundación Maldita.es only verifies data, figures, and facts that can be substantiated, as well as claims that shape public debate. While opinions themselves are not subject to verification, Maldita.es can expose falsehoods that underpin them, especially when opinions rely on falsified or out of context documents or other manipulated data. This methodology is applied consistently, regardless of who spreads or is affected by a particular piece of dis/misinformation, ensuring neutrality and impartiality.

→ **Investigation and first draft:**

Once a claim is selected for fact-checking, a journalist investigates it to determine what can be verified and how it is being interpreted by the public. The process involves consulting reliable sources, checking data, and using technological tools to analyze images, videos, or audio. If the dis/misinformation content comes from a political representative, Maldita.es contacts them or their team before publication, giving them a 12-hour window to respond. Their statement, if it arrives later, is still added to the article. The resulting draft of the fact-check includes all supporting evidence, with linked sources and other proof, so that readers can replicate the verification. Importantly, the text avoids judgmental or subjective expressions, presenting the findings in a precise, neutral way.

→ **Editing:**

The fact-check draft is then reviewed by editors who question and refine the work. Their role is to check the adequacy of the sources, the methods used to reach conclusions, and whether any technical processes were applied properly. Editors may request further investigation if they believe a claim has not been sufficiently substantiated. If the draft does not meet the organisation's methodological standards, the process is paused until improvements are made.

This editorial oversight guarantees that every verification is both rigorous and transparent. By requiring detailed documentation and fact-based reasoning, the editing stage ensures that the analysis is free from bias and firmly grounded in evidence. It functions as a safeguard against errors, reinforcing the reliability and credibility of the final publication.

→ **Multiple Verification Filter:**

Before publication, each verification goes through a collective decision making procedure by our senior editors with fact-check approval capacity, whose names and backgrounds are publicly detailed in Fundación Maldita.es website. Approval requires four votes, which validate the fact-check. In urgent cases, if three votes are secured, an expedited process can be triggered, giving the other editors 15 minutes to raise objections before publication proceeds.

Every senior editor with fact-check approval capacity also has the right to veto the publication of any fact-check, provided they justify their objection on methodological grounds. Ideological vetoes are not permitted. The same voting process applies to corrections: if a published verification is found to contain an error that alters the rating, it must again obtain four votes to be corrected. Updates that add new information but do not alter the rating require at least two votes, while updates that increase the severity of the rating must undergo the full validation process again. This multi-step approval system ensures both accuracy and accountability, reinforcing Fundación Maldita.es' commitment to neutrality and transparency.

Estimation of metrics for dis/misinformation videos

To calculate the total views of dis/misinformation videos, we established the percentage of total views of the 500 videos that we annotated for each platform that responded to dis/misinformation key words that were attributable to videos deemed to contain climate dis/misinformation. We then applied this percentage to the total views of the content responding to climate dis/misinformation key words, to estimate the number from these total views attributable to the content promoting climate dis/misinformation. In reality, this estimate is likely (very) conservative, since (i) it does not account for views on DANA dis/misinformation that was not caught in our key word sample (i.e. other narratives that spread during this time) and (i) there likely were other dis/misinformation narratives about DANA that were not debunked by Fundación Maldita.es

By Fundación Maldita.es and AI Forensics.

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