Infodemiological Report about Spain
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This note analyses the infodemic trends in Spain in the Jan - Nov 2020 period. Our analysis provides a comprehensive view of the infodemic trends related to posts written in both local and foreign languages in the country territory as about 72% of tweets are written in Spanish. The infodemic profile might be very different in principle for contents in the local mother tongue and in the foreign language.

- **Coverage level: <u>High</u>**
  An average of more than 90,000 tweets per day. Between 22nd Jan and 23rd Nov 2020: 24.5 million tweets with self-declared location associated with Spain, 4.3 million tweets contain URLs linking to news sources, of which 1,170,000 were successfully identified as either reliable or unreliable by crossing the URL domain with our database of news domain reliability, 848,000 of which were written in Spanish.

- **Infodemic Risk: <u>Low</u>**
  A low (6%) current and average value of *IRI* during the period considered. The infodemic risk from an exposure perspective (how many users are potentially exposed to unreliable news?) initially grew in time up to a level of 4% (February) and then grew up to 7% (April) and then stabilized to the current value of 6% (November).
  A low/medium *dynIRI*, a measure of the infodemic risk from social media engagement (how many users are observed propagating unreliable news?), which for Spain fluctuates around an average of 26%, corresponding to the 51th percentile worldwide.

Together with Italy, Spain represents the positive example of Southern Europe. The country has a low infodemic risk in the period of observation, created largely by influential verified accounts that are widely endorsed by the twitter user base, as is suggested by the higher value of dynIRI.
**Policy implication**: the combination of high information flows and low risks makes Spain an exemplary country whose current infodemic profile is not critical. The most outstanding criticality is the ample credit given to influential verified accounts that could negatively influence the overall level of infodemic risk despite the fact that it has remained constantly low so far.

Temporal trends
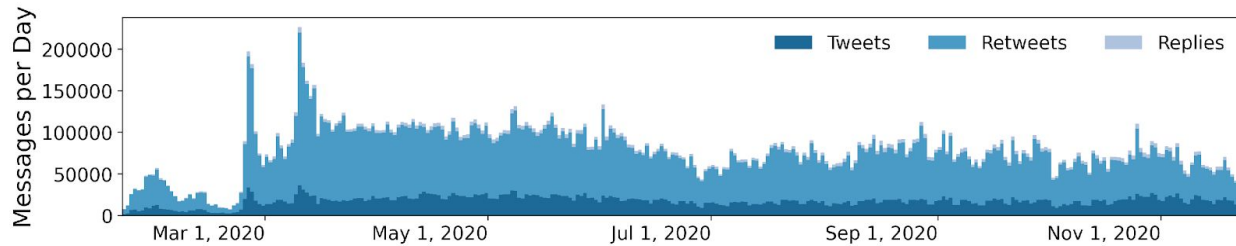
Number of Tweets per day. We have an initial low volume phase, that is interrupted by two big bursts of retweets followed by a continuous and stable high activity throughout the year. As it can be seen, the main driver of the overall activity is made of retweets, which means that the main conversation is shaped by a relatively small number of influencers whose posts are widely amplified by followers.

Policy implication: identifying those influencers and the risk profile of the news they share is important in predicting the evolution of infodemic risk.
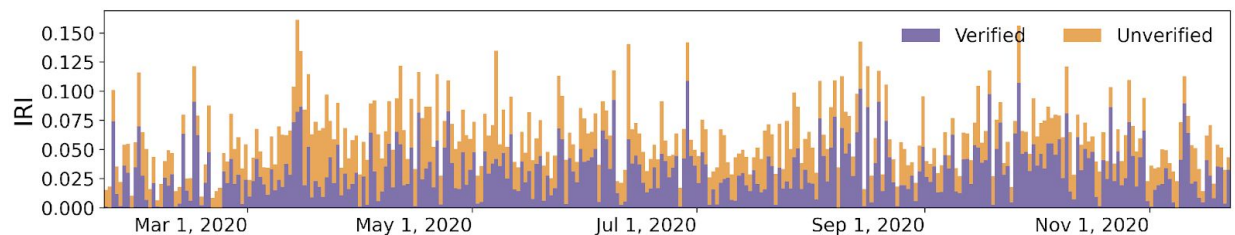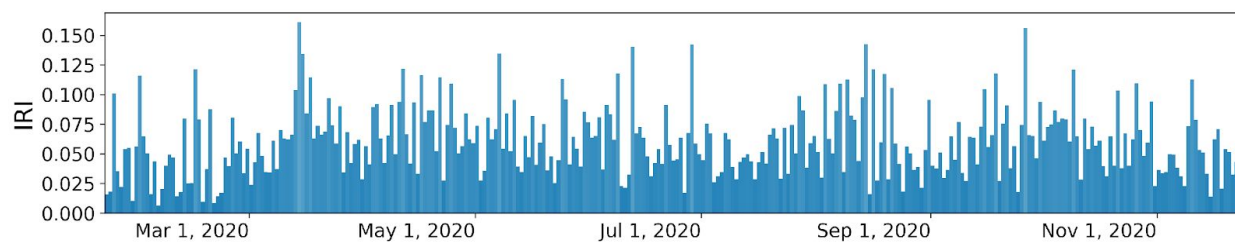
IRI. The pattern of infodemic risk over time is characterized by high volatility with a continuous train of spikes of unreliable information diffusion over a low baseline that that is dominated by the messages of verified influencers with a rather large following, suggesting that the low-risk scenario is not characterized by overall stability but rather by a continuous changes at a daily level, with a potential risk of occasional escalation.

Policy implication: although Spain is not a critical country in terms of infodemic risk, the volatility of misinformation and the heavy role of influences does not grant the absence of sensible effects around specific news. Identifying the categories of influencers that spread misinformative content is crucial to prepare suitable counter-narratives.
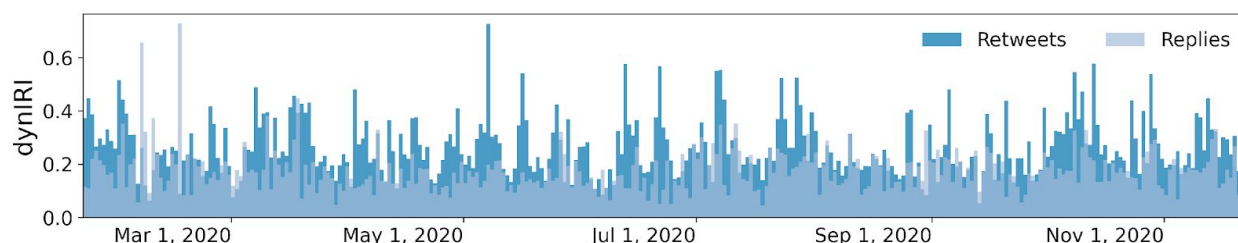
Dynamic IRI.

Focusing on the 'amplification' dynamics, that is on retweets and replies only, the dynamic pattern of infodemic risk shows substantial variability, suggesting a far-from-stable situation despite the relatively low infodemic risk profile, which seems to be open to many possible future scenarios. The values of dynIRI suggest a high engagement with misinformation.

Policy implication: the DynIRI indicator shows that Spain is potentially susceptible to escalating infodemic risk due to high reactivity to misinformation.
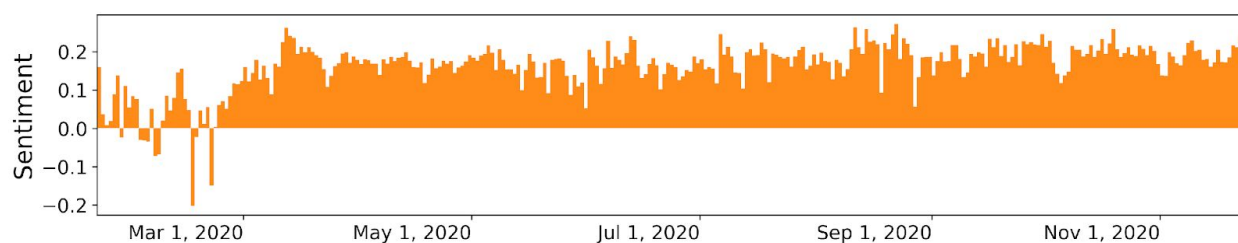
Sentiment. We automatically measure the average daily sentiment of all tweets written in english using the VADER sentiment algorithm, which projects a message sentiment on a scale between -1 (negative message) and +1 (positive message) with 0 characterizing neutral messages. The resulting sentiment time profile shows an initial unstable phase in correspondence with the first local cases, followed by a trend of positive sentiment after March.

Policy implication: the constant deep positive sentiment after the first two months, and the positive nature of the sentiment orientation reflects Spain's profile as a low infodemic risk country.
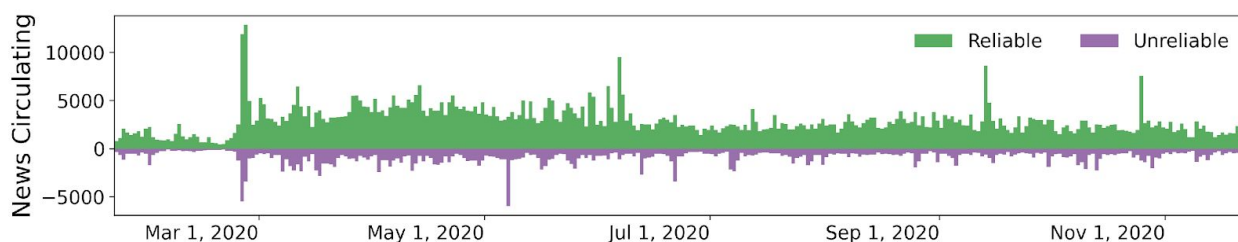

News circulating. The spikes in the activity are mostly due to bursts of reliable news and are characterized by smaller volumes in the earlier days of the epidemics. We do not see any peak

of unreliable news after May, as the flow of reliable news consistently overcomes that of unreliable ones.

Policy implication: The fact that spikes mostly concern reliable sources again confirms the general low-criticality infodemic profile.
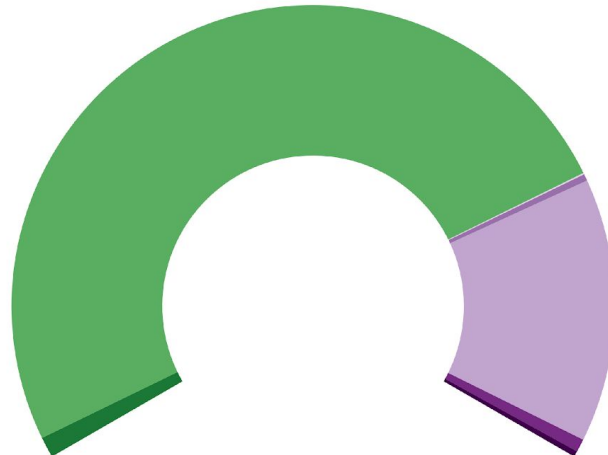
Type of news circulating. The Spanish media landscape is strongly characterized by the dominance of mainstream and politically biassed media, with an appreciable component of scientific media, which almost balances in itself the aggregate volume of fake and conspiracy content. Overall, the content mix of Spanish media reflects the one that could be expected from a country with low infodemic risk.

Policy implication: the fact that misinformation is mainly linked to politically biased content and not to fake/conspiracy content signals that the stabilization of the Spanish situation may largely benefit from a policy of national dialogue and unity across political forces in the public interest.

Correlation with epidemics
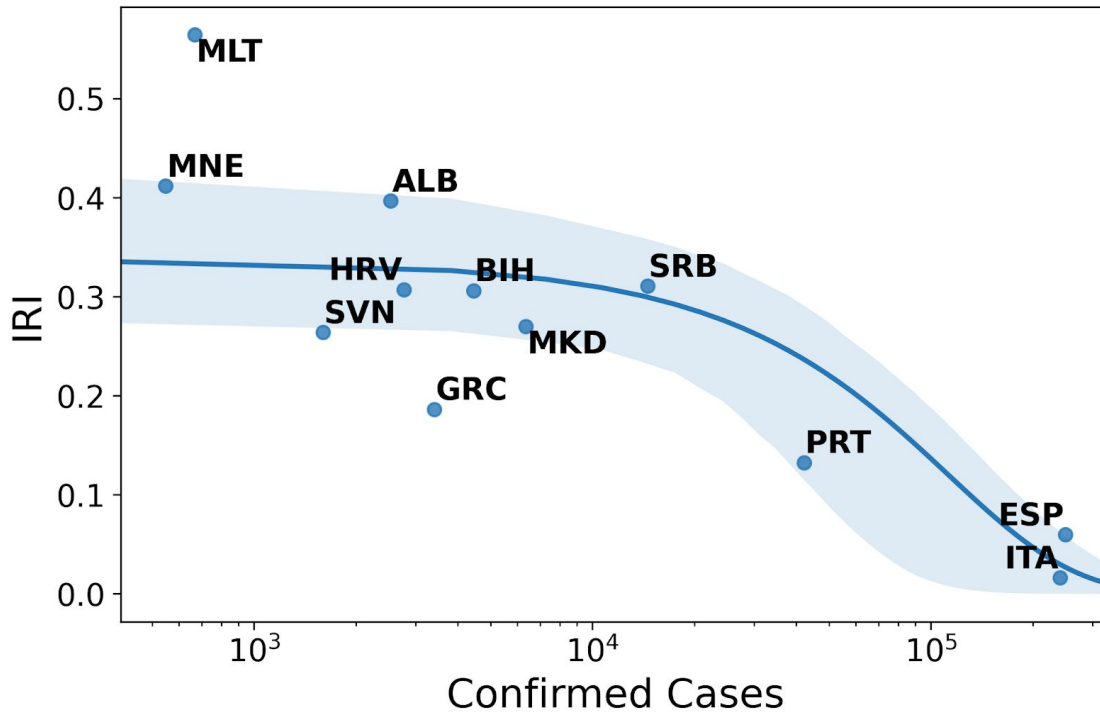
**Anticorrelation of IRI with total epidemic cases in Southern Europe**, November 2020. Placing Spain in the wider context of Southern Europe countries, we observe a characteristic and interesting pattern: a strong negative correlation (0.77) between infodemic risk and number of confirmed cases, that is robust to per-capita adjustments. This seems to suggest that the transition from less reliable to more reliable media sources as the pandemic aggravates is a consistent one in the Southern European region. Notice also how level of infodemic risk is not related to socio-economic conditions, with high income-per capita countries like Malta topping the ranking of infodemic risk (and other high-income countries like Italy sitting at the bottom).

Policy implication: the fact that there is a systematic tendency to lower infodemic risk as the epidemic spreads is an important social stabilization factor, which should be accordingly strengthened through a wider availability of scientifically reliable communication on mainstream media and by giving exposure to experts with good communication skills and appeal, basically countering the action and techniques of misinformation agents on their own grounds.

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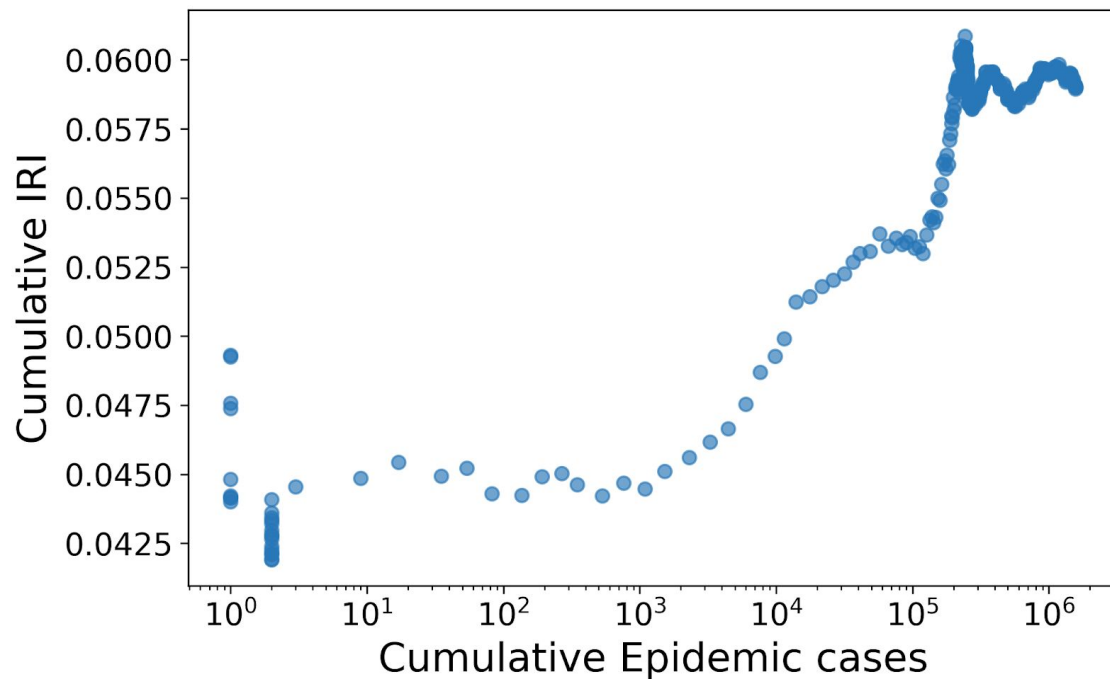
In Spain, as the epidemic spreads the risk of disinformation slightly grew. This graph goes in the opposite direction of the trend highlighted above, in this case for the dynamic evolution of the pandemic in Spain: infodemic risk went up down as contagion spread, until it got stabilized to the current level.

Policy implication: the fact that Spain moves against such a trend, although the effect is of relatively small size, is a cause for concern. This fact signals that the social dynamics of news production and spreading in the country, despite the overall low infodemic risk, presents some subtle fragility that should be attended to. In a context like this, the prescription highlighted above, that is, giving more space to experts in mainstream media and working carefully on their communication skills, becomes even more important, also in view of the fact that the main driver of misinformation in Spain are verified account with a relatively large following, that need to be properly counter-balanced.

Community influencers

News Media | Journalist | Professor | Politician | Public Communication | News Blog
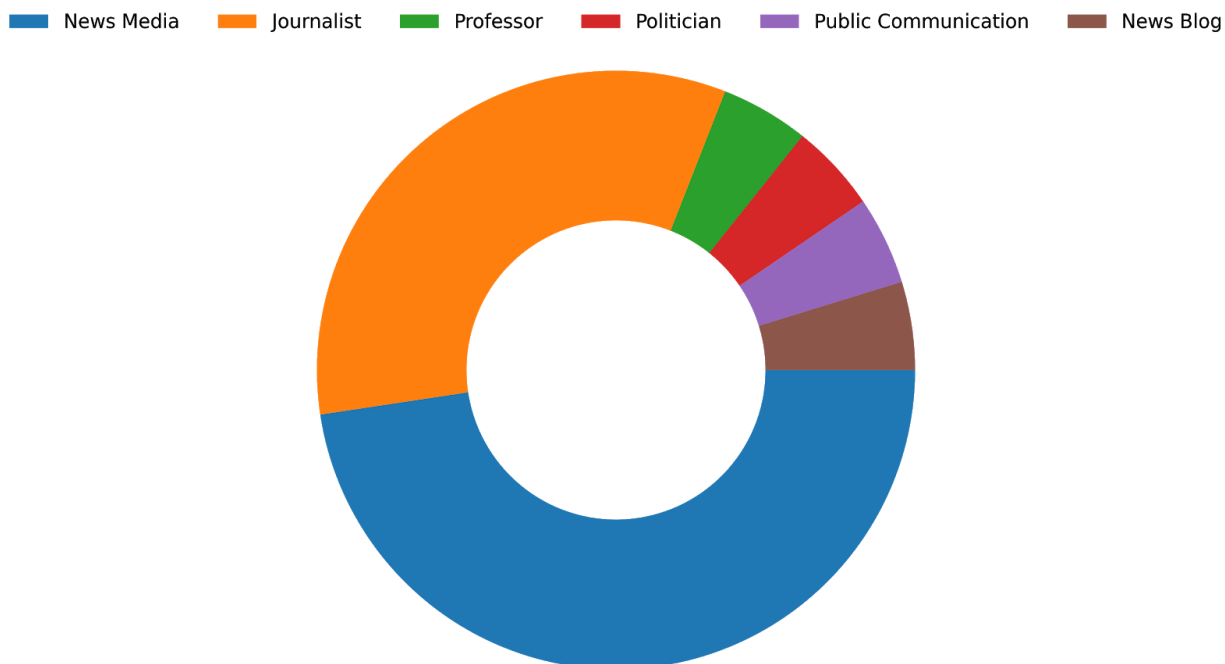
Roles played by all spanish community "community hubs". We analyze the hubs of the communication communities identified over a snapshot of the network in April 2020. Hubs are identified as the 20 members of the community with the larger number of interactions (retweets and replies). A community among those identified is centered around all spanish hubs, but in the chart above we include in the graph all hubs based in spain, belonging or not to the "Spanish" communication community. It is remarkable that the number of accounts labeled as "news media" and "journalist" represent the largest fraction of hubs. As can be read below in the details about the spanish community, most of these accounts have since been suspended.

Top 20 influencers of the Spanish communication community

user handler	strength	url	type	role	ideology
matthewbennett	56466	https://twitter.com/matthewbennett	Human	Journalist	--

ldpsincomplejos	41784	https://twitter.com/ldpsincomplejos	Human	Journalist	--
el_pais	32927	https://twitter.com/el_pais	Institution	News Media	--
eldiarioes	31656	https://twitter.com/eldiarioes	Institution	News Media	--
PabloFuente	24388	https://twitter.com/PabloFuente	Human	Journalist	--
elmundoes	20782	https://twitter.com/elmundoes	Institution	News Media	--
EFEnoticias	16993	https://twitter.com/EFEnoticias	Institution	News Media	--
Alvisepf	16421	https://twitter.com/Alvisepf	Human	Journalist	--
okdiario	15806	https://twitter.com/okdiario	Institution	News Media	--
pmarsupia	15687	https://twitter.com/pmarsupia	Human	Journalist	Left
abc_es	12749	https://twitter.com/abc_es	Institution	News Media	--
VilaWeb	12335	https://twitter.com/VilaWeb	Institution	News Media	--
iescolar	9632	https://twitter.com/iescolar	Human	Journalist	--

SaludPublicaEs	9136	https://twitter.com/SaludPublicaEs	Institution	Public Communication	--
hermanntertsch	8831	https://twitter.com/hermanntertsch	Human	Politician	Far Right
A3Noticias	8773	https://twitter.com/A3Noticias	Institution	News Media	--
juanrallo	8658	https://twitter.com/juanrallo	Human	Professor	--
jatirado_oc	8258	https://twitter.com/jatirado_oc	Human	Journalist	--
20m	8083	https://twitter.com/20m	Institution	News Media	--
publico_es	7192	https://twitter.com/publico_es	Institution	News Media	--

The top influencers in the Spanish media ecosystem are journalists and mainstream news sources, with the rare expectation of intellectuals and politicians. In particular, in most cases journals are not identified by a strong ideological leaning, further suggesting that the influencing effect is more related to the credibility of the source than to polarization or partisanship. This clearly reflects the typical pattern that one expects to observe in a low-risk infodemic environment. In particular, the absence of trolls is especially remarkable. The only exception is represented by a far-right politician.

Policy implication: in a generally favorable situation from the infodemic risk viewpoint, Spain suffers from a lack of top influencers from the scientific field. Especially in cases of health emergencies such as the pandemic crisis, the presence of an authoritative scientific voice is important, because even unbiased journalists are not always able to report accurately complex scientific and medical facts. More attention to the exposure of the public opinion to scientific sources could be given in future policies.

Top shared news

Top 100 news

Top news circulating: The graph shows the relative peculiarity of the Spanish situation, where science sources are practically non-existent and communication is basically split between mainstream sources and politically biased one, with a small incidence of fake and conspiratorial content. This confirms and further reinforces the previous insights. Strengthening the low-risk character of the Spanish scenario would require a more active presence of scientific sources. On the other hand, at the moment fake news do not have a real grip on the Spanish public opinion, and this is a remarkable feature to build further on.

Top 10 unreliable news

Fact Type	URL	Domain	count
POLITICAL	https://www.eldiario.es/politica/fallece-expolicia-billy-nino-covid-19_0_1024697806.html	eldiario.es	5319
POLITICAL	https://www.eldiario.es/sociedad/madrid-confirma-primer-positivo-coronavirus_0_999501133.html	eldiario.es	3663

POLITICAL	https://www.eldiario.es/sociedad/ultima-hora-coronavirus-mundo-espana-19-junio_13_1000679924_49550.html	eldiario.es	3511
POLITICAL	https://www.eldiario.es/sociedad/mucha-fatiga-problemas-para-dormir-y-ganas-de-llorar-los-sintomas-poscovid_1_6084241.html	eldiario.es	2778
POLITICAL	https://www.eldiario.es/internacional/ultima-hora-coronavirus_13_999280065_39110.html	eldiario.es	2713
POLITICAL	https://www.eldiario.es/canariasahora/sociedad/medico-italiano-positivo-coronavirus-tenerife_0_999151062.html	eldiario.es	2107
POLITICAL	https://www.eldiario.es/sociedad/ultima-hora-coronavirus-mundo-espana-15-mayo_13_1000679924_47580.html	eldiario.es	2092
POLITICAL	https://www.eldiario.es/sociedad/ultima-hora-coronavirus-mundo-espana_6_1108630_1051976.html	eldiario.es	2091
POLITICAL	https://www.eldiario.es/sociedad/sanidad-privada-calcula-uci-espana_0_1012449010.html	eldiario.es	2054
POLITICAL	https://www.eldiario.es/sociedad/ultima-hora-coronavirus-espana-mundo-13-de-octubre_6_6287213_1053925.html	eldiario.es	1968

The list of top 10 unreliable sources is entirely made of politically biased news coming from a single source with a recognized left-wing political bias[1], so from the infodemic viewpoint this is a non-critical situation, which can be further improved by an appeal to avoid political polarization on health-related issues in the middle of a health crisis.

Policy implication: at the moment there is not a key unreliable source to watch.

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[1] Labio, Aurora, and Antonio Pineda. "Leftward shift, media change? Ideology and politics in Spanish online-only newspapers after the 15-M movement." *International Journal of Communication* 10 (2016): 22.

Top 10 reliable news

Fact Type	URL	Domain	count
MSM	http://ver.20m.es/6owfh2	ver.20m.es	11043
MSM	http://rtve.es/directo/la-1/	rtve.es	10120
MSM	https://www.rtve.es/v/5590169	rtve.es	8184
MSM	https://www.rtve.es/n/2041631/	rtve.es	5715
MSM	http://ver.20m.es/l3mmc1	ver.20m.es	5568
MSM	https://cadenaser.com/ser/2020/05/29/internacional/1590764224_405885.html	cadenaser.com	4235
MSM	https://www.elconfidencial.com/espana/2020-06-03/muertes-coronavirus-espana-exceso-mortalidad-ine_2622395/?utm_source=twitter&utm_medium=social&utm_campaign=ecdiariomanual	elconfidencial.com	2594
MSM	https://www.elconfidencial.com/mundo/2020-05-22/mascarillas-coronavirus-calor-israel-japon_2603735/	elconfidencial.com	2523
MSM	https://bbc.in/2s5acve	bbc.in	2449
MSM	https://bnonews.com/index.php/2020/02/the-latest-coronavirus-cases/	bnonews.com	2362

The top reliable sources are all from mainstream media, confirming once again the picture previously sketched out.

Policy implication: in Spain, the mainstream media can make a real difference in orientating the public opinion on health-related issues and in facilitating the adoption and diffusion of socially responsible behaviors.

Policy brief

Spain represents one of the least problematic cases in Europe as far as infodemic is concerned. However, there are a few structural weaknesses that require further attention: the lack of influence of scientific sources, the wide diffusion of politically biased news, and the lack of reactivity of the public opinion to high levels of contagion in terms of search for more reliable scientific sources. All these elements, in a favorable scenario such as the present one, should suggest the development of public opinion campaigns that reinforce scientific culture in the public opinion and make it more prepared and resilient to possible future crises.