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Blurred Shots: Investigating the Information Crisis Around Vaccination in Italy

American Behavioral Scientist

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Abstract

This article aims at exploring a case of information crisis in Italy through the lens of vaccination-related topics. Such a controversial issue, dividing public opinion and political agendas, has received diverse information coverage and public policies over time in the Italian context, whose situation appears quite unique compared with other countries because of a strong media spectacularization and politicization of the topic. In particular, approval of the “Lorenzin Decree,” increasing the number of mandatory vaccinations from 4 to 10, generated a nationwide debate that divided public opinion and political parties, triggering a complex informative crisis and fostering the perception of a social emergency on social media. This resulted in negative stress on lay publics and on the public health system. The study adopted an interdisciplinary framework, including political science, public relations, and health communication studies, as well as a mixed-method approach, combining data mining techniques related to news media coverage and social media engagement, with in-depth interviews to key experts, selected among researchers, journalists, and communication managers. The article investigates reasons for the information crisis and identifies possible solutions and interventions to improve the effectiveness of public health communication and mitigate the social consequences of misinformation around vaccination.

Keywords

vaccination, information crisis, health communication, polarization, public relations

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A Scenario of Information Crisis

This article aims at exploring a case of “information crisis” in Italy through the lens of vaccination-related topics. Such a controversial issue, dividing public opinion and political agendas, has received diverse information coverage and public policies over time in the Italian context, whose situation appears quite unique in comparison with other countries because of a strong spectacularization and politicization of such a matter, especially in recent years.

The World Health Organization (WHO) recently included vaccine hesitancy—defined as a delay in acceptance or refusal of vaccines despite availability of vaccine services (WHO, 2014)—among the “Ten threats to global health in 2019” (WHO, 2019). In 2017, an emergency over measles outbreaks across the European Union (EU) rose to their highest levels since 2010 (Organisation for Economic Co-operation and Development, 2018). Italy—where the decline in childhood vaccination has been observed since 2013 (D’Ancona et al., 2018)—was at the center of this emergency, with almost 5,000 measles and 65 rubella cases recorded during 2017 (ISS, 2018a). To counter this trend, in line with the new immunization programs promoted by other EU member states, the Italian Government, run by a left-center coalition guided by the Democratic Party, increased the number of mandatory vaccinations from 4 to 10 through Decree-Law 73, approved in August 2017 and labelled as the “Lorenzin decree” from the surname of the Minister of Health in charge at that time (Chirico, 2018; Filia, 2017). To promote the new legislation about mandatory vaccination, the Italian government launched a multichannel communication campaign, right before the opening of the schools in the national territory, also planned on Ministry of Health social media channels (Facebook and YouTube).

The decision to approve the “Lorenzin Decree” sparked a nationwide debate that divided public opinion and political forces (Casula & Toth, 2018), in this way triggering a complex “informative crisis” and fostering the perception of a real social emergency. This resulted in negative stress on lay publics and the local health system itself, whose agents (particularly, family doctors and operators in vaccination centers) were completely unprepared to multiply both service offering and their daily interactions with citizens.

The League and Five-Star Movement (M5S)—two prominent Italian populist parties (Rooduijn et al., 2019)—declared themselves against the decree. The League repeatedly stated its own contrariety to any form of vaccination mandate, while the M5S expressed more ambiguous official points of view, nonetheless oscillating between “anti” and “free-vax” positions (Casula & Toth, 2018). The two parties promised to abolish the “Lorenzin decree” if they won the forthcoming general elections in spring 2018.

Together with politicization, the vaccination debate in Italy intertwines with the spreading of problematic information about vaccines, mainly online and on social media, especially after the decree. Moreover, in the lead-up to the 2018 Italian election, many concerns were raised about the spreading of misinformation.¹ Minister of Health Lorenzin blamed the “fake news” shared on social media for the Italian vaccine

emergency², and Beppe Grillo (M5S founder) accused *The New York Times* of spreading false information about the alleged antivaccination propaganda by the M5S.³ In early 2018, some initiatives were launched online by several public health organizations and associations to fight misinformation about vaccination: among them, the platform *Dottore è vero che* (“Doctor is it true that”) or *ISS Salute* (ISS Health), a website including a section to counteract hoaxes and health misperceptions (*Bufale e falsi miti*).

Since June 2018, a coalition composed of the League and M5S has been leading the Italian government, based on a “government contract” including a modification of the law on vaccinations, a decision that was criticized by the European Commissioner for Health who underlined the need to counter the spreading of misinformation at EU level.

Given the context outlined above, the Italian debate on vaccinations stands out as a peculiar case study to shed light on the communication crisis affecting Italian society and lay publics. Indeed, in this country, the borders between scientific, political, and problematic information have become blurred over time, in this way contributing to the perception of an epidemiological emergency and enhancing distrust in traditional institutions (Edelman, 2019). How do different kinds of information—mainstream, alternative, political, and scientific—interact with each other and with publics in sparking this information crisis? And what do the main Italian stakeholders plan to do to counter this crisis that has strongly impacted on lay publics’ trust in science and institutions?

From this scenario, this article aims to shed some light on these questions focusing on the vaccination debate in Italy, using a mixed-method approach. First, after reviewing the international scientific literature, the study analyzed a data set of Italian political news on vaccine-related topics shared on Facebook in the lead-up to the 2018 Italian general election. Then, based on the findings of the quantitative phase of the study, in-depth interviews were carried out with key-experts selected among researchers, journalists, and communication managers, representing the main actors involved in the vaccination issue in Italy, to explore further such an information crisis and identify possible solutions for the social consequences of misinformation.

The Vaccination Debate in Italy: When Problematic and Politicized Information Blurs With Health Communication

In recent years, public opinion, institutions, and scholars have been increasingly concerned with the spreading of problematic information, a concept that points to a wide range of communication phenomena, such as for-profit or political-motivated fabrication of false news and misinformation resulting from poor journalism (Giglietto, Iannelli, et al., 2019). Disinformation is generally linked to the so called “post-truth” era we live in, where “facts are less influential in shaping public opinion than appeals to emotion and personal belief.”⁴

In the network society (Castells & Cardoso, 2005), falsehood can spread widely and fast, resulting in serious social consequences. The global risk of massive digital

misinformation raised public concerns especially during the 2016 U.S. presidential election and the British “Brexit” referendum vote. In this context, the strategic use of social media to convey political propaganda and disinformation emerged dramatically (Tucker et al., 2018).

The European Commission (2018a) defined problematic information as a major challenge, and Italy has been pointed out as a country facing serious issues on this matter (Fletcher et al., 2018). The 2018 Italian national election campaign was fueled by political disinformation, despite several initiatives to counter the problem organized by the Italian Government since 2017 (Newman et al., 2018). Furthermore, the Italian Authority for Communications (AGCOM; 2018) highlights that the Italian market of disinformation has strongly raised its impact on the general market of information since September 2017. In particular, the amount of online disinformation has increased from 2% of the total (August 2017) to 10% of the online contents published in the Italian media sphere, strongly influenced by the Italian political election. Within these problematic flows, 20% of fake contents is related to scientific and technological types of topics, ranking in second place for disinformation, behind hard news related to politics and international affairs (57%).

Considering more closely the topic of vaccines, conspiracy theories seem to be widespread in Italy (Mancosu et al., 2017). Indeed, a significant negative correlation has been found between the Italian MMR vaccination coverage and Google research trends and social media activity about vaccination and autism (Aquino et al., 2017). The Italian antivaccination web sphere also includes an increasing number of YouTube videos on vaccines, with those negative in tone that are more shared and liked than others (Covolo et al., 2017), websites (Tafuri et al., 2014), forums (Fadda et al., 2015), and Facebook networks (Comunello et al., 2017; Tipaldo, 2019), which appear to be dominated by the echo-chamber effect, increasing polarization among users’ opinions (Schmidt et al., 2018).

During the 2018 Italian electoral campaign, vaccinations became a political topic (Casula & Toth, 2018). The politicization of the debate on vaccination and its popularization in newspaper and online avenues cross social phenomena such as populist anti-elitism, anti-intellectualism and the related distrust of experts (De Cleen, 2018; Speed & Mannion, 2017), the diffusion of conspiratorial theories (Blaskiewicz, 2013), and the digital disintermediation of health-related information that enable lay public activism (Lovari, 2017; Rosselli et al., 2016).

In a vicious circle, the politicization and polarization of the debate on vaccination, along with the consequent diffusion of partisan views possibly empowered by computational propaganda tools (Broniatowski et al., 2018), can contribute to reducing the lay public’s confidence in scientific and health facts (Iyengar & Massey, 2019), like those supporting vaccination practices.

In the postmodern conception of health (Kata, 2012), misinformation about vaccination blurs and intertwines with mass media and public health communication flows. This overlapping of different voices was deeply influenced by social media logics (van Dijk & Poell, 2013) exacerbating polarization around vaccination, also as a consequence of the consumption of digital contents dominated by echo-chamber effect

(Schmidt et al., 2018). Moreover, public health organizations mostly continue to use social media for one-way, broadcasting information, and not to engage or listen to digital publics (Guidry et al., 2019; Moorhead et al., 2013). This broadcasting use of social media for health communication is also common in Italy (Cioni & Lovari, 2014; Lovari, 2017), although national guidelines would like to enhance a dialogic use to engage citizens and to codesign health policies.

Research Questions and Method

This exploratory study used a mixed-method approach, combining data mining techniques with in-depth interviews with key experts in order to investigate factors and reasons behind the Italian vaccination information crisis and to identify interventions to fight against misinformation. Researchers drew independent preliminary conclusions from both quantitative and qualitative analyses. Research activities and findings were shared and discussed over numerous meetings.

To analyze the vaccination topic in the political media agenda, the study relied on the Mapping Italian News (MINE) data set (Giglietto, 2018), which comprises 84,815 URLs of political news stories published by 4,113 online news media sources in the 6 months before the 2018 Italian election. The news stories were collected through a technological infrastructure programmed to gather, in real time, political news articles from Google News, GDELT, and Twitter. Each news URL in the data set is enriched with a headline, a brief description and Facebook engagement metrics observed after a week from the publication of the news—information extracted through the Facebook Graph API—and data indicating the party and politicians mentioned in the news—detected through the Google Cloud Natural Language API (Giglietto, Righetti, et al., 2019).

The analysis looked for news stories on vaccines in the MINE data set through keyword searches.⁵ Using the software *Iramuteq*, a descending hierarchical classification followed by factorial correspondence analysis was implemented to explore the content of these stories. The analysis allowed the authors to classify 492 news stories (72.35% of the total) into three classes. Each of these three classes was analyzed in relation to Facebook comments, shares, and reactions (users' engagement).

Given the skewness of the data, using R software, the study utilized nonparametric tests to test statistical differences in the engagement (Giglietto, Valeriani, et al., 2019) between the classes (Kruskal–Wallis test followed by a Dunn's test) and to analyze the engagement differences between explicitly political and nonexplicitly political news stories (Mann–Whitney *U*). “Political news” was defined as that which mentioned a politician or a party, and “nonexplicitly political news” that which did not mention any politician or party.

Last, to ascertain the presence of problematic news domains in the data set, the study checked them against those included in the black-lists of three Italian debunking websites already used for this purpose (Fletcher et al., 2018).

In summary, this first section of this study was driven by the following research questions:

Research Question 1: How many political news articles on vaccine-related topics were published by online media in the lead-up to the 2018 Italian general elections?

Research Question 2: What topics characterized the online media coverage of vaccines? Which vaccine-related topics gained more engagement from Facebook publics?

Research Question 3: Are there, in the data set of news about vaccines, problematic news articles, such as news reporting false information aimed at discrediting science and institutions, as well as problematic news sources already known for publishing untrustworthy news stories?

In the second stage of the empirical study, both the insights collected from the literature review and the evidence found by the mapping of the Italian marketplace of news around vaccination were critically discussed with a panel of opinion leaders, representing different key stakeholder groups acting in the Italian vaccination arena. The study involved experts from the major public bodies responsible for health care, sector associations, and private research centers promoting several initiatives to face the information crisis related to vaccination in Italy. Communication managers collaborating with pharmaceutical companies were also interviewed, as well as science and health journalists operating to fight health-related misinformation both on and offline.

The research questions that guided the in-depth interviews were as follows:

Research Question 4: What are the factors that contributed to the information crisis concerning vaccination in Italy? What was the role of politicization in increasing both visibility and disinformation around vaccination?

Research Question 5: What communication strategies might help counteract the state of disinformation and information crises around vaccination among the lay publics? What might be the most relevant actions to be taken in facing those problems?

Overall, six in-depth interviews were collected in December 2018 with national key experts: two independent health journalists, one researcher in public health communication, and three communication managers employed in research centers and health-related associations. The interviews were conducted via Skype or in presence, lasted on average 73 minutes and were transcribed and analyzed using an interpretative approach (Huberman & Miles, 2002). Interview transcripts were discussed by the researchers, who proposed explanations to resolve discordant assumptions about the research questions of the study.

Main Findings

The Vaccination Debate Between Online Media and Politics

In the long run-up to the 2018 Italian general elections, vaccines represented a subject matter for discussion at the intersection between political arena, online media, and

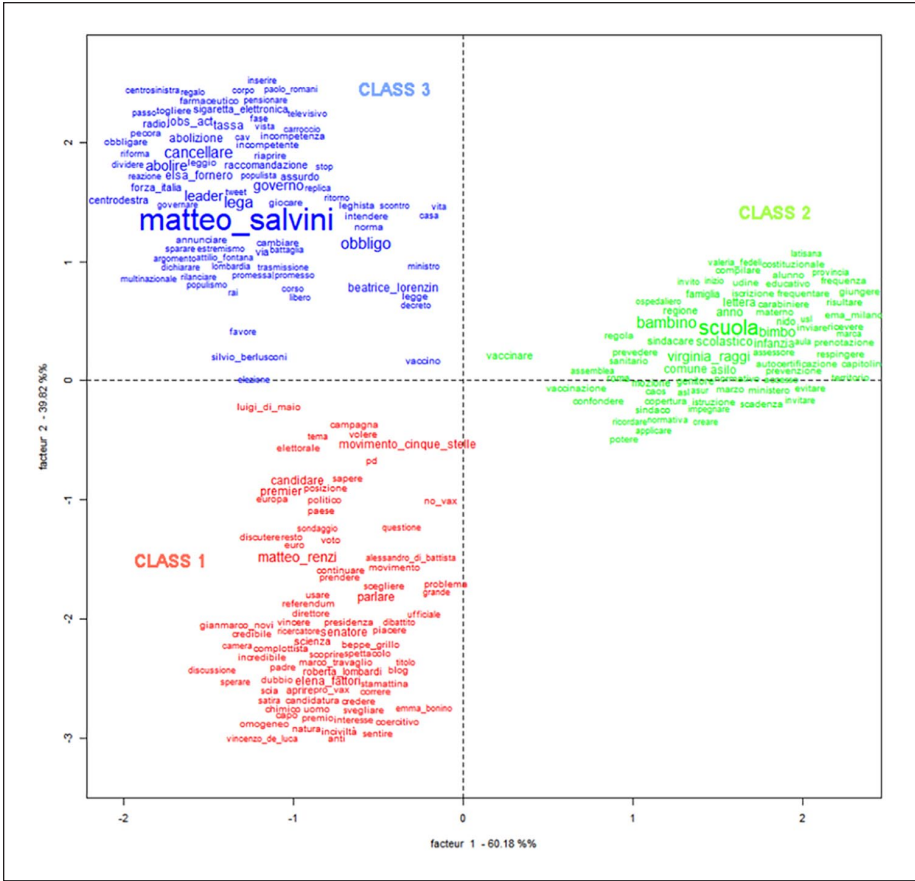


Figure 1. Factorial correspondence analysis of the news stories on vaccines.

Facebook networks: 680 news stories dealt with vaccination, representing 0.8% of the total news collected by the MINE project. This news totaled 644,069 Facebook interactions, including 356,101 reactions, 213,616 comments, and 74,352 shares.

The news items were classified into three lexical classes arranged around two factors organizing the semantic space (Figure 1). The first factor explains 60.18% of the total variance and separates news stories about national political debate on vaccinations and the “Lorenzin decree” (Class 1, 28.7% of the total classified news articles, $n = 141$ news articles; and Class 3, 31.5%, $n = 155$), from those about the decree’s social consequences on schoolchildren, parents, and health organizations (Class 2, 39.8%, $n = 196$). The peak in news coverage and Facebook engagement in early September 2017, when the Italian school-year started, was due to the latter class (Figure 2): in compliance with the “Lorenzin decree,” children without the mandatory

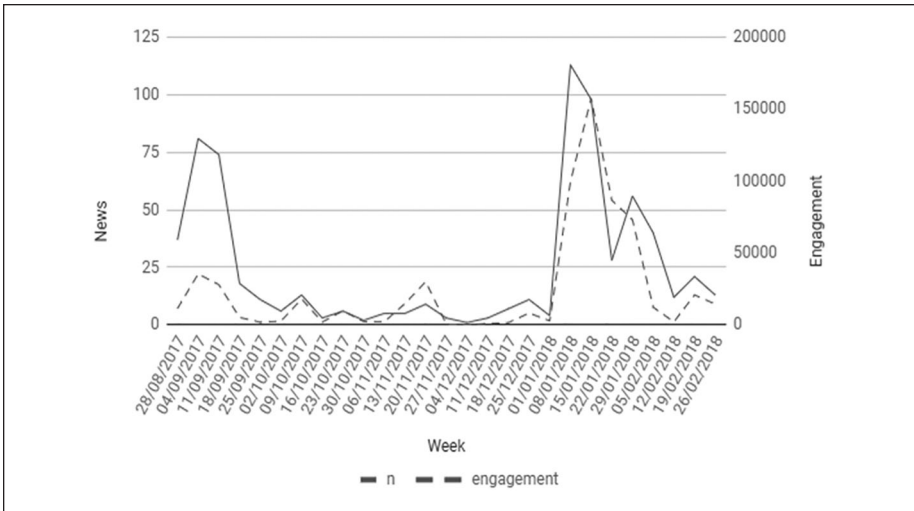


Figure 2. News coverage and Facebook engagement by week in the 6 months before the 2018 Italian elections.

vaccination certificates were not admitted to school, in any case fostering no-vax parents' protests.

The second factor explains 39.82% of the variance. It distinguishes news articles with a predominant pro-vax voice (Class 1, and partly Class 2) from those reporting disagreements about the "Lorenzin decree" (Class 3 and partly Class 2). The first class mainly represents the political clash between the Democratic Party and the M5S. In these contexts, the vaccination issue appears primarily as a political means for attacking adversaries. The third class was the one mainly responsible for the highest peak in news coverage and Facebook public's engagement, which arose in January 2018, in coincidence with the growing news flow on the election campaign (Figure 2). In this case, the coverage focused mainly on the "Lorenzin decree," as well as the renewed promises about its abrogation by the League and M5S leaders, and other political disputes about vaccine-related topics. This peak and the one in September 2017, account for about 66% of the total news and 75% of the Facebook engagement in the topic.

Considering the median engagement of the three news classes, the most engaging was the first ($Mdn = 203$), followed by the third ($Mdn = 153$), while the least engaging was the second ($Mdn = 34.5$). A Kruskal–Wallis test pointed out that the engagement difference is highly statistically significant, $\chi^2(2, N = 680) = 28.13, p < .001$, and a Dunn's post hoc test revealed that the engagement of the first and third classes are significantly higher than the second ($p < .001$), regarding the social consequences of the "Lorenzin decree." Since the first and the third classes differ from the second for the more explicit political struggle they represent, these results seem to suggest that

the more explicit the political struggle, the higher the engagement of Facebook publics with vaccine-related news stories.

More generally, the politicization of the vaccines issue in Italy seems to have facilitated the propagation of problematic information through both alternative and mainstream news sources. There is, indeed, problematic news published by mainstream media reporting the League's leader's statements on vaccines and the role of pharmaceutical companies: "I would not like Italy to have been chosen as a 'guinea pig' by pharmaceutical companies," reported *Corriere della Salute*. Analogously, *RaiNews* wrote, "The League's leader [. . .] on vaccines: '10 vaccines are potentially risky to health,'" a statement debunked as scientific disinformation.⁶ Therefore, though politicians' statements apparently aimed at courting the no-vax vote, conspiratory and pseudomedical theories reached mainstream media and, possibly, a wider range of people and voters. Besides mainstream media, the data set also comprises a news article published by a conspiracy-theory website described as a pseudoscientific source (Fletcher et al., 2018): "Vaccines: Here's how many victims of vaccines have been indemnified by the state!" There is also news that accuses the government of conspiring with pharmaceutical companies and a news story, published by another pseudomedical website (Fletcher et al., 2018) that criticizes the exclusion of vaccinated children from school. Overall, about 2% of the news on vaccine-related topics in the analyzed data set was published by problematic news sources, accounting for about the 4% of the news domains that wrote at least one news article about vaccines in the lead-up to the 2018 Italian general election.

The results suggest that politics may have a major role in spreading information as well as misinformation on vaccines, both directly and by opening the door to pseudo-scientific and conspiratorial content (Blaskiewicz, 2013; Mancosu et al., 2017; Tipaldo, 2019) published by problematic news sources. Within the limits of the available data, this hypothesis was tested by comparing the median engagement of the group of news articles on vaccinations that mentioned a political party or a politician with the group of news that did not mention either of them. Findings show that the explicitly political news stories have a Facebook engagement ($Mdn = 138$) significantly greater than the not explicitly political group ($Mdn = 33.5$): $N = 680$, $W = 38375$, $p < .001$. Coherently, considering together the first and the third news classes, which are more explicitly political, the study found that their median engagement ($Mdn = 167$) is higher than that of the second news class ($Mdn = 34.5$), more focused on the social implications of the "Lorenzin decree" ($n = 492$, $W = 20862$, $p < .001$). Thus, the politicization of the vaccination issue seems to have improved publics' engagement with a topic traditionally bound in the field of scientific debate.

Listening to Experts: Exploring the Reasons for the Information Crisis

During the interviews, the respondents highlighted the main factors that produced the information crises around vaccination in Italy, focusing on social actors who trafficked problematic information on this topic.⁷ These factors are strictly intertwined, creating

a state of information overload about vaccination that impacted on lay people's information seeking practices (Kim & Krishna, 2014) and on the news media, fostering misinformation, with significant social costs for a country characterized by low levels of health literacy (Palumbo et al., 2016).

First, the politicization of vaccination was considered by the experts a trigger to the visibility of the topic online and, more generally, in the media. Such visibility led to a deeply polarized and controversial framing of vaccination, which became a divisive political issue in the Italian public debate, from the approval of the "Lorenzin decree." All the interviewees highlighted how this trend was very negative: confirming the evidence that emerged from the quantitative analysis, the politicization process amplified the spreading of contrasting information around vaccines in order to polarize opinions and to gain votes in the forthcoming election, regardless of the undeniable social value of vaccination. Definitely, according to our respondents, vaccination and in general science and health should not be divisive, as reported in this interview excerpt:

Risks of politicization of science are very high. It was very evident on vaccination, but it's also undeniable on other scientific and para-scientific topics. It's harmful. It increases unreliability towards science. Science is impartial. It's regulated by scientific rules not by political ones. (KR1)

The presence of politicians in the vaccination debate amplified media attention, and the topic was spectacularized according to media logics. Vaccination went beyond the scientific and health experts' community to become a lay topic to be storified and discussed controversially: for example, in afternoon talk shows where doctors' and scientists' voices clashed with those of celebrities and antivax representatives, usually without any mediation of specialized science and technology journalists (AGCOM, 2018).

In the contemporary hybrid media ecologies, such controversial contents quickly spread online. The growing role of social media in Italian media consumption patterns was another factor that nurtured the information crises around vaccination. Antivax movements were less numerous in Italy than in other countries, but social media increased their visibility disproportionately. Indeed, antivax movements were able to use the web strategically, becoming an activist public (Grunig, 1997; Grunig & Hunt, 1984), capable of raising awareness on their issue, making it a visible and mainstream one:

No-vax make a lot of noise. Their communication is strong and aggressive. They were and are very active on social media. They also attracted the attention of foreign press this summer, portraying Italy as a no-vax country. (KC1)

The approval of the "Lorenzin decree" and its politicization by both the government and opposition parties fueled the debate on social media, hybridizing partisan and disinformation contents with scientific and institutional voices. This melting pot of controversial information was amplified by the digital publics' communication practices (Comunello et al., 2017) and by the media that frequently drew from social

media conversations to craft their articles about vaccination. A peculiar turning point in this debate was represented by the rise of several online influencers among whom, first of all, Roberto Burioni, a professor of microbiology and virology who started to intensively use social media in order to affirm the central role of science, fighting against misinformation, and false opinions about vaccination online. Burioni quickly gained visibility on digital and mainstream media, turning into an influencer who gained credibility and trust among hesitant persons. Respondents highlighted the importance of having a qualified visible actor in the digital realm in that particular phase of the debate, intoxicated by disinformation flows. However, several key experts criticized his assertive tones and conflictual communication strategies, claiming that they could increase the polarization between pro- and no-vax movements and the confusion among the lay publics.

Moreover, respondents underlined the insufficient voice of public health institutions, especially in the most acute period of information crises, and particularly on social media, where these organizations were unable to face the growth of misinformation flows around vaccines. This process enhanced the distrust in traditional institutions on this topic:

There is little trust in institutions. Many Italians think institutions intentionally lie and modify data for their own convenience. This is an incredible bias, since citizens don't trust institutions or journalists. There is the doubt of intellectual honesty related to mass media and there is no respect or trust as instead happens in other countries. This distrust is so evident today since everybody can have a voice on Facebook. (KJ1)

The limit of public health communication is to be perceived as very far from the lay public. There is the perception that the state has the interests to communicate what it prefers, while independent information diffused by no-vax on social media brings the truth. (KC1)

Interviewees mentioned several projects (i.e., *Dottore è vero che, ISSalute*) created at the beginning of 2018 by different institutional players and medical associations to stop the public controversy about vaccination, blocking the spreadability of health-related hoaxes and pseudoinformation. These projects limited the “loneliness of the lay publics” (KC2) on the web. However, due to the shortage of coordination between political, medical, and pharmaceutical actors, lacked the efficacy that could have sprung up from a well-structured network.

An Exit Strategy From the Information Crisis

The last section of the study aimed at formulating solutions for increasing immunity to misinformation among the lay publics. Therefore, interviewees were invited to focus on how to oppose the current state of social anxiety and informative crisis concerning vaccination in Italy.

Key experts converged on several prerequisites and public health communication opportunities—particularly, the strategic relevance of listening and the role of local

opinion leaders—to ensure quality information on vaccinations and support a more well-balanced climate and debate.

Interviewees report the importance for public health institutions to diffuse accurate information about vaccination to restore credibility and closeness to citizens; finally overcoming the communication voids of the past and the overcommunication processes triggered by the “Lorenzin decree.”

According to some interviewees, a data-driven approach to communication can effectively support processes of public opinion with experts’ points of views grounded on scientific evidence, avoiding simplification and also considering the most controversial aspects of the debate. This could help face the special informative expectations expressed by no-vax and hesitant people (European Commission, 2018b; WHO, 2019). However, the interviewees agreed that a quality messaging flow represents a necessary, but not sufficient prerequisite to contrast disinformation among the lay publics. Indeed, to accomplish this goal a dialogic and symmetrical communication model is needed (Grunig & Hunt, 1984) involving public health organizations, mass media and opinion leaders acting on the territory.

In particular, key experts identified the need for institutions to integrate quality information flows with more empathetic communication, in order to tune in with the requests of families, respecting their doubts faced with health choices concerning their kids:

We need communication which is not limited to arguing for vaccination on a rational level: indeed, numbers and scientific evidence are not effective against a confirmation bias effect. On the contrary, we need to engage in a dialogue on a more emotional level: this is the opportunity discovered, for example, by those pro-vax families challenging no-vax people in their own field, that of social media. In other words: fewer numbers and more heart. (KR1)

Furthermore, all the interviewees underlined the relevance of listening to the publics—engaging them in research, dialogue, and conflict management—in order to support the implementation of public health policies before, while and after decisions are made. According to all interviewees, listening, empowered by digital platforms and traditional channels, should be promoted by all the vaccination key actors and especially by public health organizations:

Listening could act as a real form of therapy, healing Italian lay people’s doubts and fears and helping to resize the perceived “emergency climate” concerning vaccination. (KC2)

Despite the opportunities offered by digital media, key experts involved in the panel denounced a dramatic lack of listening in an Italian scenario, which nowadays appears dramatically similar to a “tower of Babel” where too many agents are enabled to express their voices and opinions, while only a few are listening to the fears and doubts of both opinion leaders and the lay publics about vaccination:

I do believe we suffered a lack of listening. On the web, communicators should be capable, first of all, of listening and interpreting people’s fears and questions: that means,

primarily avoiding standing in a vertical, asymmetrical position towards the public, as well as refusing an aggressive approach to communication. Listening and interpreting, fearing to engage in a dialogue: this is what we need to do. (KC3)

Interviewees also underlined the relevance of personal networks and the crucial role played by local opinion leaders mediating the public information flow toward the lay publics. Family doctors and health professionals working in vaccination centers, together with other mediation agencies, such as primary school, should invest in programs to improve digital literacy and to teach students the opportunities and threats of using social media, in general and specifically for health issues. Interacting with citizens and families on a daily basis, those actors can contrast disinformation with dialoguing, answering the lay public's questions and sharing correct information about vaccination choices also by using informative contents and resources, which are increasingly available online, in a focused way:

It's important not to beat their ignorance in the face of persons, but rather to enter empathy. That is due, first of all, to family doctors and pediatricians. We need to understand to what measure those figures perceive their own responsibilities as communicators nowadays and how, instead, they delegate them to others, especially media and journalists. (KJ2)

Experts suggested cultivating a counseling role by those actors, by means of training initiatives promoted by public organizations, health associations, and pharmaceutical companies. In this way, all the key actors could engage in a collaborative and networked communication policy, which appears to be so necessary, but still missing, in the Italian scenario today.

Conclusions

According to the most recent international survey promoted by the EU about the state of "vaccine confidence" (European Commission, 2018b), Italy stands among the group of member states, which since 2015 have become more confident in the safety and effectiveness of vaccines, in this way gradually overtaking the phenomenon of vaccine hesitancy. Indeed, the cases of both measles and rubella appear greatly reduced in 2018 compared with 2017 (ISS, 2018b). Such evidence shows a positive recovery of national vaccination rate after the decrease registered from 2010 (OCSE, 2018[**AQ: 1**]), also as a consequence of the national immunization program promoted by the Italian government.

At the same time, data about citizens' sentiment and perceptions describe a still controversial scenario, in line with problematic European attitudes toward vaccination, its social relevance and safety, as the one recently depicted by the first Eurobarometer survey dedicated to the topic (European Commission, 2019). Indeed, a relevant sector of the Italian adult population (about 20%) denies the importance of vaccines (25%), in particular for adults (23% among those who did not receive a vaccination in the past 5 years), as well as the relevance of MMR vaccine for children

(European Commission, 2018b). Opinion surveys also testify a high level of parents' skepticism related to vaccination effectiveness and safety (Giambi et al., 2018). In particular, the exposure to both traditional and digital media coverage about vaccination appears stronger than in other European countries, while the relationship with family doctors and pediatricians, as primary sources of information, results weaker in Italy (European Commission, 2018b).

Furthermore, Italy ranked first in the "misperception index" (Ipsos MORI, 2018), surpassing countries like the United States and France. The reasons why Italians are wrong on key facts about their society (including vaccination) is explained in a mix of factors, like the education system, the nature of media and politics, the levels of trust and attitudes to government, and the emotional expressiveness of the country. Thus, in a general framework characterized by a growing distrust of traditional institutions (Edelman, 2019) and by a postmodern paradigm questioning the authority and credibility of science and health (Kata, 2012), the so called "Nimbo syndrome" seems to grow in relevance (Tipaldo, 2019), where Nimbo stands for "Not In My Body," to highlight the lay publics' act of challenging vaccination in a constant tension between individualism, institutional distrust and narcissistic reactions, mostly disclosed in digital environments.

In this context, the topic of vaccination in Italy represented a rampant issue that quickly gained visibility and controversy in contemporary communication ecologies. The information crisis can be considered the outcome and consequence of several drivers: an extreme politicization of vaccination-related issues after the "Lorenzin decree," a new visibility driven by politicians and mass media, as well as by online influencers; a very active use of social media by no-vax movements; ineffective public health communication interventions; and, last but not least, an inadequate response by local health systems in delivering vaccination information and services.

In the Italian marketplace of ideas around vaccination, public health institutions were not able to have a strong and competent voice in order to face misinformation and the state of emergency perceived by the lay publics. Differently, politics succeed in polarizing the public debate around vaccination on traditional and digital media (Casula & Toth, 2018), contributing to amplifying misinformation or partisan information on the social web. Bridging between conspiracy and pseudo-scientific theories, on the one hand, and media, on the other hand, politicization conveyed ideas otherwise bound to a niche, triggering the interest of the online publics and thus contributing to the deepening of the information crisis witnessed around vaccination in the country.

In such a problematic context, Italian health institutions can however play a strategic role. In particular, it appears crucial to invest not only in a mediated communication and messaging strategy (Grunig & Hunt, 1984), disseminating quality information and pushing public health campaigns to citizens. All the actors should adopt a relational or *behavioral strategy* (*ibidem*), based on research, dialogue and listening to the stakeholders. In this perspective, a central activity is to engage and activate local opinion leaders mediating social knowledge and perception by the lay public about this controversial issue. Such a relational approach seems to be the one always chosen by pharmaceutical companies; indeed, still before the "Lorenzin decree," they offered a

relevant example of corporate agenda building and corporate political advocacy processes (Chatterji & Toffel, 2018; Gaines-Ross, 2017 **TAQ: 21**).

A new approach should also be developed and applied by public health organizations for the social web in order to decrease polarization of opinions, inherently shaped by filter bubbles and rooted in confirmation bias (Schmidt et al., 2018), and to have a clear and credible digital voice, fighting and mitigating misinformation around health issues (Lovari, 2017; Vraga & Bode, 2017). Furthermore, mass media should reconsider their strategies, normalizing their practices according to the social media logic, giving more voice to journalists specialized in science and technology topics (AGCOM, 2018), in order to reposition such topics in a more credible framework, supported by data and numbers (Parrott, 2009), and less spectacularized merely to gain clicks and likes.

In this context, a new role should be played by digital. Indeed, some digital companies have recently added their voices to the debate around vaccine misinformation, changing their policies and guidelines to fight the spread of controversial contents about vaccination, and to respond to the strong pressures by public health institutions, as well as medical professionals and lawmakers. For instance, Pinterest recently decided to block all searches for the term “vaccines,” whether the results are medically accurate or not, to protect users from misinformation observed in many images and photos. In January 2019, YouTube said that it was beginning to remove videos with “borderline content” that “misinform users in harmful ways.” In March 2019, Facebook decided to tackle vaccine misinformation announcing specific interventions, likewise reducing the ranking of pages and groups diffusing misinformation in news feed and search, rejecting sponsored contents that include misinformation about vaccinations, and “exploring ways to share educational information about vaccines when people come across misinformation on this topic.” Last, in May 2019, Twitter launched new search tools meant to help users find reliable source about vaccines, stopping autosuggesting search terms that would lead the online public to misinformation.

In the so called “platform society” (van Dijck et al., 2018) these interventions show how digital companies feel their own responsibility in spreading misinformation about vaccination, due to the nature of their algorithms that select and make visible specific contents, potentially increasing polarization and partisanship, thus enhancing the information crisis. Therefore, digital platforms have to take a clear position in such a global debate and respond to the increasing pressures from public health institutions, organizations, and governments, motivated to stop the spreading of misleading information about health and science that can have strong economic impacts and effects.

To investigate such a complex topic as vaccination, this study adopted an interdisciplinary framework, including political science, public relations, and health communication studies, as well as a mixed-method approach, combining data mining techniques related to news media coverage and social media engagement, with in-depth interviews to key experts. This approach could be further developed to investigate the complexity of social issues by integrating computational analysis with qualitative methods, in order to deepen social meanings and sense-making processes

from big data. The case study also presents some limitations, as it involved only a selected group of key informants in Italy, not including, for example, any foreign observers or systematic international comparisons. Further comparative studies should take into consideration, besides the different health care systems, the cultural differences involved and how those affect both social media engagement rates and public health messaging strategies.

In conclusion, this exploratory research offered an observatory to investigate information crises on vaccination and to identify possible preventive actions. Such measures could avoid lay persons getting lost in an informational paradise, which often turns into an informational hell due to the discordant and controversial voices.

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Notes

1. <https://www.nytimes.com/2017/11/24/world/europe/italy-election-fake-news.html>
2. https://www.corriere.it/cronache/17_maggio_12/vaccini-lorenzini-emergenza-generata-fake-news-06d0fca8-367d-11e7-94ce-afebf1f6f61a.shtml
3. http://www.ansa.it/english/news/politics/2017/05/03/grillo-accuses-nyt-of-fake-news-3_0a545a74-fc5c-4ba2-908f-6f82fb72fe9a.html
4. <https://en.oxforddictionaries.com/word-of-the-year/word-of-the-year-2016>
5. The following keywords were used: “vaccin*,” “quadrivalente,” “trivalente,” “esavalente,” “morbillo,” “rosolia,” “Wakefield,” “legge lorenzin,” “decreto lorenzin” “anti vaccinismo,” “anti-vaccinismo,” “antivaccinismo,” “anti vaccinist*,” “anti-vaccinist*,” “antivaccinist*,” “anti vax,” “anti-vax,” “antivax,” “no vax,” “no-vax,” “novax,” “free vax,” “free-vax,” “freevax,” “popolo arancione,” “vaxxed.”
6. <http://www.butac.it/10-vaccini-insieme-rischio-enorme-salvini/>
7. In order to guarantee anonymity, sentences pronounced by the respondents are reported with “KJ” when referring to journalists, “KC” to communicators, “KR” to health researchers. A number is associated to each respondent (e.g., KJ1, KC2, KR1). The interviews were conducted in Italian. The excerpts quoted in this article have been translated into English by the authors collegially.

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Author Biographies

[AQ: 6]