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The Vaccine Is Now Here. The State-Regions Governance Between Converging Plans and Diverging Digital Communication

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Abstract: This article aims to present an analysis of State-Regional governance in relation to the Italian vaccination campaign, with the objective of identifying possible elements of divergence and convergence on three points. The first refers to the *regulatory dimension* of the campaign, which ensures the management plans of the national campaign and individual regional plans. The second relates to the *implementation area* of the provisions concerning data on allocation and distribution of both vaccines and vaccinated people. The third, instead, concerns the *institutional communication of vaccines* on Facebook institutional profiles. It introduces an analysis of public communication on the anti-Covid-19 vaccine, from December 20, 2020 (a few days before the start of the campaign) to June 30, 2021, six months after in a moment in which the numbers of contagions were beginning to show a definite containment. It examines the central level of communication, i.e., the communication campaign of government actors, and the regional level, i.e., the institutional communication of regional Governors through their respective social profiles. Facebook posts were extracted via API programs and analyzed by a quantitative content analysis. The results show an institutional scenario that goes in two directions. In opposition to a normative and implementation level that is more coherent and less divergent, there is an extremely fragmented communication context with elements of contradiction between State and Regions. The latter would respond to primarily political logic (at disagreement with the governing coalition) to claim intervention priorities and-in implementation-to change the local territorial allocation of vaccines. The communication dimension thus turns out to be a very relevant component of vaccination governance mechanisms: not decisive for the actual implementation of the campaign, but very functional for the creation of new storytelling and thus likely political consensus.

Keywords: digital methods, Italian vaccination campaign, health and pandemic governance, social media analysis of institutional communication

Introduction

The Covid-19 pandemic has revealed the intricate nature of multi-level governance systems. In anti-emergency policies, the state and regions have not always maintained a common approach. This could be among the causes of the drivers of the dramatic outcomes of the pandemic (Garavaglia et al., 2021, Nicola et al., 2021). More frequently, this complexity has had a communicative expression, in the arena of social media, where the difference between personal, political and institutional communication is now highly fuzzy (Calise, 2011; Rega & Bracciale, 2018; Solito, 2018). Among the tension elements between State and Regions there is, in addition to the unclear attribution of responsibilities in the decision-making circuit of the emergency, also the supposed different allocation of resources.

This emergency has shown us how important it is for the policymakers to take quick decisions and that need to be adequately communicated. On the other hand, one of the problems that the literature has repeatedly highlighted is people's bias perception about the main issues of the pandemic (Boccia Artieri et al., 2021; Punziano et al., 2021). The consequences are not insignificant: *infodemia* and the circulation of fake news are only a few examples among them (Di Lisio & Trezza, 2021; Guarino et al., 2021). The vaccination campaign is, from an emergency perspective, a crucial policy strategy. It has the potential to reduce or even stop the circulation and consequences of the virus in the long term. Creating the conditions for good governance should therefore be a priority. The handling of the emergency has involved several institutional levels (national and regional above all) creating a multi-level governance within the decision-making process. As is well known, this could imply difficulties in the management of policies (Kazepov, 2010; Benhke et al., 2019). It is undeniable that part of the critical effects of the pandemic can be attributed to the decentralization of some health decisions (Dodds et al., 2020). This has created non-homogeneous scenarios in Italy. In this article, the study of vaccine campaign governance in Italy was limited to the plans most involved in the decision-making process, which are the national plan and those of five Italian regions, Lombardy, Veneto, Lazio, Campania, and Apulia. These five regions were chosen, primarily, according to the severity of the Covid-spread rate among the Peninsula in the second wave of the emergency (ISS, 2020), thus for reasons of geographic distribution of the virus. Secondly, because the governors of these regions represent all major political parties in Italy, therefore, it is assumed that these reflect the political agendas and priorities arrogated by each faction. For each plan, three scenarios have been analyzed: regulation, implementation, and communication. Regulation is defined here as the set of national rules and their respective regional declinations that regulated the campaign. Implementation

is mainly concerned with vaccine distribution on the ground. And finally, communication, understood as institutional communication on social media was declined through political leaders' communication on vaccination. The assumption is that communication is fully part of the governance processes of a policy, and in the case of the vaccination plan it played a non-marginal role.

The first two scenarios, implementation and communication do not represent only a contextual analysis. In a perspective of methodological mixed-methods design aimed at achieving integration (Amaturo & Punziano, 2016; Teddlie & Tashakkori, 2006), the regulatory and implementation scenarios of the vaccination campaign were components of the analysis that, together with the social communication of national and regional actors, helped us to understand the divergences and convergences of the multilevel governance of the vaccine in Italy. The regulatory framework mainly describes the national and regional *plan of the campaign*, dimension that involved actions, timelines, and stakeholders. In the implementation, following the division between national and regional levels, the focus shifts to the dimension of *achieved results*. In the case of the State, this corresponds to the distribution of vaccines, while for the Regions this concerns the identification of priority targets, based on economic or health choices. This sequential procedure allowed us to carry out the analysis of the digital scenario, having already clarified which aspects of the communication of the political actors needed to be focused. The article is therefore articulated to describe the role of social media during the pandemic to understand how they were used to operate in the governance of the pandemic, and this as premise before to describe the methodological structure of the study. This is followed by a detailed analysis of the three spheres of regulation, implementation, and communication. The conclusion will show the policy convergences and communication divergences as a basically structure for a permanent engagement and empathy process among citizens and policy makers.

Role of social media during the pandemic

While the investigation of the regulatory and implementation sphere leads us quickly to understand the level of planning concerning the vaccination campaign (regulatory sphere) and the results achieved (implementation sphere), it is not so easy to understand the role of communication through social media has had. In order to clarify the importance of this sphere, it is essential to recall that the role of social media during the pandemic was more prominent than ever before (Wiederhold, 2020; Naeem, 2020; Hussain, 2020). In addition to ensuring the continuity of social relations between individuals, social platforms were also central to the educational sector, the labour

market, and, in general, the institutional and political world (Cuello-Garcia, 2020). Through social media, citizens obtained real-time information about the pandemic and the measures taken to counter it (Fan et al., 2021; Wang et al., 2021; Chan et al., 2020; Bao et al., 2020). Furthermore, profit and non-profit enterprises (De Falco & Romeo, 2021) were able to reorganise their work processes and organisation, and social scientists were able to investigate citizens' attitudes and perceptions related to the emergency (Chandrasekaran et al., 2020; Abd-Alrazaq et al., 2020; Lwin et al., 2020; De Falco et al., 2020). This relevant role of social media should not surprise us. The importance of social media as a central infrastructure in multiple processes has long since been recognised. Concerning political and institutional processes, the concept of Government 2.0 (Bonson et al., 2012; Anttiroiko, 2010) was coined to describe how the Web is changing governance. In addition to using social media analytics to make policy decisions, institutions can use it to promote transparency (Vickers, 2017), citizen participation (Harrison et al., 2012), and collaboration (Chun et al., 2010) which are the core principles of open government. These principles foster citizen engagement (Bonson et al., 2012; Bertot, 2010), government-citizenship interactions and the level of trust of citizens in institutions. Thanks to social media, there can be an improvement in governance processes through the more direct involvement of the various local government bodies, ministries, and authorities and greater citizen participation. When used appropriately, social media can be instrumental in day-to-day political management or policy implementation and in times of crisis and emergency to govern the risk and its material and immaterial consequences. An example could be social media monitoring for emergency management and field operations (Velev & Zlateva, 2012). However, they can also be used for so-called risk communication to citizens. When we talk about risk communication, we usually refer to a communication intended to supply audience members with the information they need to inform their independent judgements about risks to health, safety, and the environment¹.

This type of communication is hugely relevant because, as Barry (2009, p. 212) said about vaccine use during pandemics, «the single most important weapon against the disease will be a vaccine. The next important weapon will be communication». *Risk communication* is a vast field that includes multiple models and theories (Zipkin et al., 2018; Salman et al., 2018; Miller et al., 2017). What matters here are the possible outputs of risk communication, i.e., the increased engagement of citizens that improves their response in times of health crisis (Cernicova-Buca & Palea, 2021). In 2020, the World Health Organisation compiled a checklist for risk communication and com-

¹ <https://www.epa.gov/risk-communication/learn-about-risk-communication>

munity engagement (RCCE)² readiness and initial responses to the Covid-19 outbreak. The checklist is a comprehensive but straightforward guide and contains two points worthy of attention compared to what we have seen so far. The first point concerns internal and partner coordination, and the second refers to community engagement through social media. The second point is relevant given to understanding how social media can influence governance processes. The first point could refer to the Italian context due to many clashes between political actors at a national and regional level, with a central role during all phases of the pandemic.

Since engagement is a central aspect of emergency management, it is interesting to analyze the level of engagement raised by these institutional and political figures on social media during the pandemic and especially during the vaccination phase. This conception will lead to the development of an important research question that will be addressed in the discussion of the sphere of communication analysis, which concerns the level of engagement generated by regional and national actors and the differences between them. Communication is also a complex phenomenon in which content plays a significant role. Therefore it will be necessary first to explore the relevant topics on which regional and national actors focused, then investigate the relationship between topics and engagement. The social media we identified to answer our questions will be Facebook since it is where Italian politicians have a more significant number of followers (We are social, 2021). The results will help understand citizen engagement through social media during the pandemic.

Methodological Framework. A parallel convergent or triangular mixed methods design to analyse regulatory, implementation and social data on national and regional levels

The design underpinning the study presented in the following pages is based on what Teddlie and Tashakkori (2006) have named convergent parallel or triangular mixed methods design. In this design, different methods are used at the same time and given equal dignity (one does not come before the other nor does not have priority over the other) in a functional way to answer related research questions connected to an umbrella question that includes them all.

In our case, it will be a matter of answering the question: which mechanisms of convergence and divergence can be registered in the State-Regions governance of the Covid-19 vaccination campaign? This will lead to

² <https://apps.who.int/iris/bitstream/handle/10665/331513/WHO-2019-nCoV-RCCE-2020.2-eng.pdf>.

the development of three different sub-questions to which a specific analysis step will be corresponded. The first question concerns the study of the *planning* of the vaccination campaign with an analysis of the *regulatory level* (with the reconstruction of timelines and qualitative reconnaissance of the contents of the regulations about categories and vaccinations guidelines). The second question focuses on the study of the *implementation strategies* of the vaccination campaign through the analysis of the *vaccination allocation choices* by target and differential periods (analysing at a quantitative level the data disseminated on the allocation and continuation of the vaccination campaign). The third question will focus on the effects of the public and institutional communication through social media of the national and regional actors involved in the governance of the vaccine campaign. This both at the regulatory level and at the level of implementation choices, in order to analyse contents and engagement strategies for citizens and their direct involvement in the strategic and planning sharing of the vaccination campaign (with combined strategies of automated and quantitative analysis of the content and affordances characterizing social data, such as likes, sharing, engagement).

For a methodological overview of the three spheres (table 1), which can be defined as governance dimensions, different data were collected for the two implicated levels of governance. For the regulatory area at a national level the National Plan or regulatory frameworks were considered to indicate categories and vaccines guidelines. Instead, at a regional level the Regional Plans or regulatory frameworks indicating categories, timeline and vaccines decision were considered. For the implementation dimension, at a national level there were considered data coming from the National Institute of Health (ISS) about vaccine's allocation and type. At a regional level data were considered on vaccinees profile also by vax type for region. For the social communication dimension data were considered at a national level as the Facebook posts coming from the official page of the President of Council, Health Minister, Italian Drug Agency, and National Institute of Health. At a regional level, posts were retrieved from the official page of five Regions. The last section of the table (Divergences/Convergences) identifies the outputs of the analysis, that is, the elements on which the divergence or convergence of each governance dimension is read.

Three different analysis steps are thus initiated, one for each of the spheres involved. The analysis for each of these areas is done separately by combining qualitative and quantitative methods to analyse the different collected data sets.

Table 1. Methodological overview on three governance dimensions

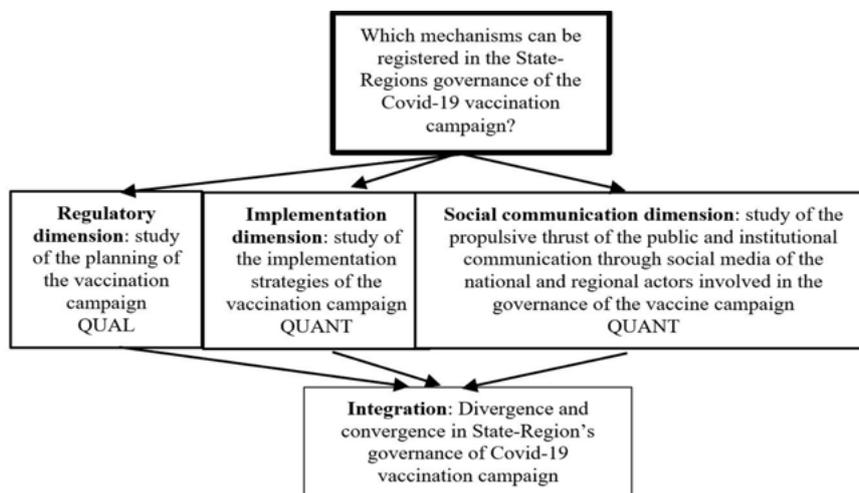
	GOVERNANCE DIMENSIONS		
	REGULATORY	IMPLEMENTATION	INSTITUTIONAL COMMUNICATION
NATIONAL	- National Plan (categories and vaccines guidelines)	- Vaccine's allocation - Type of vaccines allocation	Fb posts from official page of: Presidente del Consiglio (President of the Council); Ministro della Salute (Health Minister); Aifa (Italian Drug Agency); Istituto Superiore di Sanità (National Institute of Health)
REGIONAL	- Regional Plan (categories, timeline and vaccination decisions)	- Vaccinees profile - Vaccinees by vax type	Fb posts from the official page of the Governor of: Lombardy Veneto Lazio Campania Apulia
<i>DIVERGENCE / CONVERGENCE</i>	<i>On norms and guidelines</i>	<i>About distribution (data)</i>	<i>Topics Engagement</i>

Source: our elaboration

The collected data were analyzed to assess issues of divergence and convergence between the two levels of government. These are perceived as differences on rules and guidelines at the regulatory level, vaccine distribution at the implementation level, and finally, relevant issues and commitment to sharing strategies obtained in social communication of vaccine decision making.

Integration is achieved by jointly interpreting the results with the aim of enriching the understanding of the different data sources, corroborating the results obtained by different methods, as well as comparing different levels of analysis within an integrated system such as the State-Regions governance of the Italian vaccination campaign (figure 1).

Figure 1 – Visual model of the named convergent parallel or triangular mixed methods design for the conjoint study of regulatory, implementation and social communication spheres in State-Region's governance of vaccination campaign in Italy



Institutional governance within the regulatory scenario. A common line

The vaccination campaign was characterized by a very broad regulatory scenario. Involving the entire population, its management is in fact very complicated. This required impressive coordination between multiple levels of governance. The most important levels of governance were three: the European level has produced the regulatory plans necessary for the distribution of vaccines. The national level has incorporated the EU plan by preparing the regulatory guidelines and the management of the vaccine needs of the Regions. Finally, the regional level was responsible for the concrete implementation of the campaign, preparing the targets and contributing to the coordination of local units. The literature notes the complexities arising from multi-level governance, especially those involving supranational, national, and local entities. As documented by much research, one of the difficulties of these multi-level systems is ensuring the proper declination of rules and policies across all involved levels (Kazepov, 2010). For example, in the case of the vaccination campaign, national regulations have given way to specific regional declinations, which have considered the health, social, and demographic conditions of the respective territories, as well as the political nuances of the administrations (Atwell et al. 2021).

Starting with the national regulatory scenario of the campaign is an indispensable step in reconstructing regional vaccination policies. The vaccination campaign in Italy started on December 2, 2020, with the presentation of the national vaccination plan developed by several institutional actors: the Ministry of Health, the Extraordinary Commissioner for the emergency, AIFA (the Italian Drug Agency) and Agenas (National Agency for Regional Health Services). The Plan describes the needs and allocations of the 1.3 billion vaccines for each European country, based on their respective populations. There are two major regulatory moments in the campaign. The first is the January 2, 2021, Decree “Elements of Vaccine Strategy Preparation” while the second is the March 12, 2021, Decree “Interim Recommendations on SARS-CoV-2/COVID-19 Vaccination Target Groups” (updated with the April 9, 21 Order 6/2021).

The first decree divided the timing of the vaccination campaign into 4 phases, and each phase identified targets, the level of supply, and the status of vaccine hubs (table 2). In time 1 characterized by a low supply of vaccines and still limited hubs, there were four categories of priority: health and social care workers; residents and staff of assisted living residences; and the elderly over 80. In time 2, following increased supplies and hub uniformity, the target were people over 60, frail people, at-risk socio-demographic groups, and teachers and school staff.

Table 2. Target (white color), supply (light gray) and organization of vaccinational hubs (dark gray) by timeline T

T1	T2	T3	T4
Public and private health and social care workers	Over 60	Teachers and remaining school staff	All people
Residents and RSA staff	Frail people	Essential Services Workers	
Elderly people over 80	Socio-demographic groups at risk	Prisons and community places	
	High-priority teachers and school employees.	People with comorbidities of all ages	
Limited supply	Supply increase	Vaccine supply increasing and vaccine sites at capacity	Vaccine supply and vaccine sites at capacity
Stringent priorities for administration	Uniform organization of vaccinal sites		

Source: our elaboration on Legislative Decree of January 2, 2021

In time 3 with increased supplies and vaccine sites at steady state, the targets become remaining school staff, essential services workers, prisoners, and all physically vulnerable people. At time 4 with supplies at capacity, the campaign is expanded to the entire population. An important innovation is the online platform-based information system that records the distribution of vaccines and supporting materials in real time. In this information process, the role of the Regions is very important, acting as intermediaries for the booking and transmission of data to the central level.

With the Decree n.8 March 12, "Interim recommendations on the target groups of vaccination against SARS-CoV-2/COVID-19", and the Ordinance n. 6/202, the categories to be vaccinated in priority have been updated, giving priority to fragile people and older age groups:

1. persons with high fragility (extremely vulnerable; severely disabled. persons >80 years of age) and cohabiting family members/caregivers;
2. persons between the ages of 70 and 79;
3. persons between the ages of 60 and 69;
4. persons with comorbidities aged <60;
5. persons of the population aged <60 years.

The Regions have been given a crucial role in relation to the timing of the age groups to be vaccinated, the type of vaccine and the setting of vaccination hubs. Regarding the first one, however, there are not great differences between Regions, since in general vaccinations for health and social care personnel, guests and staff of RSAs are started in January 2021. Those for the elderly, the frail and protected groups (teachers and school staff) in February 2021. Vaccinations for adults 40-60 in April 2021. From June 2021, the vaccination campaign is opened to all age groups above 12 years, without any distinction, thanks to the increased availability of vaccines. These phases lead us to think of two macro-divisions, *starting point* and *local implementation*. The first identifies the preliminary phase of the campaign, that is, the one in which the space for regional autonomy is very reduced because it is characterized by a single target (vaccinating health workers). The second, on the other hand, is characterized by potentially more varied regulatory activity. Figure 2 shows a synthetic overview of basic homogeneity about timing and targets as highlighted by the correspondence between the bars. While in the *starting point* phase the correspondence is very high, placing all five Regions in the interval December 2020-beginning of February 2021, the *local implementation* phase presents some differences, although not so pronounced, probably due to different policy orientations. However, the regulatory scenario, as observed, results with few divergences. Moreover, on the whole, a regulatory roadmap has been followed that has respected the priority targets highlighted at the national level. Has this basic homogeneity

been replicated in the implementation phase, that consists in the moment of distribution and allocation of the vaccines?

Figure 2. Target to be vaccinated by Regions.

	December	January	February	March	Avril	May	June
Campania	HEALTH WORKERS		PROTECTED CATEGORIES		ADULTS (40-60)		YOUNG P.
Lazio							
Lombardy							
Apulia							
Veneto							
	STARTING POINT		LOCAL IMPLEMENTATION				

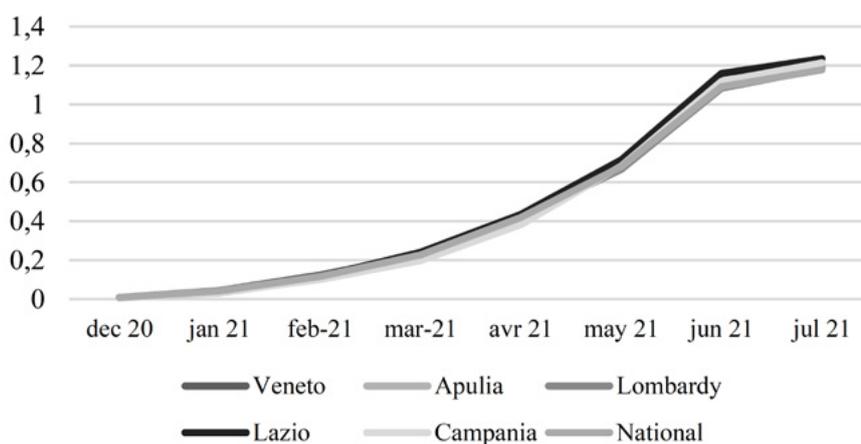
Source: our elaboration on regulatory plans of Regions.

The implementation phase. Marginal differences in allocation and profile of vaccines

We have defined the implementation phase as the activities of allocating vaccines and in the chosen of vaccinees categories. In the first case, this is a highly centralized process, since policy making on allocation criteria was a responsibility of the central level. In the second case, this management was a responsibility of the Regions. In fact, it is up to the Regions to establish the priority among demographic or socio-economic groups and, therefore, the management of vaccination.

Observing the distribution of vaccines in the period December-July 2021 (figure 3), the trend is quite similar for the Regions. On the vaccinable population (over 12 years old), the trend goes from about 0.2% in March, to about 1.2% in July, without significant differences between Regions and the national average. In the context of the political debate that has been very focused on supposed disparities in vaccine distribution (Anro & Boggero, 2021), the data do not appear to show significant variations. In fact, the allocation followed a constant trend that peaked – for all observed Regions – between June and July 2021, which are the last months considered.

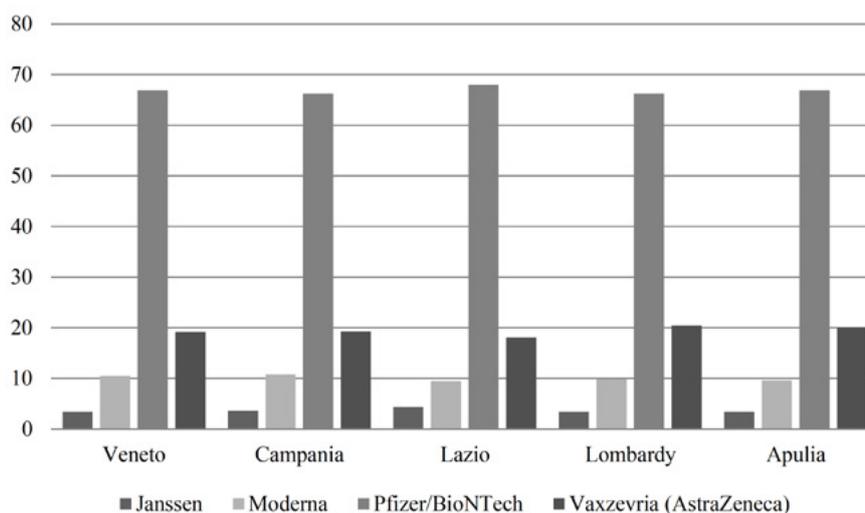
Figure 3. Vaccine allocation by Regions (% on people over 12).



Source: our elaboration on ISS data 2021.

If the distribution considering the type of vaccine (*Janssen*, *Moderna*, *Pfizer*, *Vaxzevria*) – another issue that has kept up the political debate (Semeraro et al., 2021) – this situation of State-Region’s homogeneity does not change much. Figure 4 illustrates a scenario in which, for all the Regions considered, the *Pfizer* vaccine prevails (just under 70%), followed by *Vaxzevria* (about 20%). This is followed by *Moderna* (only Campania exceeds 10% of administration) and *Janssen* (less than 5% in all Regions).

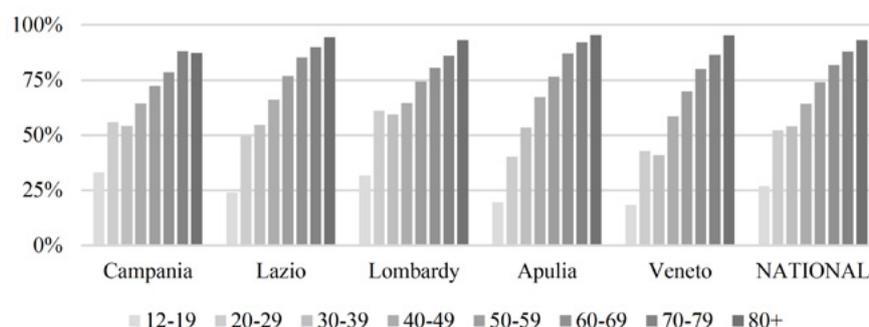
Figure 4. Vaccine allocation by pharma company, by Regions.



Source: our elaboration on ISS data 2021.

As far as the regional plan is concerned, and so the implementation framework of the campaign, the indicators we have considered relate to the actual vaccinations. In fact, the Regions oversee how the vaccinations are organized and, above all, are responsible for defining the priority categories and the type of associated vaccine. Figure 5 shows the distribution of those vaccinated by age. Also, in this case the trend is quite similar. For several reasons due to their greater vulnerability to the virus, the over 80s are the most vaccinated group in all Regions. The biggest difference concerns younger groups, which were the main target in Lombardy and Campania. It is no coincidence that in these two Regions the restarting of schooling and higher education in attendance was, in fact, a very important issue (AGENAS, 2021).

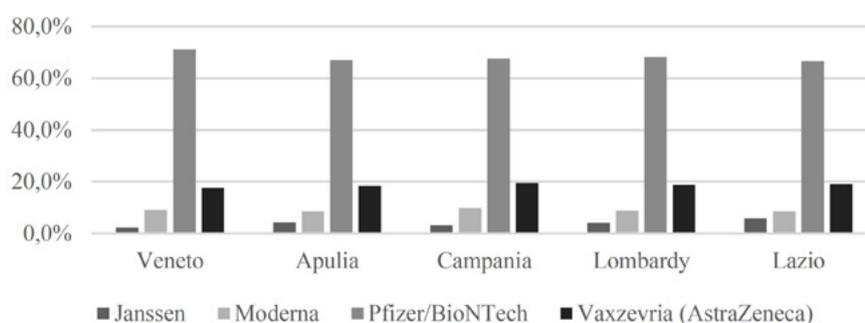
Figure 5 - % of vaccinated by age (the data were normalised with respect to the incidence of the different age groups on the total population).



Source: our elaboration on ISS data 2021.

As previously noted, the allocation by vaccine type was very similar across Regions. It is interesting, then, to check whether there are differences among the vaccinated with respect to the type of vaccine administered. The rate of those vaccinated shown in Figure 6 follows the same trend as the national allocation. Therefore, all Regions administered *Pfizer* for more than 60% of those vaccinated, *Vaxzevria* for about 20%, *Moderna* around 10%, and *Janssen* for about 5%. The media have contributed much to sparking debate around the supposed greater safety attributed to one type of vaccine over another (Semeraro et al., 2021). This has created very heated dialectical contrasts between the Regions, but which evidently have had little significant effect on the allocation and distribution level, as can be seen from the following data.

Figure 6 - % of vaccinated by type of vaccine.



Source: our elaboration on ISS data 2021

The situation observed thus far highlights four areas, all of which converge. At the national level, implementation is observed from the point of view of allocation, both in terms of the quotas of vaccine distributed and the type of vaccine allocated. At the regional level, on the other hand, implementation is described as a function of the vaccinations that have taken place and the profile of the vaccinated by age and vaccine received. Given the strong balance that has emerged in the regulatory and implementation scenario between the central and regional level, it is useful to ask: will the social communication production of the institutional actors of the vaccination campaign be consistent with the situation found (convergence also on the communication issues) or, responding to different logics, will it emerge in a divergent manner?

The social communication dimension. Between Governance and Engagement

According to Hellstrom (2008), governance can be strengthened through ICTs as they improve openness, transparency, dissemination of information between institutions and civil society and the involvement of this latter category. Social media can be strategically used to promote interactions between citizens and government (Writz et al., 2018). Involvement during the vaccine administration phase could undoubtedly have been an added value. Recent studies show how communication between institutions and civil society is essential to improve citizens' response in times of health crisis (Cernicova-Buca & Palea, 2021) and stem the rampant phenomenon of fake news. The indicators chosen for the analysis of the social communication around the vaccination campaign in the Italian case are three: the first is represented by the *reactions* intended as a proxy of the average impact of posts on the topic; the second is the *number of comments* that represent the interaction between

users and institutions; the latter is the *number of shares* that concerns the extent of information propagation.

The first focus concerns the comparison among the macro category, national and regional. The first evidence concerns the differentiation in the percentage of reactions and shares; regarding these two indicators, the posts of national actors have a higher engagement than the regional ones. The percentage of followers “reacting” to the former posts is, on average, three times higher than that of the latter, while for the “share”, the value is seven times higher. It is interesting to note that the ranking between national and regional actors changes if we move from the *average impact of the individual post* expressed in percentage values to the *aggregate impact* expressed in absolute values. The aggregate impact of the regional actors is, in fact, higher because, in quantitative terms, they have expressed themselves more on the topic; in the period considered, the average number of posts published by regional actors is 160, a number three times higher than that of national actors who have an average of about 53. Assuming that the followers reacting to the posts are not always the same, it is possible to state that the greater production of regional actors generated a higher involvement of users than the national ones, thus presenting a higher average aggregate number of reactions, shares, and comments. In operational terms, this interesting difference tells us that considering the percentage values seen above, a greater effort in terms of content production by national actors could have generated more overall engagement with the vaccine issue and pandemic management.

Table 3. Social communication parameters by national and regional actors.

	<i>National</i>	<i>Regional</i>
<i>% Reaction</i>	1.21	0.44
<i>% Share</i>	0.36	0.05
<i>Share x Post</i>	551.13	303.02
<i>Comments x Post</i>	1373.82	1042.98
<i>N. Post</i>	211	801
<i>Tot. Likes</i>	1229764	1672617
<i>Tot. Share</i>	116289	243020
<i>Tot. Comments</i>	289877	836468
<i>Mean N. Post</i>	52.75	160.20
<i>Mean N. Likes</i>	343437.75	375222
<i>Mean N. Comments</i>	29072.25	48604
<i>Mean N. Share</i>	72469.25	167293.60

Source: FanPage Karma, period 20 December – 30 June.

On the other hand, despite their disadvantage in terms of followers reached by their posts, regional actors generated more engagement overall due to the amount of content posted. This analysis of absolute frequencies tells us that the pandemic-related posts reached a significant proportion of people. However, compared to the potential audience, these values should have been higher. As we can see in row 1 of table 3, only 1,21% of subscribers are engaged on average by post. The number of reactions does not necessarily represent the number of people reached by a post but does indicate its interest. On pandemic topics, the reactions should have been more significant.

Table 4. Social media parameters of institutional communication by actor.

	Aifa	Conte	Istituto Sup. Sanità	Speranza	Fontana	Zaia	Zingaretti	De Luca	Emiliano
% Reaction	0.66	2.27	0.57	3	1.19	0.25	0.58	0.14	0.98
% Share	0.48	0.15	0.35	0.33	0.14	0.03	0.05	0.02	0.16
Shares X Post	343.67	6662.40	33.18	734.88	336.64	359.67	176.15	311.75	451.18
Comments X Post	174.07	19328.5	21.08	1849.52	758.62	1074.59	305.52	1385.78	1623.7
N. Post	30	10	123	48	114	125	162	357	44
N. Reaction	14084	1027080	7922	324665	326755	328302	338800	756599	125654
N. Share	10310	66624	4081	35274	38377	44959	28536	111296	19852
N. Comments	5222	193285	2593	88777	86483	134324	49495	494723	71443

Source: FanPage Karma, period 20 December – 30 June.

Shifting the focus to the individual actors (table 4) emerges that two national actors such as Conte (President of the Council) and Speranza (Health Minister), reached the highest percentage of followers for a single post, but if we look at the shares, Aifa (The Italian Drug Agency) and the Istituto Superiore della Sanità (The National Institute of Health) are the actors with the highest percentage. Fontana and Emiliano, respectively, the Governor of the Lombardy Region and the Apulia Region, have the highest reaction percentage among the regional actors, while De Luca, the Governor of the Campania Region, has the lowest. This latter, De Luca, stimulates the debate, and this can be seen from the average number of comments for each post

which is among the highest. It is no coincidence that De Luca has often been in the middle of the public debate because of his particular positions on the management of the Pandemic and the vaccination campaign. De Luca's specificity also emerges in the overall content production on Facebook. He published 357 posts on the subject during the data collection period, doubling Zingaretti (162), the Governor of the Lazio Region, who was the second most prolific actor. Conte, the President of the Council, was the actor who published the least on the subject with only ten posts, but, maybe for his institutional position, he was the actor with the most reaction in absolute value.

Finally, the absolute values tell us that De Luca has created the highest impact in terms of comments and shares, while Conte has the highest number of reactions. Since the differences between the regional actors are not related to the south-north divide (Lombardy and Veneto Region belong to the North of Italy, Lazio is in the Center of Italy, while Campania and Apulia in the South) or regional Covid impact (the most affected Regions were in the North of Italy during the analyzed period), it is possible to hypothesize that they are related to actors' communication style and content. This factor could also explain the differences between the national actors. Therefore, it is necessary to understand what kind of content national and regional actors shared and how it impacted engagement levels.

The analysis of Facebook posts. From centralized handling to differentiated communication.

In order to further clarify the database on which the analysis of the posted contents was based, it can be said that the analysis of social communication on the vaccination campaign³ concerned a dataset of 1.035 Facebook posts of the pages of the main national actors (AIFA - Italian Drugs Agency, ISS - National Institute of Health, Prime Minister Giuseppe Conte, Health Minister Roberto Speranza) and of the pages of regional governors (Vincenzo De Luca for the Campania Region, Michele Emiliano for the Apulia Region, Attilio Fontana for Lombardy Region, Luca Zaia for Veneto Region, Nicola

³ The data was extracted through the digital native application *FanPage Karma* that in addition to the common variables such as date, post text, and URL, also returned us a group of information regarding the interactions and engagement of the post. The extraction keys are related to the semantics about the vaccination campaign, i.e. "#vaccin", "#vaccination", "#somministrazione", "#campaign". The extraction period is in the range December 20 - June 30, i.e., a few days before the start of the campaign until full deployment. We assumed that most of the social discussion about the campaign was concentrated in this period. Data analysis was conducted using TLab Plus 2021 software for the following functions: Vocabulary construction, Textual frequency analysis, Elementary context analysis using unsupervised clustering - bisecting k-means.

Zingaretti for Lazio Region). Following and summarising what was said in the previous paragraph (table 5), as far as national actors are concerned, the ISS page has the highest share of posts on the subject (12%), while among regional actors, Vincenzo De Luca's page has the absolute highest percentage (34%). Overall, there was a clear preponderance of posts among the regional players compared to the national ones (79% and 21%). This is probably linked to the greater role of responsibility of the Regions regarding the actual implementation of the vaccination campaign: the Regions therefore tended to prefer to play a leading communicative role.

Table 5 - % of Facebook post on vaccination campaign by national and regional actors.

<i>National</i>	
ISS	12%
Roberto Speranza	5%
AIFA Agenzia Italiana del Farmaco – official page	3%
Giuseppe Conte	1%
<i>Regional</i>	
Vincenzo De Luca	34%
Nicola Zingaretti	17%
Luca Zaia	12%
Attilio Fontana	11%
Michele Emiliano	4%

Following the common text cleaning and pre-processing operations (normalization and stemming), the vocabulary of most used terms inside the spread content on the official page of the followed actors has been created. Observing the distribution of the keywords (with tf weight⁴) two things are not surprising: the first is the relevant difference in occurrences, which is an effect of the different number of documents in the corpus; the second instead is the substantial similarity among the most frequent words (vaccine, covid19, Vaccinate, etc.) that fall within the selected keywords. There are, however, a group of words characteristic for the national and regional dimensions. The first is recognized by terms close to the semantics of the norms and national monitoring of the campaign and emergency (health, prevention, conference_news, cases, monitoring); the second is more declined

⁴ Term frequency (TF) means how often a term occurs in a document. In the context of natural language, terms correspond to words or phrases.

on terms related to the concrete implementation of the campaign (citizens, receive, adherence, carry out, doctor, and so on). The keyword analysis gave us an initial overview of the characteristic contents of the actors considered. However, a deeper insight into the communication enacted was achieved through the analysis of elementary contexts (figure 7).

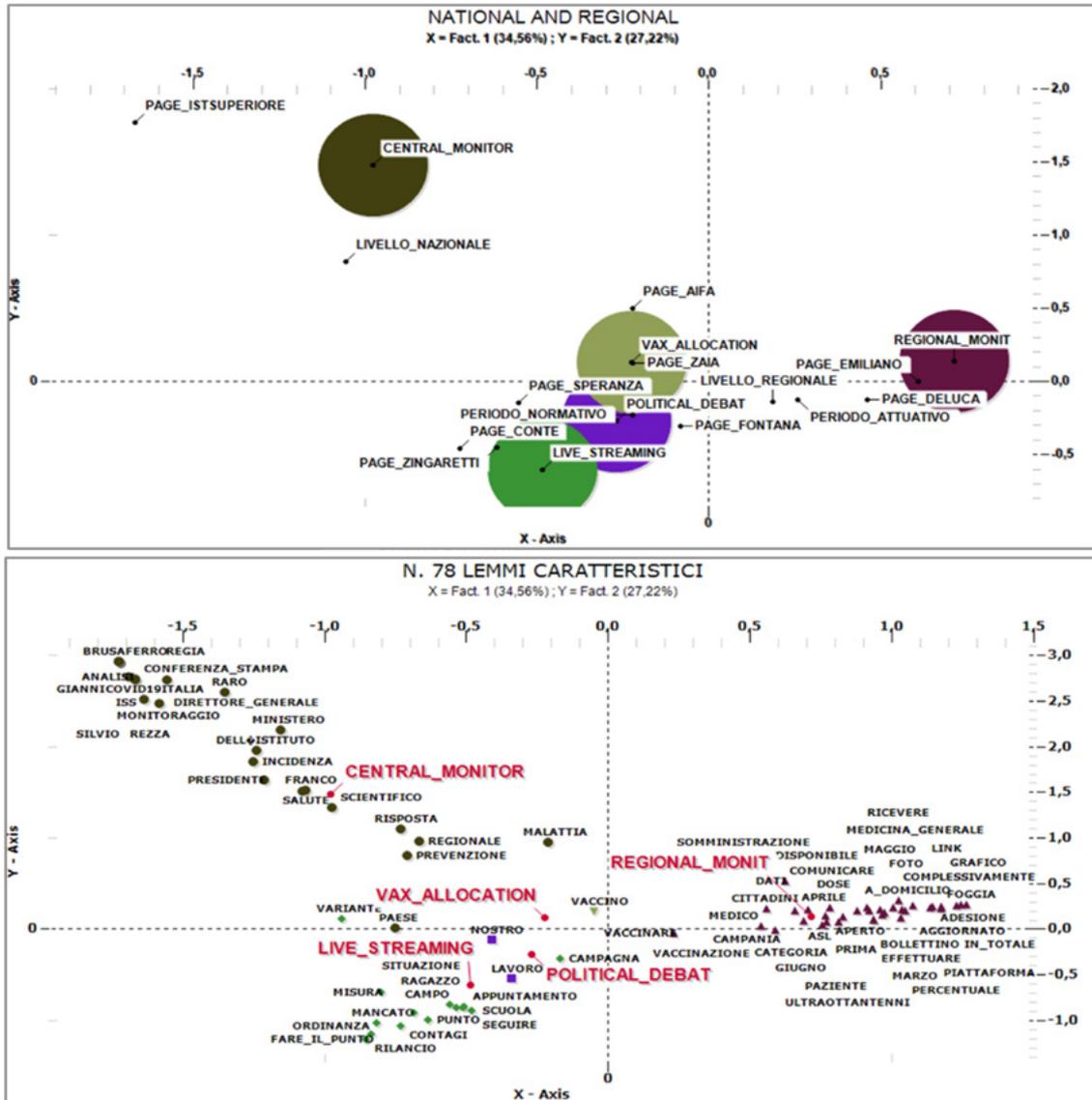
This technique allowed us to perform a non-hierarchical cluster that grouped similar words through the bisecting k-means algorithm (Savaresi & Boley, 2001). This combines k-means clustering with divisive hierarchical clustering. By bisecting k-means. We obtain not only the clusters but also the hierarchical structure of the data point clusters. The 5-cluster partition automatically selected by the software was found to be adequate as it gave good support for content sense interpretation as follow:

1. *central monitoring*: this is the institutional communication related to the monitoring of the vaccination campaign carried out at the central level. There is in fact a strong relationship with the page of the ISS that is responsible for the release of information on vaccination data;
2. *politics debate*: this is the area of politics in the dialectical sense, where the conflict and cooperation are concentrated across the two levels. The conflict is with the central level for the alleged inequalities in the distribution of vaccines (especially Zaia and Fontana) and cooperation occurs instead through a sort of 'pact' between politicians and citizens on the motivation to act, then to vaccinate and be cautious. This last dimension involves mainly national leaders;
3. *livestreaming*: it is recognized by those words that define institutional communication about the campaign. It is a cluster very similar to the previous one. but which finds its specificity in the use of disintermediated communication of political leaders through the native applications of the social platform;
4. *regional monitor*: this is the cluster of information on data-monitoring, predominantly regional, through which data and information about the progress of the pandemic and, above all, the vaccination campaign, are regularly communicated. In this cluster seems to fall much of the institutional communication of the Governor of Campania and Apulia;
5. *vaccine allocation*: it is the area where the allocation of vaccines and especially the type of vaccine is debated. This topic has created a lot of hype, both regarding the alleged inequalities mentioned earlier (in fact there is a strong relationship with Zaia's page, in strong contrast with government decisions), and about the progressive availability of new vaccines (announced by AIFA).

Table 6 – Key words frequency (a.v.) of the first 30 items on national and regional level.

NATIONAL		REGIONAL	
VACCINE	165	VACCINE	742
COVID19	131	VACCINATE	722
VACCINATION	63	VACCINATION	685
OUR	60	COVID19	592
DOSE	57	DOSE	570
HEALTH	55	REGION	308
REGION	52	CAMPAIGN	300
VACCINATE	51	CAMPANIA	283
ISS	50	ADMINISTRATION	277
DATA	45	TODAY	274
CAMPAIGN	44	FIRST	264
CASE	44	OUR	216
BRUSAFERRO	40	CITIZENS	213
LAW	40	DATA	179
COUNTRY	40	RECEIVE	174
PRESIDENT	38	HEALTHCARE	173
WEEK	38	YEARS	150
ITALY	36	ADHESION	145
MINISTRY	34	PERSONNEL	144
NEWS_CONFERENCE	34	PEOPLE	138
AIFA	34	EFFECT	133
HEALTHCARE	33	VENETO	131
THRESHOLD	32	GREAT	122
SILVIO	31	UPDATED	118
PREVENTION	31	SUMMARY	117
ITALIAN	30	MEDICAL	116
YEARS	30	LAZIO	116
MONITORING	29	NEW	113
NEW	27	WORK	107
FIRST	27	CATEGORY	107

Figure 7 – Clustering outputs for National and Regional levels.

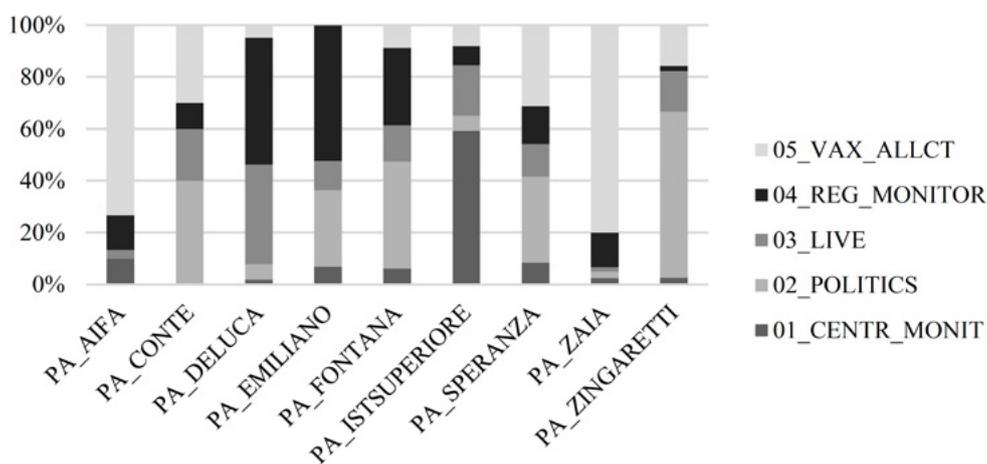


Source: elaboration by T-Lab software via the function of analysis of elementary contexts

A more in-depth look at the individual levels was useful to get some confirmation on previous evidence. Applying the same clustering strategy, we have obtained 5 clusters for the regional level and 3 for the national level. The analysis of the lexicon and of the relationships with the variables seems to split the semantic areas of De Luca and Emiliano for the regional level: the former always declined on the cluster of the regional monitoring of the

campaign and on the institutional communication of data, the latter was instead more oriented to communication on the instructions for the citizen (adhesion, categories and type of vaccine). Similar to the previous one is the cluster on vaccine implementation, but more oriented to highlighting the critical aspects of the campaign implementation system. This cluster is in fact close to the conflict cluster, which is characterized by a group of lemmas in open contrast with the national policy. On the other hand, the 'partnership' cluster, which could be superimposed on the previous 'political_debate' cluster, is of a different nature. In fact, it identifies above all the Zingaretti's pro-government institutional communication articulated according to words oriented towards hope and the invitation to vaccinate.

Figure 8 – Cluster and Fb page.



An in-depth study of the 3 clusters related to the national dimension seems to confirm what has already been highlighted at the general level. Each of the three clusters suggests the high specificity in the content of the institutional communication of national actors. Political leaders are very much oriented towards political debate, the institutional communication of ISS is instead based on the transmission of data monitoring on the campaign and contagion. Finally, the third cluster that identifies institutional communication on vaccine policies (approvals and distribution) is almost exclusively the preserve of the FB page of the AIFA.

Crossing the clusters with the 9 actors confirms what has been said (figure 8). Indeed, profiles emerge that are strongly linked to some clusters, as the ISS page with the monitoring dimension. Moreover, as previously highlighted, the institutional communication attributed to Conte, Speranza, Fontana and Zingaretti is very closed to the general political debate created

around vaccination, both from a ‘cooperative’ point of view and from the ‘conflictual’ State-Regions one.

The relationship between topic and engagement

Having extracted the prevailing themes addressed by national and regional actors, we now try to understand whether these are linked to levels of engagement understood as the summary of the results achieved on the major communication parameters (or affordances) considered in our analysis.

Looking at table 7, it appears that no topic prevails over the others in terms of user engagement. This is because each theme is connected to one of the aspects of engagement. Regarding reactions, the *political theme* is the one that elicits the most (both in absolute values and as a percentage). The lowest percentage of reactions is for posts containing regional updates (*regional monitoring*). The highest number of shares is associated with posts with *central monitoring* and *vaccine allocation*. These results suggest that the most shared themes are general information about the pandemic and vaccine management and allocation. However, the limited number of posts on the *central monitoring* theme determined that the total number of shares is not very high. Finally, concerning comments, most interactions are recorded on posts classified as *regional monitoring*, while the lowest is recorded on *central monitoring* posts.

Table 7 - Social communication parameters by topics

Topic	N. post	% reaction	% share	N. comments	N. share	N. reaction
CENTR_MONIT	104	0.62	0.21	103285	34963	394817
POLITICS	209	0.95	0.11	250426	88603	1181631
LIVE	217	0.53	0.08	298384	87675	810815
REG_MONITOR	272	0.49	0.08	360025	94933	711165
VAX_ALLCT	197	0.56	0.18	189688	74709	634303

Considering these results, it can be hypothesized that while purely political issues mainly lead to reactions (Sorice, 2011), general information tends to be shared, thus transforming the citizen into a node of the information network. Finally, citizens feel the need to confront and express their opin-

ions on the issues that concern their own territory. There is a democratization of the content conveyed by these posts. The progressive increase of reaction to these contents is equivalent to their major engagement power.

Conclusions. Between policy convergences and institutional communication divergences.

We have seen how the national and regional levels have followed a 'common' line for the regulatory and implementation dimensions of the vaccination campaign. What has been planned and implemented at the national level has often been well absorbed by the Regions, which only on a few occasions have outlined different strategies, probably dictated more by logistical and not governmental needs. The institutional communication dimension, on the other hand, has drawn a totally different scenario. Primarily, the greater content production of regional actors generated a higher involvement of users on vaccination campaign, performing better than the national actors. Secondly, the homogeneity of the interventions was contrasted by a 'communicative federalism' characterized by different topics. In some cases, these topics have denoted an open conflict (dialectical) towards the central level, and only in a few cases we found a lexical sharing between the two levels (this is the case of Zingaretti, not by chance very close to the national government). One of the reasons for this divergence that emerged could be that the regulatory and implementation level responds to different logics with respect to the institutional communication level, which is more focused on creating engagement and, therefore, political consensus. As we will see following, engagement is certainly an aspect to be considered in the analysis of vaccine institutional communication as for the Governors of the Regions, social consensus in the sharing of vaccination strategies may in a way be equivalent to a political consensus sharing functional to the retention of the regional governmental leadership of these political actors. The role of institutional communication in the governance of the vaccine campaign could not be seen as marginal at all.

The government of the emergency could become a pure strategy of consensus. If this is extremely clear with what is happening at the regional level, similar processes could also invest the national dimension (for example, the former prime minister, Conte, could enjoy good trust for the management of the emergency even after the lapse of his institutional position). In the wake of such an equivalence between the position of prominence in institutional communication during the emergency and the management of such a delicate moment as the vaccination campaign, the trend whereby regional actors are more engaged in the production of social content in favour of the search for greater political consensus will not decline in subsequent phases.

This differentiates the contents and rhetoric of the actors involved in vaccine communication, which, on the one hand, deploys contents of a political nature more closely related to the allocation and implementation choices of the vaccination campaign, while, on the other hand, sees a more informative-educational institutional communication prerogative of the national actors.

This articulation underlines the fact that institutional communication is not free from political influences and that in moments of extreme urgency and in which totally unexpected situations are faced, it generates very peculiar interplay and scenarios.

It should be also emphasized that, in spite of what happens with actors, no one topic prevails over the others in terms of user engagement. This is because each topic is related to one of the features of the engagement.

Therefore, in order to provide an answer to the general question underlying the interest of this study, namely “Which mechanisms can be registered in the State-Regions governance of the Covid-19 vaccination campaign?”, it can finally be said that the mechanisms of regulatory convergence between the national and regional levels worked as a glue and harmoniser of the allocative and implementation choices of the vaccination campaign. However, it is only by looking at the communication component that it is possible to understand a highly destabilising scenario such as the Italian one in which the Governors of the different Regions have carried out different narrative rhetoric on the vaccination strategy. Some of them to the advantage of rational and more informed arguments, others to the advantage of recriminatory rhetoric and in open conflict with the national level of decidedly political matrix. This dynamic justifies what then has been the general perception of citizens disoriented by public debates in which, among other things, the strategic operation of regulatory and implementation dynamics has not found equal space to those devoted to political rhetoric.

Without this in-depth study of the three spheres analysed from a mixed methods perspective, any attempt to identify the scenario and develop the first Covid-19 vaccination campaign would therefore be incomplete. Even if, the effort of the analyses carried out can be used as a substantial advancement in the debate on the search for functional models to study phenomena which are complex in terms of the levels, actors, and dynamics involved, such as the one at the middle of the presented study.

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References

- Abd-Alrazaq, A., Alhuwail, D., Househ, M., Hamdi, M., & Shah, Z. (2020). Top concerns of tweeters during the COVID-19 pandemic: infoveillance study. *Journal of medical Internet research*, 22(4), e19016. doi:10.2196/19016.
- Agenas (2021). Monitoraggio Piano Vaccinazioni Anti-Covid 19. Retrieved from https://www.agenas.gov.it/covid19/web/file/Report_Monitoraggio_Vaccini.pdf.
- Amaturo, E., & Punziano, G. (2016). *I Mixed Methods nella ricerca sociale*. Roma: Carocci.
- Anro, I.A., & Boggero, G. (2021). La strategia di vaccinazione anti COVID-19 nell’Unione europea: Profili istituzionali e riflessi sulla libertà di circolazione. *Eurojus*, 1 (Special), 1-49.
- Anttiroiko, A.V. (2010). Innovation in democratic e-governance: Benefitting from Web 2.0 applications in the public sector. *International Journal of Electronic Government Research (IJEGR)*, 6(2), 18-36. doi:10.4018/978-1-61520-931-6.ch007.
- Attwell, K., Harper, T., Rizzi, M., Taylor, J., Casigliani, V., Quattrone, F., & Lopalco, P. (2021). Inaction, under-reaction action and incapacity: communication breakdown in Italy’s vaccination governance. *Policy Sciences*, 54(3), 457-475. doi: 10.1007/s11077-021-09427-1.
- Bao, H., Cao, B., Xiong, Y., & Tang, W. (2020). Digital media’s role in the COVID-19 pandemic. *JMIR mHealth and uHealth*, 8(9), e20156. DOI: 10.2196/20156.
- Barry, J. M. (2009). Pandemics: avoiding the mistakes of 1918. *Nature*, 459(7245), 324-325. doi: 10.1038/459324a.
- Behnke, N., Broschek, J., & Sonnicksen, J. (2019). Introduction: the relevance of studying multilevel governance. In N. Behnke, J. Broschek & J. Sonnicksen J. (Eds.), *Configurations, dynamics and mechanisms of multilevel governance* (pp. 1-19). Cham: Palgrave Macmillan.
- Bertot, J. C., Jaeger, P. T., & Hansen, D. (2012). The impact of polices on government social media usage: Issues, challenges, and recommendations. *Government information quarterly*, 29(1), 30-40. doi:10.1016/j.giq.2011.04.004.
- Boccia Artieri, G., Greco, F., & La Rocca, G. (2021). The construction of the meanings of #coronavirus on Twitter: An analysis of the initial reactions of the Italian people. *International Review of Sociology*, 31(2), 287-309. doi: 10.1080/03906701.2021.1947950.
- Bonsón, E., Torres, L., Royo, S., & Flores, F. (2012). Local e-government 2.0: Social media and corporate transparency in municipalities. *Government information quarterly*, 29(2), 123-132. doi:10.1016/j.giq.2011.10.001.

- Calise, M. (2011). Personalization of politics. In B. Badie, L. Morlino & D. Berg-Schlosser (Eds.), *International Encyclopedia of Political Science* (pp. 1857–1860). London: Sage.
- Cernicova-Buca, M., & Palea, A. (2021). An appraisal of communication practices demonstrated by romanian district public health authorities at the outbreak of the COVID-19 pandemic. *Sustainability*, 13(5), 2500. doi:10.3390/su13052500.
- Chan, A., Nickson, C. P., Rudolph, J. W., Lee, A., & Joynt, G. M. (2020). Social media for rapid knowledge dissemination: early experience from the COVID-19 pandemic. *Anaesthesia*, 75(12), 1579–1582. doi: 10.1111/anae.15057.
- Chandrasekaran, R., Mehta, V., Valkunde, T., & Moustakas, E. (2020). Topics, trends, and sentiments of tweets about the COVID-19 pandemic: Temporal infoveillance study. *Journal of medical Internet research*, 22(10), e22624. doi: 10.2196/22624.
- Chun, S., Shulman, S., Sandoval, R., & Hovy, E. (2010). Government 2.0: Making connections between citizens, data and government. *Information Polity*, 15(1-2), 1-9. doi: 10.3233/IP-2010-0205.
- Cuello-Garcia, C., Pérez-Gaxiola, G., & van Amelsvoort, L. (2020). Social media can have an impact on how we manage and investigate the COVID-19 pandemic. *Journal of clinical epidemiology*, 127, 198–201. doi: 10.1016/j.jclinepi.2020.06.028.
- De Falco, C. C., & Romeo, E. (2021). Social Sciences Research Methods Regarding COVID-19 Pandemic. A PRISMA Systematic Review. *Culture e Studi del Sociale*, 6(1, Special), 123-141.
- De Falco, C. C., Punziano, G., & Trezza, D. (2021). A mixed content analysis design in the study of the Italian perception of COVID-19 on Twitter. *Athens Journal of Social Sciences*, 8(3), 191-210. doi:10.30958/ajss.8-3-3.
- Di Lisio, M., & Trezza, D. (2021). Digital Methods to Study (and Reduce) the Impact of Disinformation. *Culture e Studi del Sociale*, 6(1, Special), 143-156.
- Dodds, K., Broto, V. C., Detterbeck, K., Jones, M., Mamadouh, V., Ramutsindela, M.,... Woon, C. Y. (2020). The COVID-19 pandemic: territorial, political and governance dimensions of the crisis. *Territory, Politics, Governance*, 8(3), 289-298. doi: 10.1080/21622671.2020.1771022.
- Fan, Z., Yin, W., Zhang, H., Wang, D., Fan, C., Chen, Z., & Guo, H. (2021). COVID-19 Information Dissemination Using the WeChat Communication Index: Retrospective Analysis Study. *Journal of Medical Internet Research*, 23(7), e28563. doi: 10.2196/28563.
- Gamhewage, G. (2017). A systematic review of literature on effectiveness of training in emergency risk communication. *Journal of health communication*, 22(7), 612-629. doi: 10.1080/10810730.2017.1338802.
- Garavaglia, C., Sancino, A., & Trivellato, B. (2021). Italian mayors and the management of COVID-19: adaptive leadership for organizing local governance. *Eurasian Geography and Economics*, 62(1), 76-92. doi: 10.1080/15387216.2020.1845222.
- Guarino, S., Pierri, F., Di Giovanni, M., & Celestini, A. (2021). Information disorders during the COVID-19 infodemic: The case of Italian Facebook. *Online Social Networks and Media*, 22, 100124. doi: 10.1016/j.osnem.2021.100124.
- Harrison, T. M., Guerrero, S., Burke, G. B., Cook, M., Cresswell, A., Helbig, N., Pardo, T. (2012). Open government and e-government: Democratic challenges from a public value perspective. *Information Polity*, 17(2), 83–97. doi: 10.3233/IP-2012-0269.
- Hellstrom, J. (2008). *Mobile phones for good governance– challenges and way forward*. Retrieved from Stockholm University/ website: <http://www.w3.org/2008/10/MW4DWS/papers/hellstromgov.pdf>

- Hussain, W. (2020). Role of social media in COVID-19 pandemic. *The International Journal of Frontier Sciences*, 4(2), 59-60. doi: 10.37978/tijfs.v4i2.144.
- Kazepov, Y. (2010). *Rescaling social policies: towards multilevel governance in Europe* (Vol. 38). Vienna: Ashgate Publishing.
- Lwin, M.O., Lu, J., Sheldenkar, A., Schulz, P.J., Shin, W., Gupta, R., & Yang, Y. (2020). Global sentiments surrounding the COVID-19 pandemic on Twitter: analysis of Twitter trends. *JMIR public health and surveillance*, 6(2), e19447. doi: 10.2196/19447.
- Miller, A. N., Sellnow, T., Neuberger, L., Todd, A., Freihaut, R., Noyes, J.,... Gamhewage, G. (2017). A systematic review of literature on effectiveness of training in emergency risk communication. *Journal of health communication*, 22(7), 612-629. doi: 10.1080/10810730.2017.1338802.
- Naeem, M. (2021). The role of social media to generate social proof as engaged society for stockpiling behaviour of customers during Covid-19 pandemic. *Qualitative Market Research*, 24(3), 281-301. doi:10.1016/j.jretconser.2020.102226.
- Nicola, F., & Scaccia, G. (2021). The Italian Model to Fight COVID-19: Regional Cooperation. Regulatory Inflation. and the Cost of One-Size-Fits-All Lockdown Measures. *Administrative Law Review*, 73(1), 53-75.
- Punziano, G., De Falco, C. C. & Trezza, D. (2021). Tra geografia delle narrazioni e geografia dei contagi in Italia: il contributo dell'analisi spaziale e del contenuto dei tweet alla comprensione della pandemia. *Sociologia e ricerca sociale*, 125, 84-117. doi: 10.3280/SR2021-125005.
- Rega, R., & Bracciale, R. (2018). La self-personalization dei leader politici su Twitter. Tra professionalizzazione e intimizzazione. *The Lab's Quarterly*, XX(2), 61-68.
- Salman, A.M. & Li, Y. (2018). Flood risk assessment. future trend modeling. and risk communication: a review of ongoing research. *Natural Hazards Review*, 19(3), 04018011. doi: 10.3390/w13202806.
- Savaresi, S. M., & Boley, D. L. (2001, April). On the performance of bisecting K-means and PDDP. In *Proceedings of the 2001 SIAM International Conference on Data Mining* (pp. 1-14). Society for Industrial and Applied Mathematics.
- Semeraro, A., Vilella, S., Ruffo, G., & Stella, M. (2022). Writing about COVID-19 vaccines: Emotional profiling unravels how mainstream and alternative press framed AstraZeneca, Pfizer and vaccination campaigns. *ArXiv preprint arXiv:2201.07538*. doi: 10.48550/arXiv.2201.07538.
- Solito, L. (2018). Comunicazione istituzionale e società digitale. Un nuovo ruolo per i comunicatori pubblici. *Comunicazione politica*, 19(3), 393-412. doi:10.3270/91637.
- Sorice, M. (2011). *La comunicazione politica*. Rome: Carocci.
- Teddle, C. & Tashakkori, A. (2006). A general typology of research designs featuring mixed methods. *Research in the Schools*, 13(1), 12-28.
- Velev, D., & Zlateva, P. (2012). Use of social media in natural disaster management. *International Proceedings of Economic Development and Research*, 39, 41-45.
- Vickers, N.J. (2017). Animal communication: when I'm calling you. will you answer too? *Current biology*, 27(14), 713-715. doi: 10.1016/j.cub.2017.05.064.
- Wang, P.W., Lu, W. H., Ko, N. Y., Chen, Y.L., Li, D.J., Chang, Y.P. & Yen, C.F. (2020). COVID-19-related information sources and the relationship with confidence in people coping with COVID-19: Facebook survey study in Taiwan. *Journal of medical Internet research*, 22(6), e20021. doi:10.2196/20021.

- We are social (2021). *Digital 2021*. Retrieved from [www.wearesocial.com: https://wearesocial.com/digital-2021](https://wearesocial.com/digital-2021).
- Wiederhold, B.K. (2020). Using social media to our advantage: alleviating anxiety during a pandemic. *Cyberpsychology, Behavior and Social Networking*, 23(4), 197-198. doi: 10.1089/cyber.2020.29180.bkw.
- Wirtz, B. W., Daiser, P., & Mermann, M. (2018). Social media as a leverage strategy for open government: an exploratory study. *International Journal of Public Administration*, 41(8), 590-603. doi: 10.1080/01900692.2017.1289388.
- Zipkin, D.A. Umscheid, C. A. Keating, N.L., Allen, E., Aung, K., Beyth, R. & Feldstein, D.A. (2014). Evidence-based risk communication: a systematic review. *Annals of internal medicine*, 161(4), 270-280. doi: 10.7326/M14-0295.

