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Original Research

# (Dis)harmony in times of crisis? An analysis of COVID-related strategic communication by Swiss public health institutions

A. Ort [a, *, c], T. Rohrbach [b, c]

[a] University of Lucerne, Faculty of Health Sciences and Medicine, Frohburgstrasse 3, 6002, Lucerne, Switzerland
[b] University of Bern, Institute of Communication and Media Studies, Bern, Switzerland

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ABSTRACT

*Objectives:* This study aims to assess COVID-related communication by Swiss public health institutions (PHI) as well as the challenges they faced in implementing their communication strategies.
*Study design:* This study uses a two-part mixed methods design, combining automated content analysis of press releases by PHI and semi-structured interviews with PHI communication experts.
*Methods:* The automated content analysis uses natural language processing techniques to measure semantic themes and linguistic properties of 1882 press releases from national and regional PHI during the first year of the COVID-19 pandemic. The semi-structured interviews with 25 communication experts from key PHI explore the challenges faced in implementing their communication strategies.
*Results:* The content analysis reveals key themes in press releases, including non-pharmaceutical interventions, quarantine, testing, contact tracing, hospital situations, and the pandemic's impact on the economy. The linguistic measures indicated a decrease in complexity and readability over time, with no significant differences between national and regional PHI. Interviews revealed challenges arising from organizational structures, the multi-systemic nature of the pandemic, and from expectations of the public.
*Conclusions:* The study highlights the importance of agility in public health communication and the need for efficient coordination within and between PHI. Organizational structures should be adapted to allow for more agile modes of operation during crises. Policymakers should clarify roles and responsibilities of different actors in public health frameworks to ensure streamlined communication. Understanding the communication efforts and challenges faced by PHI during the pandemic helps preparing for future health crises and improve public health communication practices.


## Introduction

The COVID-19 pandemic has presented unprecedented challenges for public health institutions (PHI) worldwide. PHIs, including global health organizations, national health departments or ministries, and regional health authorities, were tasked to design, communicate, and implement strategies to tackle complex epidemiological situations. During such times of heightened uncertainty, effective communication by PHI is particularly vital for managing public responses to the pandemic and its pervasive impact on society writ large.[1–3] First, communication from PHI serves as an information source that *directly* orients individuals and communities through the constantly evolving landscape of the pandemic.[4,5] Moreover, research has also shown that PHI *indirectly* reach mass audiences because journalists heavily rely on information by PHI in their coverage of the crisis.[6,7] Second, PHI's strategic communication is key for enforcing population-wide adoption of preventive interventions to contain the spread of the virus, such as hand hygiene, mask-wearing, social distancing, and stay-at-home orders, or vaccination.[8,9] Third, PHI rely on communication to track the public's "social mood"[10] and establish public trust in the healthcare system.[11,12] Fostering a sense of trust and responsibility not only promotes adherence to measures implemented by PHI but also reduces skepticism, which is crucial for combating disinformation and misperceptions.[13–15]

Beyond the COVID-19 pandemic, a key task of scholars and practitioners of public health is to critically evaluate public communication by PHI to prepare for the next global health crisis.[16–18] Part of this evaluation is to assess the content and delivery of communication provided by PHI as a crucial first step in comprehending subsequent processes such as knowledge

* Corresponding author.
*E-mail address:* alexander.ort@unilu.ch (A. Ort).
[c] Both authors are equal contributors to this work and designated as co-first authors.

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acquisition and attitude formation.[19] Extant research has more generally focused on COVID-related discourses on social media[10,19,20] or in mainstream media.[6,7] Institutional perspectives that center on the communicative role of PHI are scarce. For example, a recent and comprehensive review on public health messaging during the COVID-19 pandemic omits the role of PHI altogether despite conceding that they are "critical in the communication process".[2] Consequently, there is currently little understanding of the direct communication of PHI and the challenges they face in communicating in and about the global pandemic.[21]

We tackle this gap by investigating COVID-related communication by PHI in Switzerland by means of a two-part mixed methods design. First, we quantitatively assess and compare the themes and linguistic style of official communication over time and across national and regional PHI. For this first research question, we perform an automated content analysis of all press releases published by regional and national PHI in the German-speaking part of Switzerland during the first year of the pandemic ($N = 1882$). Second, we qualitatively explore PHI's challenges in implementing their communication strategies and whether those challenges vary across regional and national PHI. To answer this second research question, we draw on a series of semi-structured interviews with communication experts of key PHI to understand the challenges of COVID-related communication strategies ($N = 25$).

The Swiss case is especially interesting for the empirical analysis of communication by PHI. In federalist Switzerland, decisions about preventive measures (e.g., lockdowns, mask mandates, closings) were made at the federal level; however, the 26 cantons (i.e., regions) were independently tasked with the implementation of—and communication about—measures and developments.[22] Depending on their specific epidemiological situation, regions could (and did) choose to adopt stricter measures, resulting in regional variation of implemented measures.[23] Moreover, there is reason to believe that Swiss PHI have struggled to meet the public's expectations. A recent survey suggests that 24 percent of the Swiss population was dissatisfied with pandemic-related communication, and another 17 percent even suspect health authorities to have strategically engaged in misinformation.[24] Likewise, an independent evaluation of governmental crisis management concludes that—though satisfying in general—there is a need for more precise coordination of national and regional communication strategies.[25]

## Methods

### *Automated content analysis of press releases*

#### *Sample*

The large-scale automated content analysis includes all published press releases from Swiss national and regional PHI during the first year of the pandemic, spanning the entire year of 2020 ($N = 1882$). The press releases stem from 20 PHIs: the Federal Office of Public Health (national level) and the cantonal health departments from all 19 German-speaking cantons (regional level). We choose these official outlets for pandemic information, as they serve as a central source for media coverage and other public actors in crises.[26] The period covers the start of the pandemic before the first occurrence of confirmed cases in Switzerland (25.02.2020), the declaration of a state of "extraordinary situation" with emergency law by the Swiss government (16.03.2020), a first lockdown (16.03.2020–29.05.2020), a summer with relaxed measures and decreases incidence rates, and the beginning of a second wave towards the end of 2020.[27] An overview of the sample is depicted in Fig. 1 below.

#### *Data processing and analysis*

Data processing and analysis consisted of three steps. First, the raw text in German language was extracted from the press releases and subjected to minimal text processing steps, including changing text to lowercase and standardizing language encoding.

Second, we derived a series of measures from the press release text data. The *source* of the press release was coded based on the metadata as either Federal Office of Public Health (=0) or one of 19 regional Offices of Public Health from the German-speaking part of Switzerland (=1). Following the example of previous studies,[7,28] we used structural topic modeling (STM)[29] to identify the content of press releases as semantic themes by transforming the text into a corpus with word counts and defining model parameters ($k = 60$ topics) with publication date and source as covariates. Topics were manually labeled based on semantic coherence and exclusivity and merged into themes to reduce overlap.

To assess the style of communication in press releases, we computed six commonly used *linguistic measures* using standard natural language processing pipelines.[30] The mean sentence length (1) is a fundamental metric, focusing on the average length of sentences within a text, with shorter sentences often indicating greater readability.[31] The Flesch-Kincaid index (2), a widely recognized readability test, evaluates text complexity based on sentence and word length, generating scores to reflect readability levels, with lower scores signifying more complex texts.[32] For German-language texts, we apply the German version of the Simple Measure of Gobbledygook (SMOG.de) (3), which assesses the years of education required for text comprehension, emphasizing polysyllabic words.[33] Shannon's entropy (4) is another critical measure, derived from information theory, quantifying text unpredictability, with higher entropy suggesting greater complexity.[34]

To evaluate lexical richness, Carroll's corrected type-token ratio (CTTR) (5) is used. This measure provides insights into the diversity of vocabulary within the text, an important aspect of textual complexity and reader engagement.[35] Additionally, we calculate the mean number of trust-evoking words (e.g., solution, advice, accountable, respond, reassure, no need for, responsibility) in each press release based on the German version of the EmoLex (6), which helps in understanding the emotional appeal and persuasiveness of the text.[36] All measures were subsequently standardized through *z*-transformation.

Third, we employ generalized additive models with cubic shrinkage smooth terms for date to model each outcome measure over time.[37] The models incorporate a dummy variable testing for differences in press releases between national vs. regional PHIs. To account for statistical dependence from nested data, we cluster models around the level of individual PHIs. Additional statistical controls include document length, daily rates of confirmed infections and deaths, and the share of city population as a measure of urbanization.

### *Semi-structured interviews*

Between January and July 2021, we recruited a sample of individuals responsible for public institutional communication within key Swiss PHI. All responsible experts for public communication at national and regional PHI received a study description and an invitation, along with up to two reminders, via email. The final sample ($N = 25$, federal level: $N = 4$, cantonal level: $N = 21$) consisted of all interested PHI representatives who agreed to participate after informed consent. Interviews lasted approximately 40 min on average.

The interviews focused on experiences during the first 12 months of the pandemic and were structured with a guide derived from literature on social marketing and public health program

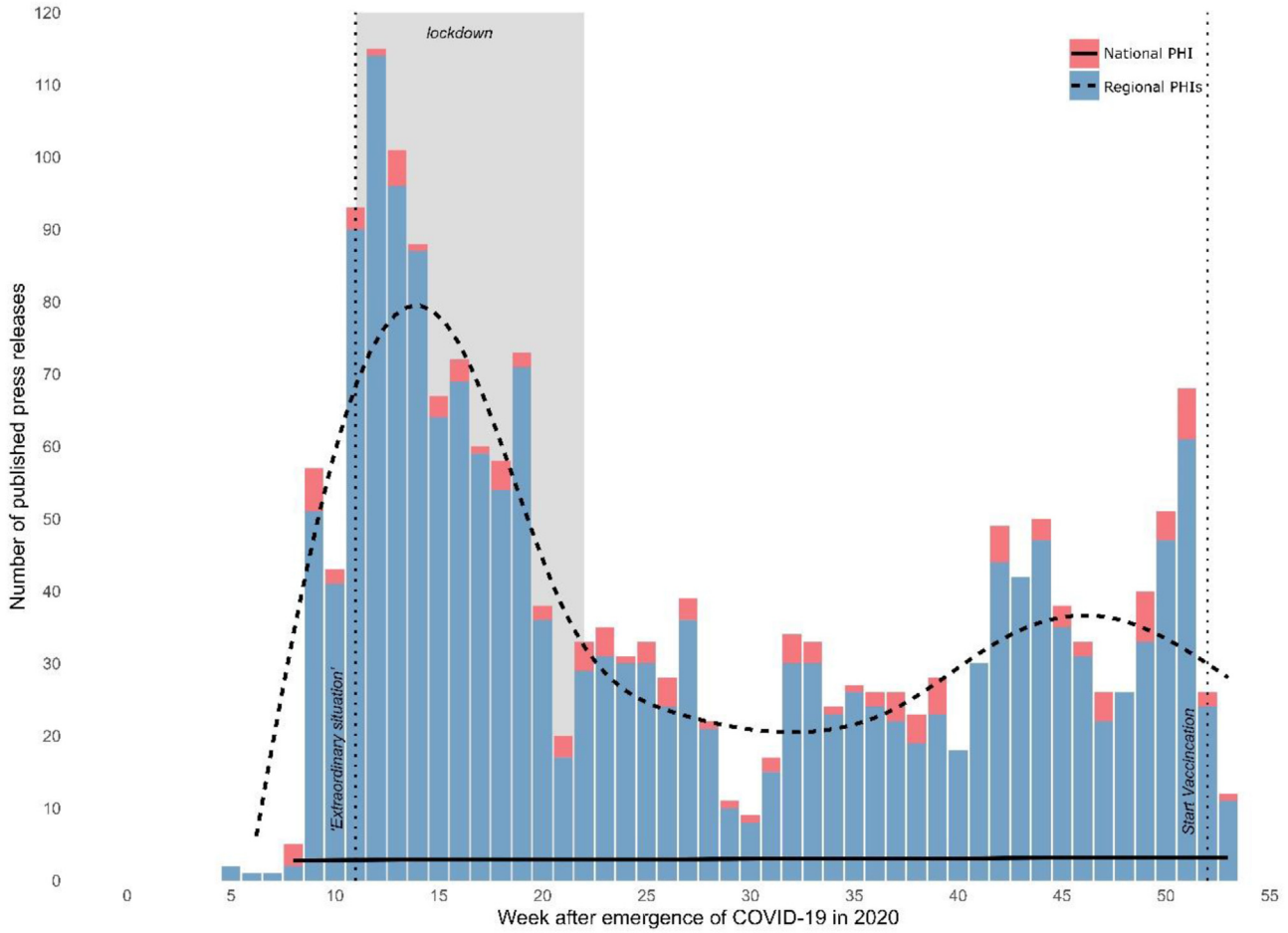


**Fig. 1.** Overview of the number of press releases (y-axis) issued by national (red) and regional (blue) Swiss public health institutions ($N = 1882$) over the course of the first year of the pandemic in 2020 (x-axis). (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

evaluation.[38,39] The guide consisted of questions covering (1) experts' personal experiences, (2) the PHI's overall communication strategy, (3) specific public health message planning, delivery, and evaluation, and (4) key insights gained from the experience. In this article, we focus on the inductive identification of key challenges in implementing strategic communication about the pandemic across these themes. For data analysis, the raw transcripts were first structured by collecting all passages where interviewees mention challenges in their work as communication experts. We then summarized the observations by consolidating individual challenges into non-redundant clusters and grouping them into main categories.[40,41]

## Results

### *Content of communication by public health institutions*

Fig. 2 summarizes the six core themes that emerged from analyzing press releases during the COVID-19 pandemic over time. These themes offer valuable insights in three distinct ways. First, they shed light on the areas of expertise and responsibility held by public health institutions. Alongside topics directly associated with the virus and its transmission (such as nonpharmaceutical interventions [NPIs], quarantine, testing, and contact tracing), press releases also focused on hospital situations and the pandemic's impact on the economy. Second, the longitudinal analyses reveal that NPIs and economic aspects remained important throughout the year. However, information regarding quarantine appeared to be closely linked to epidemiological developments, and communication regarding hospital situations was particularly prominent during the initial wave of the pandemic. The observed U-curve in testing-related communication, with a decrease during summer and an increase towards winter, suggests a responsive approach by public health institutions. This pattern reflects the changing needs and dynamics of the pandemic, with a reduction in cases during summer and a resurgence in winter. The concurrent communication on tracing does not indicate a replacement of testing strategies, but an expansion of tools to manage the evolving situation.

Fig. 3 displays correlations of themes in press releases from national and regional PHIs. The national PHI tends to address multiple aspects of the pandemic in one press release, as shown by the positive correlations between themes. However, testing and tracing strategies are an exception, with a negative correlation indicating their infrequent co-occurrence. Press releases from regional PHIs combine messages about tracing and quarantining, while other themes are only weakly and negatively associated, suggesting a focus on singular aspects of the pandemic rather than addressing multiple issues simultaneously, unlike national PHI. This pattern might also suggest an interdependence where the national PHI communicates the broader strategies in few press releases, which the regional PHIs then implement one by one with concrete measures.

Fig. 4 shows how linguistic features of PHI press releases evolve over time. CTTR decreases, indicating less lexical diversity as the

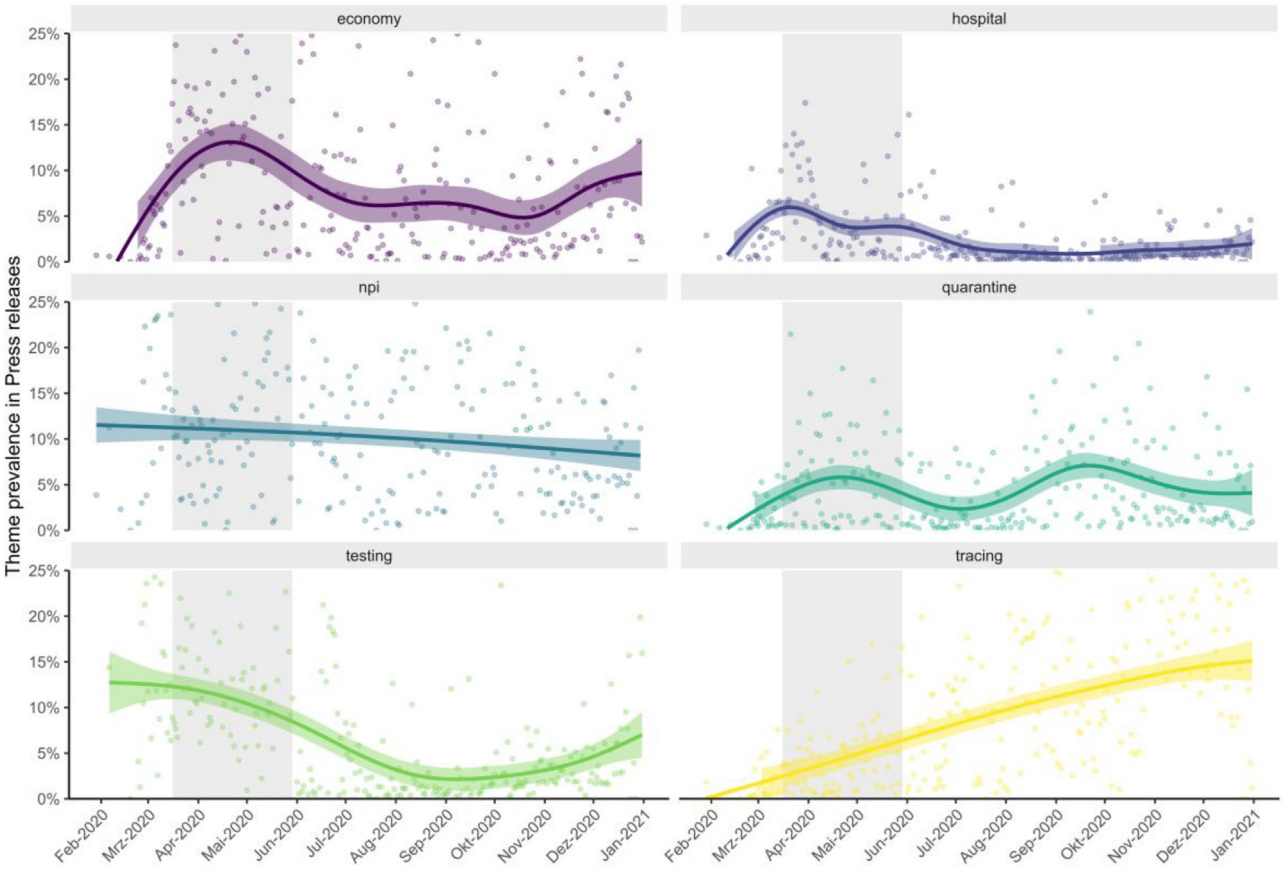


**Fig. 2.** The prevalence of semantic themes (y-axis) in press releases from Swiss public health institutions ($N = 1882$) over the course of the first year of the pandemic in 2020 (x-axis).

pandemic progresses. Similarly, SMOG, Flesch-Kincaid, mean sentence length, and Shannon entropy decrease, reflecting a shift towards more readable language. A smaller peak in readability measures during the lockdown suggests challenges in conveying the nuances of such an unprecedented situation. Trust-evoking language is scarce in the first six months, declining further later. Fig. 5 reveals slight differences in linguistic properties between press releases from national and regional PHI. Regional PHI use slightly more lexically diverse language (CTTR: $b = 0.75$, 95 % $CI = 0.42–1.08$, $P < 0.001$) and more trust-associated words ($b = 0.44$, 95 %$CI = 0.07–0.81$, $P = 0.019$). However, there is little evidence of source effects on readability measures, except for Shannon's entropy ($b = 0.33$, 95 %$CI = 0.03–0.62$, $P = 0.030$).

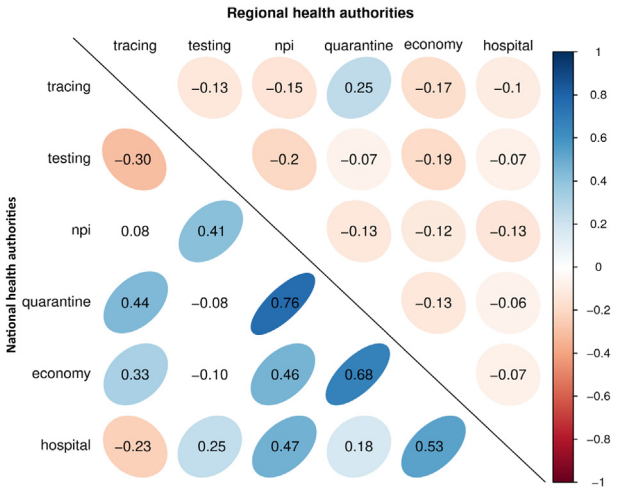


**Fig. 3.** Pairwise correlations between the prevalence of semantic themes in press releases for the national (lower diagonal) and regional (upper diagonal) Swiss public health institutions ($N = 1882$).

*Challenges in public communication about the pandemic*

The semi-structured interviews with representatives from Swiss public health institutions revealed challenges in three main categories: organizational structure, the multi-systemic nature of the pandemic, and public expectations.

From an *organizational structure* perspective, participants reported a significant lack of pandemic knowledge, hindering their ability to disseminate accurate information. Crisis communication training was lacking, making it difficult to tailor messages for diverse audiences. Resource shortages in communication efforts despite pandemic-related communication being a top priority posed challenges. Moreover, rigid deadlines and navigating political and structural requirements often complicated messaging coordination with stakeholder interests.

The *multi-systemic nature* of the pandemic presented the need to balance diverse stakeholder needs while ensuring public health objectives. Tensions arose from competing interests, such as those between public health measures and economic considerations. Media relations added complexity as news outlets questioned decisions by PHI and sensationalized or minimized communicated information in their coverage. Communication strategies by PHI

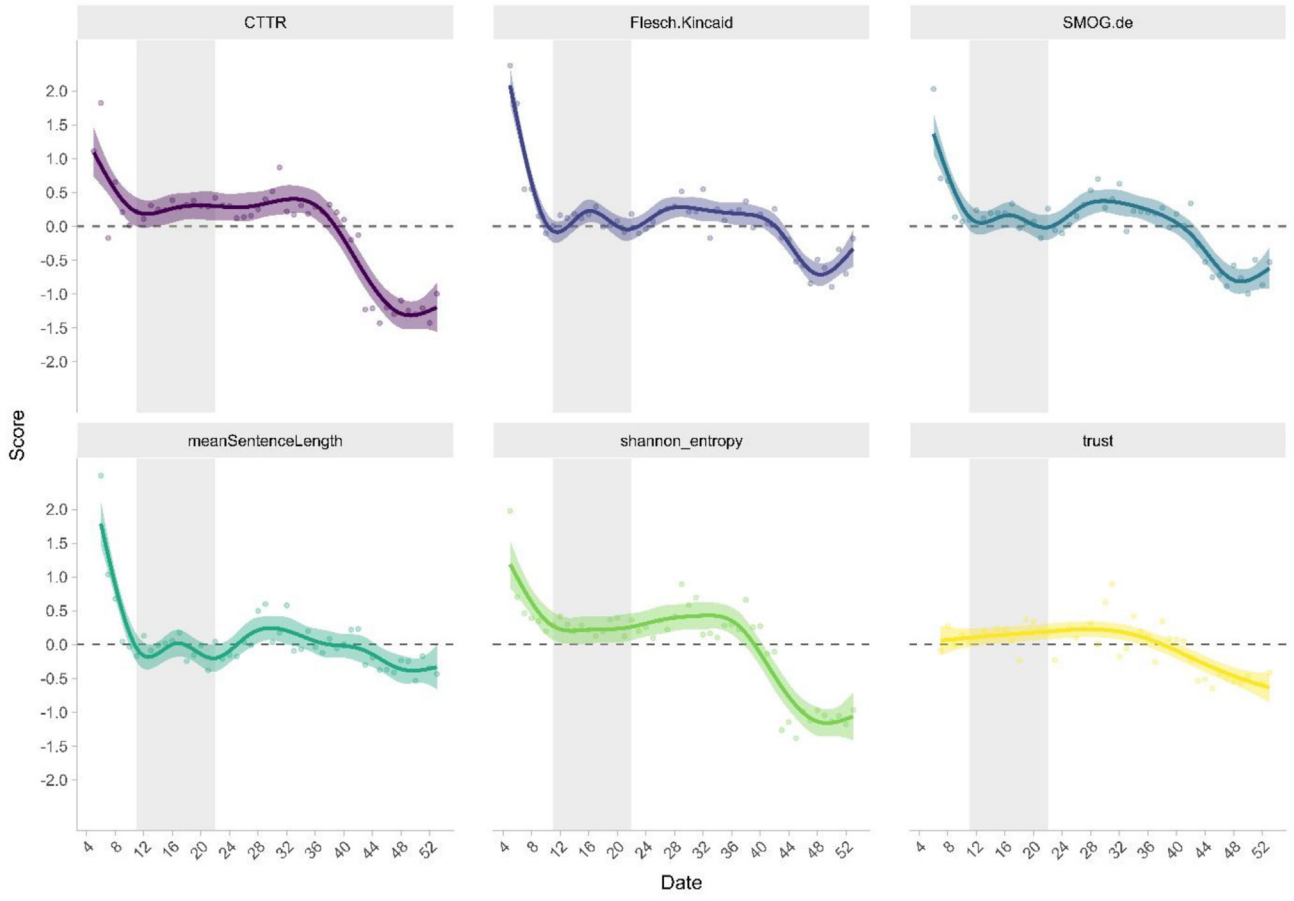


**Fig. 4.** Comparisons of linguistic properties of press releases issued by Swiss public health institutions over time. Notes: *CTTR* = Carroll's Corrected Type-Token Ratio, Flesch.Kincaid = Flesch-Kincaid Index, SMOG.de = German version of the Simple Measure of Gobbledygook, shannon_entropy = Shannon's entropy measure.

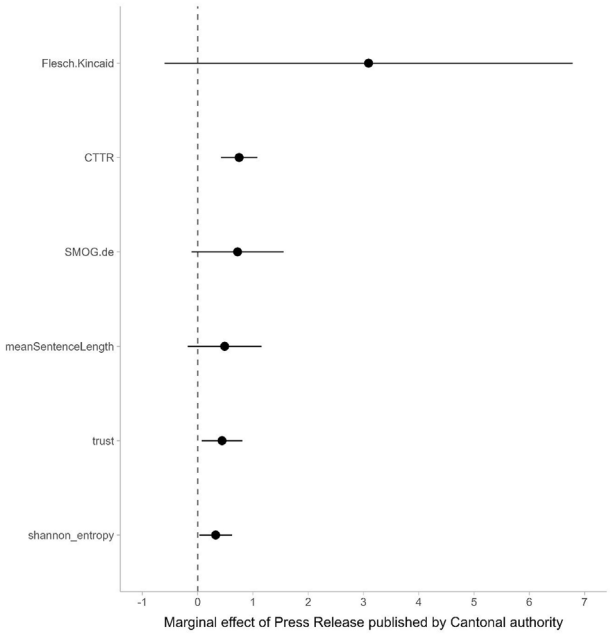


**Fig. 5.** Comparisons of linguistic properties of press releases issued by national and regional institutions.

were influenced by other regions, countries, and sectors, underscoring the complexity of the cross-sectorial information landscape public health communicators must navigate. Several interviewees deplored the insufficient cross-regional coordination and experienced the cantonal variation in implemented measures (e.g., opening hours of stores and non-essential facilities) as undermining the overall efficiency of containing the epidemiological situation.

Finally, a pivotal challenge confronted by PHI's was the management of the "*infodemic*"—a deluge of information that often overwhelmed the public. In the midst of all this information, PHI's were tasked with the critical balancing act of communicating about NPI's and contact tracing. The recurring emphasis on NPI's, including mask usage and physical distancing, became a cornerstone of public health messaging. These directives, paired with the introduction of tracing protocols, required consistent reinforcement to ensure public compliance and collective action. PHI's thus encountered the dual challenge of sustaining public engagement in health directives amidst information fatigue. Individuals grappled with the rapid pace of new information and the monotony of ongoing guidelines. In this landscape, fostering scientific and health literacy was paramount, necessitating that communication specialists not only distill complex and emerging evidence but also calibrate the simplicity of the message to maintain its efficacy without oversimplification.

General discontent in the public with due to the pandemic contributed to hesitancy and mistrust towards public health messaging, amplified by false information and conspiracy theories.

Addressing these challenges required targeted strategies to combat misinformation, improve scientific literacy, and foster public trust in public health messaging.

## Discussion

This study leveraged automated content analysis of press releases and semi-structured interviews with communication experts to investigate public communication of Swiss PHI during the first year of COVID-19. The quantitative results show little differences in the content of press releases by national and cantonal health authorities in terms of their content and linguistic make-up. Key themes in press releases shifted over time as the epidemiological situation during the pandemic evolved. The qualitative results reveal shared and unique day-to-day challenges faced by national and regional authorities while highlighting similar learning trajectories and implementation of communication routines over time. The quantitative and qualitative results can be combined into two key insights and implications.

First, our analyses highlighted the necessity of *agility* in public communication by PHI. The interviews revealed organizational structures as barriers to the responsiveness of responsive crisis communication. Yet the thematic and linguistic shifts in press release content over time suggest that PHI nevertheless managed to adapt to changing epidemiological situations. After an initial phase of shock and (regularly described as) "chaos" in the interviews, PHI developed communication routines adapted to the "new normal" of life under a pandemic, similar to findings regarding journalistic reporting of the pandemic[7] or the novel organization of work across industries.[42] This observation echoes existing calls for PHI to critically rethink and adjust their internal structures to allow for more agile modes of operation in times of crisis.[43,44] As with other more positive lessons learned from the pandemic—such as innovations in digital care[18]—it is crucial that these learned organizational routines are consolidated into available resources and programs for other potentially upcoming health crises.[16] This notably involves providing sufficient human resources and opportunities for specialized training in crisis communication.

Second, *coordination* within and between PHI is central to effective communication. Regional PHI emerged as thematic specialists in their press releases whereas the national PHI played the role of a thematic all-rounder. The interviews suggest that these different roles in shaping public health communication did not emerge harmoniously but constituted a significant challenge due to diffusely defined areas of responsibility between PHI. This finding extends calls for policymakers to revise and clarify the roles and responsibilities of different actors in public health frameworks to ensure streamlined communication and avoid contradictory public health messaging.[45] Moreover, the context of the infodemic forced PHI to navigate large streams of information—accurate and inaccurate—from political, economic, and health experts.[46,47] Yet efficient coordination within the structures of PHI is necessary to uphold the rapid cadence of public communication while safeguarding against misinformation.[13] A practical recommendation that can be derived from the interviews might be dedicated efforts to strengthen interdisciplinary collaboration in fact-checking information or developing public health messages.[48]

Although this study offers valuable insights into the communicative role of PHI during the pandemic and the challenges they encounter, there are several limitations to consider. This study focused on the content of COVID-related communication by PHI without directly evaluating its effectiveness. Future research could incorporate surveys or experiments to gauge the effect of communication efforts in influencing various public actors and audiences. Moreover, the present analysis of institutional health communication is restricted to press releases. Though a valuable tool for official communication, press releases may not fully capture the nuances of PHI's strategies or their engagement with the public. To further improve the understanding of communication by PHI, future studies should consider combining insights from press releases with media or social media analysis. It is important to note that the scope of our study does not include more informal or interpersonal efforts of PHI to build strong relationships with community leaders, influencers, and other key stakeholders. Yet these relationships play a crucial role in disseminating accurate information, addressing community-specific concerns, and gaining public trust which ultimately can impact social norms and behavior.[10,49] Regarding the semi-structured interviews self-selection in our participant sample may pose a risk of bias. However, interviewing individuals in their professional capacities at PHI's likely reduced the influence of personal predispositions, ensuring that the insights gleaned were reflective of institutional practices rather than individual opinions. Finally, the current focus on challenges faced by PHI in implementing their communication strategies does not pre-empt the need for more formal evaluations of communication programs. Systematic program evaluation is needed to assess the efficacy and efficiency of communication processes in PHI to establish an evidence-based practice.[16,50]

In conclusion, this study provides valuable insights into the communication efforts of PHI in Switzerland during the COVID-19 pandemic. Given the ongoing global health challenges and the potential for future health crises, it is crucial for scholars and practitioners to critically evaluate these efforts. Understanding the content, delivery, and challenges faced by PHI in their communication efforts helps preparing for future health crises. Ultimately, effective communication by PHI plays a vital role in managing public responses, enforcing preventive measures, and fostering public trust. All of which are crucial for mitigating the impact of global health emergencies.

## Author statements

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*Ethical approval*

The study obtained ethical approval from the Ethics Committee Northwest and Central Switzerland regional ethics committee (Req-2020-01306).

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*Competing interests*

The authors declare no competing interests.

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