



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



CENTERIS - International Conference on ENTERprise Information Systems / ProjMAN - International Conference on Project MANagement / HCist - International Conference on Health and Social Care Information Systems and Technologies 2021

Face masks on Instagram: an analysis of public health authorities' guidance toward prevention

Pâmela Araujo Pinto^{a*}, Fellipe Sá Brasileiro^b, Maria João Lopes Antunes^a, Ana Margarida Pisco Almeida^a

^a*DigiMedia/Department of Communication and Art/University of Aveiro, Aveiro, 3810-193, Portugal.*

^b*Communication Department/ Federal University of Paraíba, João Pessoa, 58051-900, Brazil.*

Abstract

Instagram (IG) has been used as a health promotion tool by national and international sanitary authorities to tackle COVID-19. The profile of the World Health Organization (WHO) on IG contributed to spread and update information on the new coronavirus prevention. This study focuses attention on a non-pharmaceutical control measure (face mask in the community) and discusses the adaptation of health authorities from Portugal and Brazil to WHO guidelines on this topic, and how they passed them to citizens. A content analysis of posts from WHO, Portuguese National Health Service (NHS), and the Brazilian Ministry of Health (MH) profiles on IG was carried out, in the first 100 days of the pandemic. The sample is composed of 65 posts - WHO (12), NHS (36) and MH (17). NHS highlights masks in 8,8% of posts and MH in 3,3%. WHO guidelines followed scientific evidence and prioritized the surgical masks, while NHS and MH adapted the guidelines to regional scenarios (community transmission and difficulty to social distancing) and produced information on non-surgical masks. NHS recommends the use of certified non-surgical masks. MH diverged from WHO guidelines and advised cloth masks. NHS has adopted the preventive approach and the use of celebrities to stress the importance of following its guidelines. MH adopted an institutional approach to encourage adherence to the instructions. Both profiles offered incomplete content on the production, use, disposal, and maintenance of masks.

© 2021 The Authors. Published by Elsevier B.V.

This is an open access article under the CC BY-NC-ND license (<https://creativecommons.org/licenses/by-nc-nd/4.0>)

Peer-review under responsibility of the scientific committee of the CENTERIS –International Conference on ENTERprise Information Systems / ProjMAN - International Conference on Project MANagement / HCist - International Conference on Health and Social Care Information Systems and Technologies 2021

* Corresponding author. Tel.: +351-913-568-694.

E-mail address: pinpamela@gmail.com

Keywords: Public Health; COVID-19; Face Mask; Health Authorities; Social Media.

1. Theoretical Framework

On the first 100 days of the COVID-19 pandemic, the World Health Organization (WHO) issued three updates on the use of masking as a non-pharmaceutical prevention measure for the new coronavirus. They were adapted according to scientific evidence, to the availability of supplies, and to the epidemiological contexts of its 194 member countries. This information was disseminated through the approach of emergency risk communication (ERC), to allow people most at risk to understand and adopt protective behaviors (1,2). Content was published on WHO's website and Social Media (SM). The circulation of these updates on SM proved to be relevant to combat the infodemic, an outbreak of misinformation on COVID-19, in uncertain scenarios (3-5). Throughout 2020, a constant mutability of facts and recommendations related to the new coronavirus was observed, accompanied by abundant scientific production and an inability to absorb this information by society, policymakers, and researchers (1).

SM and websites were used as information supports of health institutions in the pandemic of COVID-19 (2–6). Disseminating information on prevention and monitoring (and addressing) misinformation and were highlighted as the strategic functions of these channels. To (7) SM are tools of e-government to increase dialogue with stakeholders and government. These authors stressed that SM could help citizens with democratic participation, engagement, and transparency. Instagram (IG) has distinguished itself both as a space for mediating information from health authorities and for the disinformation disseminated during the pandemic (3,8–14). IG has been used as a health promotion tool for sanitary authorities (3,15,16), especially during crises (17–19). The qualities of this application (app) are the effectiveness of communication through images, the agility to update segmented content, and the monitoring of strategies in real-time (18,20). Since March 24th the IG has inserted instructive resources in the searches on COVID-19 made by users, directing them to the @who profile and the websites of national Health Authorities (HA) (21). This app was created in 2010, and since 2018 has more than 1 billion active users (22). IG has been used by non-governmental institutions such as WHO (since 2011) to assist in the strategic communication of these agencies. In this study, we focus attention on the adaptation of HA from Portugal and Brazil to WHO guidelines on the use of face masks in the community. The guidelines for the use of this protection to prevent COVID-19 have remained broadly inconsistent across nations (23–25). Portugal and Brazil offer relevant contributions to this discussion: they provide a free and universal health system; they have internal diversity among regions, and they had different strategies to face the crisis. In the first year of the pandemic, Portugal followed WHO guidances and stimulated the social distancing of the population – with two lockdowns (March and June of 2020; January and April of 2021). In the same period, Brazil becomes the second country with more cases of COVID-19 in the world. The health crisis was amplified by a political crisis in which the president neglected the severity of the pandemic (26,27). IG is expanding in both countries: it has passed 4 million users to 5,4 million users in Portugal (52,8% of population) in the last year (28); and Brazil has the third-largest number of users in this app, with 99 million users (46,9% of population) (29). The profile of Brazilian Ministry of Health (MH) was created in 2013, and the Portuguese National Health Service (NHS) profile was created in 2017.

1.1. Mask guidelines summary

WHO distinguished masks as surgical and non-surgical. The first are made of material resistant to the penetration of fluids and is used in surgery - receives certification; non-surgical are produced by citizens using textile materials, and is not personal protective equipment (PPE). On January 29th (30), WHO indicated that the use of masks should be exclusive to health care workers, home caregivers for people with suspected or confirmed cases of COVID-19, and persons with respiratory symptoms. The first WHO advice on the use of masks in the pandemic was published on April 6th, 2020 (31). The guide oriented about the use of the mask in communities, during home care, and in health care settings in areas that had reported cases of COVID-19. The document stressed that “the use of a mask

alone is insufficient to provide an adequate level of protection, and other measures should also be adopted” (31). The indication for the use of a surgical mask was maintained in the profiles cited above. It was reiterated that this PPE should be reserved for health care workers. The guidance suggested that decision-makers should consider the use of a mask by the vulnerable. The text guided on the correct use of masks maintained a neutral stance on the adoption of non-surgical masks in the community, justified by the lack of scientific evidence. WHO reinforced the importance of developing a strong communication strategy to explain facemask use to the population. On April 2020, Portugal was already in the mitigation phase (due to community transmission) and aligned with the WHO’s guidance. The NHS/General Direction of Health (GDH) established new standards for the use of the mask in the community (32), on April 13th: the use of non-medical masks by all persons who remain indoors with multiple people, as a measure of additional protection to social distance, hand hygiene, and respiratory etiquette. The use of the surgical mask has expanded: more vulnerable people should wear this PPE, as well as professional groups whose activity does not allow physical distance. MH published an information note on April 4th (33) and the National Agency for Sanitary Surveillance (ANVISA) launched the guide General Guidance – Face masks of non-professional use, on April 3rd (34). Both documents recommended the use of non-medical masks by the community. MH suggested that population can produce their own homemade masks, using fabrics that can ensure good effect if they are well designed and sanitized correctly. These standards were influenced by the update of the Centers for Disease Control and Prevention (CDC-EUA), that on April 3rd recommend that people wear fabric masks in public settings where social distancing is a challenge (24). Only on June 5th, WHO updated the guidance and informed that “At the present time, the widespread use of masks by healthy people in the community setting is not yet supported by high quality or direct scientific evidence and there are potential benefits and harms to consider” (35). The guidelines considered scenarios with community transmission and guided how to make and to use non-surgical masks. The use of this device was oriented to areas with known generalized transmission and limited capacities for the implementation of other containment measures and in contexts of high population density. The mask must be used in public places, indoors, and on public transport. People aged 60 or over and individuals with chronic illnesses should wear a surgical mask when leaving home.

2. Methodology

This study aims to answer the question of how national public health authorities adapted the guidelines of WHO for prevention of COVID-19, namely on the use of face masks, and passed them on to citizens, through SM. It aims at presenting strategies for adapting WHO guidelines by the HA of Portugal and Brazil, on IG. IG was the platform chosen for this study due to its expansion and its increasing use to address health issues. A content analysis (36) of WHO, NHS, and MH posts was carried out. Posts containing captions with information on the use of the mask by people during the pandemic were selected. This preventive strategy is a novelty in the routines of a significant part of the affected citizens, and the guidelines regarding it have remained broadly inconsistent across nations and regions (23,24). The monitoring period comprised the first 100 days of the pandemic on IG: started on March 11th, with its announcement by WHO, and ended on June 18th, 2020. Data collection also included documents for the use of the mask to follow the changes in the guidelines for citizens. The sample is composed of 65 posts - WHO (12), NHS (36) and, MH (17). It included all posts on masks published by the three authorities in the above-mentioned interval. The analysis was divided into two stages. First, we considered the posts of the three institutions from a quantitative perspective of the proposed categories. Lastly, we quantitatively analyzed four posts from each HA to exemplify the changes in recommendations regarding the use of masks in Portugal and Brazil. The second stage also pointed out audience indicators (likes and views) and the strategies used for the images. Data were extracted with the software Instabro. The categories of analysis of the posts were elaborated from the WHO recommendations for good practices of wearing this non-pharmaceutical control measure to be highlighted in communication actions (31): a) when to use the mask; b) who should use it; c) how to put it; d) combines with other infection prevention; e) advice on disposal; f) types of mask. The hypotheses of this study are: H1 - The WHO’s guidelines on the prevention of COVID-19 about face mask use have been adapted during the health crisis by the two HA on IG; H2 - The informational adaptation on the use of mask in the two profiles on IG was different.

3. Results

Between March 11th and June 18th, HA considered IG as a platform to expand information on masks' use to citizens. While HA highlighted the subject progressively, WHO focused on quoting masks in June (66,0% posts) – when it indicated textile masks. The guidelines on the use of the mask made by WHO are reflected in the reorientation of the approaches of the NHS and MH. Both followed WHO's strategies based on risk communication to promote community engagement on prevention and reduces threats to public health. They produced illustrated cards (publication containing text and images), videos, and captions with orientation on COVID-19 to disseminate information and stimulate prevention. NHS has adopted the preventive approach and the use of celebrities to emphasize the importance of following its guidelines. MH adopted an institutional and normative approach to encourage adherence to the recommendations. Table 1 gathers a summary of the results.

Table 1. *Summary of results.* Sources: the authors.

Profile	Followers (Jun 2020)	Posts (Mar-Jun 2020)	Post on Mask	When to use the mask	Who should use	How to put	Combines with other infection prevention	Advice on disposal	Types of mask
WHO	5.000.000	124	12 (9,6%)	-	50,0%	-	83,0%	41,6%	66,6% (surgical)
NHS	127.000	407	36 (8,8%)	47,0%	55,3%	38,8%	50,0%	19,4%	44,4% (surgical)
MH	2.200.000	510	17 (3,3%)	47,0%	-	41,1%	29,4%	5,8%	82,3% (fabric mask)

The WHO profile adopted a preventive approach. The messages on the surgical mask were prioritized. Cards with illustrations (58,3%) were privileged. The COVID-19 messages had an expressive reach, with an average of 68.251 likes (the general average of likes is 38.539) (37). During the first 100 days of the pandemic, 83,0% of the posts of NHS profile were on COVID-19. The national authority's strategy was to combine informative content with statements from Portuguese public figures to stimulate prevention. It favored cards in 63,8% of the content. The messages on the topic had an average of 709 likes per publication (the general average of likes is 459). In March, five posts were made informing that people without symptoms should not wear the mask and that cloth masks should be avoided. After the WHO update (April 6th), the NHS detailed the profiles that should use this protection. When the post defined the audience that would use the device, there was correspondence to WHO guidelines. Between March and June, 77,0% of the MH profile posts on IG were addressed to COVID-19. The emphasis given in this content is institutional, with information on the government's actions to face the crisis. In the background, health promotion guidelines and preventive instructions are made. The information was not accurate regarding WHO recommendations: the profile prioritized guidelines on the use of the cloth (fabric) mask, from April 4th. The surgical mask was mentioned twice (March 22nd and April 4th), advising that this PPE should be prioritized for health workers and used by patients with symptoms (according to WHO). MH profile taught how to make cloth mask (23,5% posts), and this content had an expressive reach (e.g., video of April 11th, with 411.412 views). The cards were dominant (64,7%). The average of likes per post was 24.469 (this general average of @minsaude is 4.364). The approach used was informative, with imperative sentences.

3.1 Portuguese National Health Service

Four posts were analyzed to point different stages of advice on the use of the mask by NHS and to reveal the communications strategies used to adapt to the WHO guidelines. Figure 1 synthesizes the before and after of the contents, from the updates made on April 13th (by NHS). The March 28th post guided the community to non-use of the mask (a). The text was dominant in the card, with an illustration on mask, and the caption was generic. The image (b) presents the April 16th post, in which the caption addressed the use of masks in public places, without orienting the type of mask appropriate to each profile. The image of a surgical mask was used and complemented

with the text on combining face protection with distance. The reach of the two messages was high, with the image on the right being the second post with the most likes (1.549) in the NHS sample. Both highlighted the COVID-19 theme at the top of the image and added the website address for more information. In April, NHS changed the telephone number (for symptomatic) by COVID-19 site and prioritized cards with images.



Fig. 1: (a) Posts of NHS of March 28th; (b) April 16th, 2020. Source: Profile @sns_pt on IG.

Figure 2 illustrated the post of May 27th (left) with a public figure to disseminate information, on video (16,6% of the sample). However, the video and caption do not guide on when to use, and the type of mask was appropriate to the user's profile. On the date of this publication, Portugal was already guiding the population to the first de-confinement plan (started on May 4th). It would be important to produce content that reflects the needs of this stage of coping with COVID-19. The right image illustrates the sample's only post on NHS community masks, with indications on the use of certified devices. The June 1st message is a slide post, with five images to explain the correct way to use the mask (the image used is the 4th). The content combined text and illustrated images, and the caption emphasized the orientation to put the mask. The link to the NHS website was not informed to further the issue. The CITEVE (a private entity that certifies PPE) website was highlighted as a reference for citizens to verify the quality of non-surgical mask on sale. The NHS did not instruct users to make masks for virus protection until June 18th. The HA suggested that the population bought your mask instead of producing.



Fig. 2: (c) Posts of NHS of May 27th; (d) June 1st, 2020. Source: Profile @sns_pt on IG.

3.2 Brazilian Ministry of Health

MH also identified posts about COVID-19 in its feed, during the period analyzed. The captions are informative and indicate a website to deepening information. Figure 3 shows two phases in the adaptation of MH to WHO guidance. The March 22th post (e) presents information about surgical mask. It reinforced the orientation to target PPE to professionals. After the MH announced the use of non-medical masks by the community (April 4th), the profile instructed users on how to make and how to use a mask. The April 5th video (f) spoke about the inclusion of the mask as a preventive measure - however, it did not advise that it should be combined with other actions. The content covered how to make, use, and maintain protection. This post suggested that “it is worth dismantling that old shirt, piece of fabric, old pants, underwear, curtains, whatever it takes to make the mask” (38). There were no posts with scientific information about the cloth mask or guidance on the risks that the incorrect use of this object can cause. MH added the hashtags #MyMask and #GoInMask in posts made since April to encourage their use by users.



Fig. 3: (e) Posts of MH of March 22nd, (f) Apr. 5th, 2020. Source: Profile @minsaude on IG.

Figure 4 brings posts about the combination of the mask with other prevention strategies. The June 4th card (g) exposed information about the use of the mask by children, a public not previously mentioned in other profiles. The June 7th (h) card condensed information already distributed in isolation in previous posts into a single message. In both, the captions reaffirmed these messages of the texts and the pictures on the cards. MH did not cite the updating of WHO on the fabric mask until June 18th.



Fig. 4: (g) Posts of MH of June 4th 2020; (h) June 7th 2020. Source: Profile @minsaude on IG.

During the analyzed period, the NHS and MH used the IG as a real-time communication tool to update information about the new coronavirus. However, the guidelines on the use of masks indicate that the existing tensions in the adaptation of the use of this protection (23) by HA were also present in the content of their profiles in the IG. Results show the adaptation of national response efforts for integration with the international response.

In this period there was an increase in the digital presence of WHO, NHS, and MH in the IG: by the number of followers (March - June) 128,6%, 110,6%, and 217,0%, respectively; by the average of tanned, as mentioned; by the average of comments - WHO - 1.414 / the general average (g. a.) is 430; NHS - 723/5 (g. a.), and MH - 739/153 (g. a.). The content produced by HA on the pandemic increased, as the engagement tool of citizens through the interaction of comments. This scenario was different from that (6) mapped when analyzing the Zika outbreak. Even though these indicators are not sufficient to relate IG to growth in mask wear, they may suggest that information shared by HA has been widely viewed. Transparency, another possibility of using SM as an e-governance tool highlighted by (7), was not comprehensive in the profiles. The NHS chose not to disclose epidemiological data on the cases in the country in its IG - for the period under review. In Brazil, epidemiological data were published, but after the exchange of the minister of health (April 2020), they began to be modified and also underreported. Despite the emphasis given to the use of the mask, the contents of the two profiles showed flaws regarding the specifications requested by the WHO on its use: posts that did not determine when to use them predominated; the indications of discard (19,4% in Portugal and 5,8% in Brazil) and the combination of the use of the device with other forms of prevention (29,4% in Brazil) was low. The recommendations emphasized adults in urban environments. Only @sns_pt addressed vulnerable populations, different from (5) recommendations. The profiles explored the use of images, with emphasis on illustrations and videos. People were used to explaining about the mask in the posts (85,7% NHS and 70,5% MH).

4. Discussion

The (re) construction of an information scenario favorable to facing uncertainties (39), such as those involving the COVID-19 infodemia (1), requires a conciliation between the practical understandings built in the interactions and the official information produced and shared by public HA. Given the global difficulties imposed to create a practical understanding of information, the profiles of public HA on IG have assumed an extra responsibility for guidance and collective mobilization about health information (13). On the use of masks, however, the results show that the official information provided by the HA were divergent. This result corroborates the findings of previous studies on the guidelines for wearing masks (24), which reveal inconsistencies between nations.

Taking as a reference the analyzed profile circuit (Table 1), it is observed that the WHO guidance about the use of masks (e. g. surgical masks by professionals and risk groups) was adapted during the pandemic (e. g. NHS: masks in closed spaces and public transports) and reformulated by the authorities according to the realities in each country (e. g. MH: textile masks). This indicates two general movements: (i) the uncertainties at the beginning of infodemia caused HA to resort to WHO guidelines to align information and build links with scientific evidence; (ii) the demands for practical knowledge and emerging material-cultural conditions in countries suggested alternative measures to contain community transmission of the virus. It is noteworthy that these movements are common due to the very variability of scientific evidence due to cultural influences (1), which may alter some facts.

Table 2. *Guidance on mask use in NHS and MH profiles.* Sources: (40–42).

Profile	Guidance on Mask	Type of Mask	Who should use	Cases/ Mar. 11 th	Cases /Apr. 18 th	Cases /Jun. 18 th
WHO	January 29 th / April 6 th	Surgical	Professionals Patients, Home Caregivers (PPHC)	120.927	2.291.208	8.296.012
	June 5 th	Textile	Community			
NHS	April 13 th	Surgical	PPHC			
		Surgical or certificated mask	Community	59	18.388	12.555
MH	April 4 th	Textile	Community	52	36.739	978.142
		Surgical	PPHC			

It is important to stress that, at the beginning of the pandemic, the limitations manifested by the WHO in terms of the ability to guide accurate and adaptable information (13) added to contemporary political and cultural tensions (11) may have influenced the adaptations and reformulations of some HA. These limitations reflect the adoption of an information standard by WHO which, although based on scientific evidence and oriented to community involvement (43) was unable to adapt to emerging understandings (including misinformation) and build convergent understandings about masks (25). The NHS, for example, by recommending the use of non-surgical (certified) masks as an option, demonstrates an adaptation to WHO guidance to meet a logistical demand about the distribution of surgical masks in the country. This orientation, linked to the recommendation and adherence to social distance, maintains an understanding of the importance of quality control of the object and protection measures. MH, in turn, contrary to the WHO guideline, based on the material and cultural reality in the country (high economic inequality, stock of PPE, and difficulty in adhering to social distance) recommended the manufacture of fabric masks (new and reused as underwear) by the population. This position indicates a disconnection from the WHO guidelines as it completely reconfigures the understanding of the criteria of quality, safety, and use of the object. In light of these positions, the WHO has maintained the initial orientation practices regarding the types of masks and users (Tab. 2).

On the other hand, considering that the profiles assumed different WHO positions regarding the use of non-surgical masks, it is emphasized that they did not present information based on scientific evidence to justify the positions taken. This situation happened primarily in the MH profile, which anticipated the international scenario as to the generalized guidance on the use of masks manufactured under the guidance of the CDC (EUA). The WHO

and NHS guidelines emphasize that information about the use of the mask would be updated, according to new scientific data. In Brazil, the documents did not mention this possibility. In this country, there was an erasure about the discussion of scientific aspects about the use of the mask. The use of masks became mandatory in public spaces in both countries after the period investigated in this study. In Brazil, on July 3rd of 2020, and in Portugal, since October of 2020. These divergences reveal the formation of different general understandings on the use of masks by the analyzed health authorities, thus hindering the emergence of a broad scenario of global information. The practices of adaptation and segmentation of conflicting information contributed to the emergence of a state of informational uncertainty and, consequently, to the formation of information sub-scenarios in the analyzed circuit. This reality reinforces the argument that informational resilience on health measures has developed in different directions in the analyzed circuit (13), and draws attention to the need for communication aligned with sociocultural realities, but, above all, integrated between health authorities in the initial moments of health crises.

5. Conclusion

The analysis allowed to draw a vision of how IG was used by public HA as part of the communication strategy aimed at guiding the use of masks during the pandemic. The results indicate that IG contributed to the dissemination of preventive information on COVID-19, through the images shared by these authorities. Both explored the potential of this SM by guiding the use of masks in Portugal and Brazil. Profiles were also used to update information, which constantly changed on the first 100 days of the pandemic. NHS and MH guidelines about masks were influenced by regional and international standards that emerged during the process. In this sense, both profiles adapted and reformulated the WHO guidelines, such as the positioning on the use of non-surgical masks by the general population, indicating that the informational resilience of member countries followed distinct directions in the face of emerging informational challenges. Although justified by the material and socio-cultural reality of the countries, from the point of view of the international scenario, these variations may have amplified the uncertainties about the role of masks and influenced misuse. The content analysis on the use of masks in the NHS and MH on IG identified that this theme mobilized the users of both profiles, due to the expressive number of audience data. However, despite rules already established on this protection, the publications offered incomplete content on the production, use, disposal, and maintenance of the masks. There is a need to expand guidance on combining preventive measures when wearing the mask; the correct disposal of the device; the correct maintenance of the fabric masks; inclusion of profiles of citizens vulnerable to the virus in their respective contexts. Also was noted that both countries need to start a dialog with stakeholders to improve these platforms as a potential tool of e-government. This study has limitations on the number of WHO member countries analyzed to ascertain the adaptation to the standards of this institution. Another limitation relates to the failure to analyze the interactions of institutions with users through comments and shared content. Future studies may include comparing the adoption of WHO strategies to tackle COVID-19 in more countries – this would help identify other health agencies that influence national HA. Analysis of interactions with citizens in the comments can indicate whether there is a listening of the affected communities in the elaboration of the strategies, as indicated by the risk communication in public health emergency conducted by WHO. Such assessment can signal how these prevention guidelines are perceived by citizens.

Acknowledgements

This work was supported by Coordenação de Aperfeiçoamento de Pessoal de Nível Superior, Brazil, Funding Code 001.

References

1. Eysenbach G. How to Fight an Infodemic: The Four Pillars of Infodemic Management The World Health Organization Declares an Infodemic and Crowdsources a Framework. *J Med Internet Res*. 2020;22(6):21820.
2. Pennycook G, McPhetres J, Zhang Y, Lu JG, Rand DG. Fighting COVID-19 Misinformation on Social Media: Experimental Evidence for a Scalable Accuracy-Nudge Intervention. *Psychol Sci*. 2020;31(7):770–80.
3. Martin S, Karafillakis E, Preet R, Wilder-Smith A. The pandemic of social media panic travels faster than the COVID-19 outbreak Dengue Tools View project GBD 2013-2015. *Artic J Travel Med* [Internet]. 2020;(March). Available from:<https://tinyurl.com/9j7nbf3>
4. Mesquita K, Ruão T, Andrade JG. Covid-19 pandemic , communication and relationship : an analysis of the social media of the University of

- Minho. *Rev Comun.* 2020;9:31–56.
5. Rudd R, Baur C. Health literacy and early insights during a pandemic. *J Commun Healthc.* 2020;13(1):13–6.
 6. Lwin MO, Lu J, Sheldenkar A, Schulz PJ. Strategic uses of facebook in zika outbreak communication: Implications for the crisis and emergency risk communication model. *Int J Environ Res Public Health.* 2018;15(9).
 7. Tursunbayeva A, Franco M, Pagliari C. Use of social media for e-Government in the public health sector: A systematic review of published studies. *Gov Inf Q [Internet].* 2017;34(2):270–82. Available from: <http://dx.doi.org/10.1016/j.giq.2017.04.001>
 8. Villegas-Tripiana I, Villalba-Díaz A, López-Villegas A. Análisis de la información sobre COVID-19 en sitios web de organizaciones públicas sanitarias. *Rev Española Comun En Salud [Internet].* 2020 Jul 16;1:234. Available from: <https://tinyurl.com/trw3vsyv>
 9. Soares FB, Recuero R, Viegas P, Bonoto C, Hüttner LR. Cloroquina e desinformação sobre Covid-19 na mídia social do Brasil. In: Martins, Ana Tais; Freitas C, editor. *Pesquisas comunicacionais em interface com arte, tecnologia, religião, meio ambiente.* São Paulo: Pimenta Cultural; 2021. p. 474.
 10. Rovetta A, Bhagavathula AS. Global Infodemiology of COVID-19: Focus on Google web searches and Instagram hashtags. 2020;
 11. Kakutani M. La muerte de la verdad: notas sobre la falsedad en la era Trump. Barcelona: Galáxia Gutenberg; 2019.
 12. Salaverría R, Buslón N, López-Pan F, León B, López-Goñi I, Erviti M-C. Desinformación en tiempos de pandemia: tipología de los bulos sobre la Covid-19. *El Prof la Inf.* 2020;29(3):e290315.
 13. Pinto PA, Brasileiro FS, Antunes MJ, Almeida AMP. COVID-19 no Instagram: práticas de comunicação estratégica das autoridades de saúde durante a pandemia. *Comun Pública [Internet].* 2020;15(29):1–18. Available from: <https://journals.openedition.org/cp/11288>
 14. Pinto PA, Lopes Antunes MJ, Pisco Almeida AM. Public Health on Instagram: an analysis of health promotion strategies of Portugal and Brazil. *Procedia Comput Sci [Internet].* 2021;181:231–8. Available from: <https://tinyurl.com/5emxzpna>
 15. Fung ICH, Blankenship EB, Ahweyevu JO, Cooper LK, Duke CH, Carswell SL, et al. Public Health Implications of Image-Based Social Media: A Systematic Review of Instagram, Pinterest, Tumblr, and Flickr. *Perm J.* 2019;24:1–10.
 16. Weitzel T, Middleton J. What channels are countries using to communicate with the public and at what frequency? [Internet]. COVID-19 Health System Responde Monitor. 2020. Available from: <https://tinyurl.com/38hapebs>
 17. Guidry JPD, Carlyle KE, Larose JG, Perrin P, Messner M, Ryan M. Using the health belief model to analyze instagram posts about Zika for public health communications. *Emerg Infect Dis.* 2019;25(1):179–80.
 18. Tang L, Bie B, Park SE, Zhi D. Social media and outbreaks of emerging infectious diseases: A systematic review of literature. *Am J Infect Control [Internet].* 2018;46(9):962–72. Available from: <https://doi.org/10.1016/j.ajic.2018.02.010>
 19. Seltzer EK, Horst-Martz E, Lu M, Merchant RM. Public sentiment and discourse about Zika virus on Instagram. *Public Health.* 2017;150(215):170–5.
 20. O'Donnell NH, Willoughby JF. Photo-sharing social media for eHealth: analysing perceived message effectiveness of sexual health information on Instagram. *J Vis Commun Med [Internet].* 2017;40(4):149–59. Available from: <https://tinyurl.com/2vydek7x>
 21. Limaye RJ, Sauer M, Ali J, Bernstein J, Wahl B, Barnhill A, et al. Building trust while influencing online COVID-19 content in the social media world. *Lancet Digit Heal [Internet].* 2020;2(6):e277–8. Available from: [http://dx.doi.org/10.1016/S2589-7500\(20\)30084-4](http://dx.doi.org/10.1016/S2589-7500(20)30084-4)
 22. Statista. Number of monthly active Instagram users 2013-2018 [Internet]. 2019. Available from: <https://tinyurl.com/47acn2cv>
 23. Cheng VC-C, Wong S-C, Chuang VW-M, So SY-C, Chen JH-K, Sridhar S, et al. The role of community-wide wearing of face mask for control of coronavirus disease 2019 (COVID-19) epidemic due to SARS-CoV-2. *J Infect [Internet].* 2020;81(1):107–14. Available from: <http://www.sciencedirect.com/science/article/pii/S0163445320302358>
 24. Laestadius L, Wang Y, Ben Taleb Z, Kalan ME, Cho Y, Manganello J. Online National Health Agency Mask Guidance for the Public in light of COVID-19: A Content Analysis. *JMIR public Heal Surveill [Internet].* 2020;6. Available from: <https://tinyurl.com/46ewdvjs>
 25. Missoni E, Missoni E, Armocida B, Formenti B. Face masks for all and all for face masks in the COVID-19 pandemic: Community level production to face the global shortage and shorten the epidemic. *Disaster Med Public Health Prep.* 2020;1–5.
 26. Abrucio FL, Grin EJ, Franzese C, Segatto CI, Couto CG. Combate à COVID-19 sob o federalismo bolsonarista: um caso de descoordenação intergovernamental. *Rev Adm Pública.* 2020;54(4):663–77.
 27. Alcantara J, Ferreira R. A infodemia da “gripezinha”: uma análise sobre desinformação e coronavírus no Brasil. *Chasqui Rev Latinoam Comun [Internet].* 2020;1(145):137–62. Available from: <https://revistachasqui.org/index.php/chasqui/article/view/4315/3381>
 28. Statista. Instagram users Portugal 2021 [Internet]. 2021. Available from: <https://tinyurl.com/yakww6mk>
 29. Statista. Statista Instagram Users [Internet]. 2020 [cited 2020 Jan 8]. Available from: <https://tinyurl.com/47ybfk>
 30. WHO. Advice on the use of masks in the community January. 2020;2020(January):2019–20.
 31. World Health Organization. Advice on the use of masks in the context of COVID-19: interim guidance-2. *Guía Interna la OMS.* 2020;(April):1–5.
 32. Direção Geral de Saúde. Plano Nacional de Preparação e Resposta à Doença por novo coronavírus (COVID-19) [Internet]. Plano Nacional de Preparação e Resposta à Doença por novo coronavírus (COVID-19). Lisboa; 2020. Available from: <https://tinyurl.com/25zxf9m>
 33. Brasil, Saúde M da. Nota Informativa Nº 3/2020-Cggap/Desf/Saps/Ms [Internet]. Ministerio da Saúde. 2020. Available from: <https://tinyurl.com/3yzkekjk>
 34. Anvisa. Orientações-Máscaras faciais de uso não profissional [Internet]. Brasília; 2020. Available from: <https://tinyurl.com/ccme6hzh>
 35. World Health Organization (WHO). Advice on the use of masks in the context of COVID-19: interim guidance, 5 June 2020. [Internet]. 2020. Available from: <https://apps.who.int/iris/handle/10665/332293>
 36. White MD, Marsh EE. Content analysis: A flexible methodology. *Libr Trends.* 2006;55(1):22–45.
 37. Ninjalitics [Internet]. 2020. Available from: <https://www.ninjalitics.com/minsaude.html>
 38. Brazil. Instagram [Internet]. Ministry of Health Brazil. 2020 [cited 2020 Aug 10]. Available from: <https://tinyurl.com/2zh6rf6w>
 39. Lloyd A. Building Information Resilience: How do Resettling Refugees Connect with Health Information in Regional Landscapes - Implications for Health Literacy. *Aust Acad Res Libr.* 2014;45(1):48–66.
 40. Statista. Gobar COVID-19 Cases [Internet]. 2020 [cited 2020 Oct 1]. Available from: <https://tinyurl.com/k3x5pzw>
 41. Serviço Nacional de Saúde. COVID-19 cases [Internet]. 2020 [cited 2020 Oct 1]. Available from: <https://tinyurl.com/yxapxfew>
 42. Saúde M da. COVID-19 cases [Internet]. [cited 2020 Oct 1]. Available from: <https://covid.saude.gov.br>
 43. World Health Organization. Comunicação de riscos em emergências de saúde pública. Genebra: Organização Mundial da Saúde; 2018.