Gaps and blind spots limiting the efficacy of provaccine communication strategies: case studies of World Health Organization and South African government strategies

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Introduction: Vaccine communication strategies are essential for guiding effective provaccine communication to overcome vaccine hesitancy and address false information about vaccines. This research investigated whether the World Health Organization (WHO) and the South African government COVID-19 vaccine communication strategies helped define a suitable approach to provaccine communication and sufficiently upskilled vaccine communicators.

Methods: A close textual reading was applied, with the contents being coded based on six elements of effective communication (power, desire, audience, framing, aesthetics and tools).

Results: The study found that the strategies were not sufficiently rooted in communication theory, and mainly focused on appropriate dissemination tools. Both strategies strongly recommended audience listening and monitoring but neither provided detail on how audience analysis should influence communication approaches. The documents also provided many examples of possible messages but did not discuss framing as a strategic exercise. Further, although the documents mentioned audiences' emotional states occasionally, they barely suggested methods for achieving positive affective states, including minimal mentions of aesthetics. Power was marginally mentioned in the WHO strategy but was not considered at all in the South African strategy.

Discussion: Because of the gaps in the strategy documents and the heavy focus on dissemination tools, communicators are not sufficiently equipped to develop persuasive campaigns to build solidarity and trust. Understanding power, the flow of desire and aesthetics are not just nice-to-have but are key persuasive elements in communications strategies, which must be incorporated into holistic vaccine communication strategies if we hope to address vaccine hesitancy and stem the flow of false vaccine information.

KEYWORDS

vaccine communication strategy, desire, framing, aesthetics, audience, power, South Africa, World Health Organization

Introduction

Vaccine hesitancy or refusal to vaccinate (colloquially called "anti-vax") emerged after the infamous 1998 publication in *The Lancet* of an article erroneously linking the MMR-vaccine and autism. Since the article was not retracted for 12 years, false information about vaccines continued to gain momentum, reaching alarming levels with the introduction of the first COVID-vaccine (Lamb, 2021; Walter et al., 2023). The World Health Organization has recognized false vaccine information (especially on social media) as one of the top ten threats to global health because it has led to many parents no longer vaccinating their children, resulting in a resurgence in preventable diseases and related deaths (Piedrahita-Valdés et al., 2021).

Effective, persuasive communication is essential for addressing vaccine hesitancy and increasing awareness about vaccine efficacy (Ekezie et al., 2024). Effective provaccine communication is rooted in effective communication strategies that bridge the gaps between government, public health institutions and practitioners, and the public (Panjaitan et al., 2023). The approach adopted in the communication strategy influences the communication approach used in provaccine campaigns (Hyland-Wood et al., 2021). Gaps in strategies lead to gaps in thinking when developing campaigns, thus limiting their efficacy so there is "a pressing need to use the most effective strategic communication practices to motivate adoption of the best guidelines" to incorporate all elements of effective science and vaccine communication (Kreps, 2023, p. 132). Identifying the strengths and weaknesses of existing strategies can bolster efforts to improve strategic thinking that will flow into better communication campaigns, for "improved public health outcomes" (Panjaitan et al., 2023, p. 152).

Concerningly, a study of 15 US national and state-level COVID-19 provaccine communication strategies found that they "were not end-user focused, only 'checked the box' when communicating with historically under-resourced communities, were largely broadcast-focused and rarely involved two-way engagement strategies or tactics, demonstrated poor use of online communication approaches and failed to moderate campaign comment boards/social media sites, and commonly targeted 'intermediary' audiences with materials that were not 'end user ready'" (Quinn et al., 2023, p. 54). However, I could not locate similar studies evaluating the World Health Organization (WHO) strategy document or African country strategies.

Because the WHO provides important direction to many governments, it is important to assess if its COVID-19 vaccine communication strategy document adequately informs national strategies. South Africa has one of the highest rates of vaccine hesitancy and highest exposure to false vaccine information in Africa (Cooper et al., 2021; Osuagwu et al., 2023); effective provaccine communication strategies are needed to address these challenges. Therefore this study considers the World Health Organization (WHO) strategy launched on 22 December 2020: *Covid-19 vaccines: Safety surveillance manual: Covid-19 vaccine safety communication* (WHO, 2020), and the South African National Department of Health (NDOH) strategy launched on 26 January 2021: *SA COVID-19 Vaccine rollout communication strategy: Mapping the road ahead* (DOH, 2021). The aim was to assess if these strategies sufficiently highlight key elements of powerful, persuasive provaccine communication to overcome vaccine hesitancy. If the strategy

documents clearly outline the components of effective provaccine communication, this forms a solid basis for developing powerful, persuasive provaccine campaigns. This paper compares the two strategy documents with the literature on science communication and pro-vaccine communication, using Pointer's (2024) conceptual model to highlight key elements of powerful, persuasive provaccine communication.

Literature review

Science communication is typically regarded as affording people "a shared understanding of the facts" to influence their decision-making (Fischhoff, 2013, p. 14033). However, this approach to science communication is rooted in the "knowledge deficit model," which does not consider the elements of persuasive communication, the mental shortcuts we use for evaluating information, and the political nature of science (Simis et al., 2016). Such communication creates hierarchical power relationships between the scientist/science communicator and audiences, which can lead to audiences feeling alienated (Humm et al., 2020). The model also ignores that facts alone do not change people's minds (Toomey, 2023). Further, this model ignores and excludes marginalized and minoritized groups, such that science and science communication uphold and exacerbate racism, classism, sexism and other forms of oppression (Canfield et al., 2020). Hence, it is important to acknowledge values and political power as inherent to science communication (Hyland-Wood et al., 2021).

To make science and science communication inclusive, deliberate efforts must be made to reduce hostility and competition, in favor of more collaborative approaches, which acknowledge that non-Westerners are no less "able to observe, deduce, hypothesize, experiment, and make sense of their worlds than their European or European American counterparts" (Bang et al., 2018, p. 150). Further, science communication needs to pay more attention to "empathy, understanding and communication of shared values and motivations" (Berditchevskaia et al., 2017, p. 1), including the cultural, social, political and religious influences of scientists and their audiences (Seethaler et al., 2019). Science communication needs to be more values-oriented, reduce hierarchy through dialogue (Smallman, 2016) and recognize other forms of knowledge, including indigenous knowledge (Bang et al., 2018).

Countering vaccine misinformation

If vaccine communication, as a form of science communication, is to overcome vaccine hesitancy, it needs to pay attention to power dynamics, culture, values and non-hierarchical approaches, which consider social psychology and audiences emotions (Chou and Budenz, 2020; Hyland-Wood et al., 2021). Amid an infodemic of false vaccine information, scientists and science communicators must resist falling back on a deficit model wherein the audience is posited as having insufficient evidence and insufficient "science literacy", i.e., knowing how science information is produced, packaged and shared (Howell and Brossard, 2021). Instead of focussing on deficits, consideration must be given to the techno-socio-economic-political processes that produce false information, and similarly tailor accurate scientific communication to the current

techno-socio-economic-political milieu – including the structure of media environments in which science communication is disseminated (Scheufele and Krause, 2019). This milieu will differ from place-to-place depending on different access to technology and socio-economic-political structures and practices. Specifically, attention must be given to the most marginalized audiences to increase inclusivity.

Arguably, "an effective communication strategy is a two-way process that involves clear messages, delivered via appropriate platforms, tailored for diverse audiences, and shared by trusted people" (Hyland-Wood et al., 2021, p. 1). A strong communication strategy "articulates, explains and promotes a communication vision and a set of communication goals in a good formulation" and outlines the key plans, actions and approaches to be taken at each stage of communication (Panjaitan et al., 2023, p. 154). Further, an effective strategy incorporates "appropriate theory and effective processes" (Gupta et al., 2021, p. 97). The strategy should explain communication "ideas, preferences and methods" and how they connect to the goal (Cornish et al., 2011). Hence, communication strategies need to encompass all elements of communication in a holistic way to effectively inform provaccine campaigns. This paper uses Pointer's (2024) conceptual model to illustrates the key elements of communication strategies and how they work together, as discussed below.

A conceptual model for science communication: filling the gaps and making the connections

Although vaccine communication needs to be targeted and tailored for specific audiences, effective communication consists of a few key components, as shown in Figure 1: power, desire, audience, framing, aesthetics (including affect), and communication tools

[adapted from Pointer (2024, p. 5)]. Each concept is linked to issues highlighted in the literature review, but the model additionally shows how these concepts work together: the different elements of communication can be considered like cogs in a machine, and all cogs need work properly if the machine is to function well. Hence, this communication model is a "machinic assemblage," a notion developed by Deleuze and Guattari (2004) to illustrate how humans connect different material and conceptual elements to produce a flow; the different material and conceptual elements form a stable structure (machine) but energy (power) drives the movement of the parts, generating outputs. In the case of the communication machine, illustrated in Figure 1, the different cogs work together to produce powerful, persuasive communication strategies. If a communication strategy does not consider all elements of the machine, it impacts on the functioning of the machine or even breaks the machine, leading to poor communication campaigns and outputs. Further, the strategy must show how the different elements work together to generate a flow of communication. If the elements are not linked and do not flow, the strategy cannot generate empowering, persuasive campaigns.

The components shown in Figure 1 are further elaborated below.

Power

As already discussed, hierarchical science communication has led to some audiences distrusting or disengaging from science and science communication, especially those from marginalized communities or cultures that understand science differently (Canfield et al., 2020). Provaccine communication processes therefore need to generate non-hierarchical relationships between scientists/healthcare workers and their audiences to addresses power inequalities (Hyland-Wood et al., 2021). The communication process should build international solidarity so that audiences understand diseases as a global problem, not an individual one, and therefore recognize global cooperation on
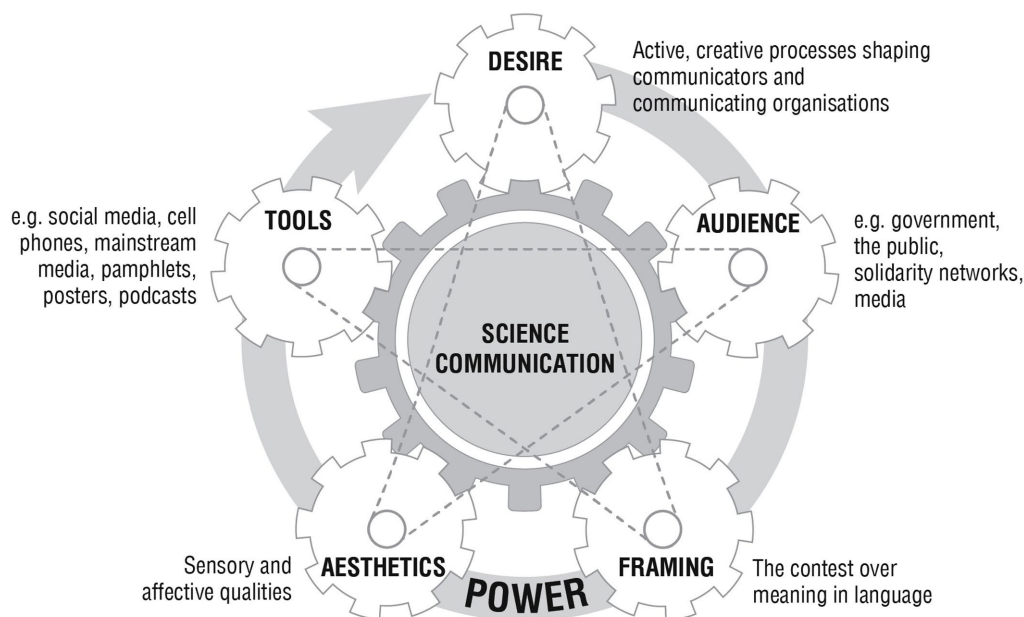

FIGURE 1
The components of an effective science communication machine.

vaccines as necessary for preventing pandemics (Leuffen et al., 2023). Empowerment is, therefore, both an important consideration when designing communication processes and the key biproduct of effective communication. In the case of African communication, African-communitarian values such as altruism, reciprocity and collective responsibility can be mobilized to develop powerful, persuasive provaccine campaigns (Ewuoso et al., 2022) so that audiences "feel empowered to make autonomous decisions in favor of vaccination" (Ogugua et al., 2024, p. 886).

Desire

The concept of desire is rarely discussed in science communication, but it has been central to advertising communication since Sigmund Freud's nephew, Bernays (1928) wrote about audience desire as a key element of public relations and propaganda for persuading audiences to buy products. Arguably, manipulating desire has made advertising the most influential communication for promoting capitalism and consumption today (Savat and Harper, 2016). Using desire in communication involves making an tapping into the psyche of audiences to make emotional connections using creativity, narrative and aesthetics. However, advertising relies on desire as a lack, i.e., the audience lacks a particular item and yearns for it. For Deleuze and Guattari (1983), desire is not a lack, but rather a driving force for human production, that is, humans desire to create and produce things by making connections between (material and conceptual, abstract and physical) things, including the desire to connect with other people to make the world a better place. Making these connections involves creating machinic assemblages that use power to generate outputs. The more creative and aesthetically pleasing (beautiful) a flow, the more likely people are to connect to it; hence, humans connect to consumer products through the flow of creative narrative and aesthetic communication (De Burgh-Woodman, 2018). Human beings seek out creativity and beauty, so these are essential elements for captivating an audience and grabbing attention (Fitzpatrick, 2013). Hence, powerful, persuasive communication campaigns ignite desire to create connections and generate flow.

Effective communication strategies must address the physical, scientific *and* symbolic aspects of health, incorporating a relational and supportive understanding of communication that addresses psychological aspects like emotions and stress (Kreps, 2023, p. 132). For many audiences, the persuasive elements of communication arise from feeling that the messages address their psychological concerns. Because "creative, appealing and acceptable approaches" that generate dialogue are "difficult and daunting" to achieve provaccine communication strategies must highlight these essential tasks (Gupta et al., 2021, p. 100).

False vaccine information is often highly effective because it deploys emotional appeals, especially anger and fear (Chou and Budenz, 2020). However, emotive aspects of communication are often left out of provaccine communication; for example, an study of Australian government provaccine communication found it almost completely relied on facts and needed to "invite emotional dialogue to be more successful, acknowledging and respecting the real fears of an audience who have doubts about the ability of the medical profession to help them" (McKinnon and Orthia, 2017, p. 13). Because human beings desire community and connection, pro-social emotional appeals that promote solidarity, altruism and an ethics of care toward others can enhance vaccine communication (Chou and Budenz, 2020; Ewuoso et al., 2022; Leuffen et al., 2023). However, different audiences

may perceive emotional cues differently, so vaccine communication strategies must "consider the emotional states of different audiences in targeted and tailored vaccine communication efforts," especially pro-social messaging to increase hope and joy (Chou and Budenz, 2020, p. 1720).

In countries with a consistently high distrust of government and its institutions, provaccine communication strategies must give more attention to building trust and solidarity by encouraging connection (Kieslich, 2018). Scientists, public health experts and governments must build "discourse coalitions" that emphasize "social norms and prosocial behavior" (Hong, 2023, p. 1), tailored to the worldviews, cultural, social, political and religious influences of scientists and their audiences (Lewandowsky et al., 2012; Seethaler et al., 2019; Avelino-Silva et al., 2023).

Communicating effectively involves evoking audience desire to connect to bolster solidarity and trusting relationships rooted in "transparency, participation, and justice" (Cooper et al., 2021, p. 921). In pandemic communication, ongoing community engagement is necessary to build trust and awareness (Hyland-Wood et al., 2021). For marginalized communities, trust-building requires empathetic, interpersonal and in-person interaction with trusted or relatable individuals, rather than just messages disseminated on social media (Hyland-Wood et al., 2021; Osman and Ogbunugafor, 2022). Trust is built when communicators connect to audiences by identifying "shared values" and enabling "communities and social networks to be involved in the decisions that will affect them" (Hyland-Wood et al., 2021, p. 3). Therefore, understanding audience desire for connection is at the core of effective provaccine communication.

Audiences

Audience groups have unique characteristics and communication campaigns should be adapted to suit particular audiences, including consideration for the communication tools and platforms they use, their beliefs, values and attitudes and appropriate images and languages (Kreps, 2023). When governments do not consider public opinions and needs, it can lead to audiences disengaging (Kim and Krishna, 2018). Therefore, a communication strategy should ideally outline the different audience groups and clarify what research will be undertaken to assess what types of communication will appeal to the relevant audiences. The strategy should outline why audience testing is essential, briefly discuss how messaging can backfire if not properly tested, how the views of the public will be gathered, what kind of testing is needed before a campaign is launched and how feedback should be incorporated into communication campaigns to ensure messages are understood and motivate people to act (Domigan et al., 2015; Xu et al., 2021).

For example, the strategy should outline whether social marketing will be used to assess the impact of communication on the audiences attitudes, behavior and beliefs (Chami, 2024) and/or whether the government will conduct social listening and infodemiology by scraping social media to identify specific strands of viral disinformation in circulation in different locales, the determinants leading to the spread of disinformation, the relationships between different strands and the impacts of disinformation (Hayawi et al., 2022). Further, the strategy should outline how information gathered will be used to tailor message to address the disinformation risks and local cultures (Lohiniva et al., 2022; Osman and Ogbunugafor, 2022; Pang et al., 2023).

Framing

Many science communication models focus on framing, and it is certainly a key element of science communication. In politics, framing is considered as a contest over meaning, with some meanings gaining more traction than others (Vliegenthart and van Zoonen, 2011). With regard to framing of provaccine messages, many interventions focus on the types of messages being disseminated, including, evidence-based communication, debunking, making audiences aware of disinformation (inoculation) (Whitehead et al., 2023, p. 1018), "inoculation messaging", and "truth sandwiches" (Kenix and Manickam, 2021) and "social marketing strategies".

Evidence-based communication typically centered on experts and the assumption of deficits in public understanding of vaccines (Rzymski et al., 2021). This approach has limitations because people do not automatically change their beliefs or behavior when presented with new facts; instead, belief change is an emotive process (Ruggeri et al., 2024). Therefore, effective vaccine communication strategies must "move beyond a naïve perspective that there is a direct connection between an evidence base and an optimal public health communication strategy" (Hyland-Wood et al., 2021, p. 2). Strategies that only focus on messaging limit the ability of governments to develop persuasive campaigns (Kim and Krishna, 2018). Vaccine communication needs to foster empowerment and generate feelings of togetherness to foster solidarity (Hyland-Wood et al., 2021). Simply debunking misinformation can backfire and lead some audiences becoming more convinced about the misinformation.

While inoculation messages do include evidence, the purpose is to prepare audiences for a threat by making audiences aware that there is a strong possibility of them receiving misinformation (pre-bunking) and they should be on the alert for this threat so that they are not misled (refutational pre-emption) (Compton et al., 2016; Osman and Ogbunugafor, 2022). However, this is not an exact science, so results vary depending on what is considered the optimal amount of threat to evoke, whether it is better to use one inoculation message or a variety, and the size of the time delay between inoculation messages and attack messages (Basol et al., 2021). With regard to vaccine communication, inoculation messages were shown not to have mitigated "the effects of trait reactance on vaccination willingness, and was even counterproductive in some cases" (Karlsson et al., 2024, p. 3450).

A "truth sandwich" is three part introduction to any written communication, as follows:

1 Start with the truth. The first frame gets the advantage.
2 Indicate the lie. Avoid amplifying the specific language if possible.
3 Return to the truth. Always repeat truths more than lies (Lakoff, 2018).

During the COVID-19 pandemic, truth sandwiches proved useful in limiting the spread of false vaccine information in a marginalized community (Knudsen et al., 2023) and the technique is now being promoted as a solution to false vaccine information (Lee and Bissell, 2024).

However, a systematic review of the literature on framing of vaccine messages found that framing did not significantly affect the intention of people to vaccinate (Penţa and Băban, 2018), which points to a need for a more holistic approach to communication that does not only concern itself with the message. As already discussed, relying solely on facts and evidence is insufficient to reach audiences and more affective approaches are needed, which consider audiences' fears and desires for safety; the next section discusses how aesthetics can be deployed to increase the persuasiveness of message and increase positive emotions to influence vaccine decision-making.

Aesthetics

Aesthetics are an oft-neglected component when discussing science communication models, yet aesthetics are essential in stirring up affects, that is, intensities, moods, the nonsensible, and emotions – the intangibles that help people feel connected to each other (Deleuze, 1978). Aesthetics are helpful in two ways: (a) they create the possibility of developing collectivities as people share enjoyment of aesthetic activities (e.g., visuals arts, music and dance) (Guattari, 1995); (b) where people might have rigid mindsets, aesthetics can shift our ways of seeing and allow us to imagine new possibilities (Deleuze and Guattari, 1994). It is important that communication strategies consider aesthetics because these "visceral dimensions of communication" go beyond words (Hyland-Wood et al., 2021, p. 6). Essentially, "humans are aesthetic creatures insofar as we negotiate and interact with this world through sensory perception and sensibility" (Saito, 2022, p. 12). Aesthetics engage with the psychological state of the audience leading to "affective commitment, positive affectivity, and empowerment" (Kim and Krishna, 2018, p. 217).

In particular, regarding medical communication, medical practitioners are expected to dispense psychological and emotional care alongside adequate scientifically-proven treatments. Aesthetics are a primary means through which the ethic of care can be conveyed, and thus an aesthetics of care can contribute to making society more humane and "social interactions more fulfilling" (Saito, 2022, p. 20). Vivid imagery, information embedded in meaningful narratives and personalisation can increase the appeal of the messages and boost audience attention, thus increasing the impact and influence of communication (Piotrowski et al., 2019; Kreps, 2023). Aesthetics can enhance and complement message transmission to configure audience emotions; for example, while evoking fear may lead to audiences seeking out less information about vaccines, evoking hope increases the likelihood of audiences seeking a positive information in the face of adversity (Volkman et al., 2023). Aesthetics create "more value and meaning, a greater sense of well-being, and more satisfying interactions" (Miller, 2013, p. 43). Aesthetics is the means through which communicators can express their creativity and inspire others. Deploying an aesthetic of care can help audiences understand that vaccine promotion arises from a desire to reduce suffering, and aesthetics can promote connection and solidarity such that people see vaccines as supporting society, not just individuals.

In Ghana, the aesthetic qualities of COVID-19 public health messaging "connected emotionally, created social awareness and improved public understanding," including comedy, cartoons, songs, murals and textile designs (De-Graft Aikins and Akoi-Jackson, 2020, p. 86). Further, African social media influencers lifted global audiences spirits during the pandemic, using humor, music and dance to connect with audiences (Machirori, 2023). However, insufficient attention has been given to researching and understanding the elements of effective

visual health communication in general, and even less on aesthetic approaches to visual communication during pandemics (King and Lazard, 2020).

Communication tools

Other than framing, communication strategies often conflate identifying dissemination tools with strategy. For example, in Ghana, the main COVID-19 communication "strategies" were identified as "Presidential Addresses, Minister's Press Briefings, designated COVID-19 Website, and Social and Traditional Media to communicate to its citizens" (Antwi-Boasiako and Nyarkoh, 2021, p. 1175), while in the case of Nigeria's Plateau State, "strategies" were identified as "digital media campaigns, community outreach programs, and promotion efforts" (Kakwi et al., 2024, p. 1). A heavy focus on tools assumes that communication tools such as information and communication technologies are the main determinants of development outcomes – a technocratic approach that has been widely critiqued (Schelenz and Pawelec, 2022). Further it assumes that effective communication is mainly rooted in achieving a wide reach, even though audience reach tells us little about "what audiences actually saw or heard, or what they thought and did as a result" (Macnamara, 2022, p. 2247).

Nevertheless, effective communication strategies should consider a wide range of dissemination tools, but specifically, need to consider the most effective tools for building equitable relationships with audiences using a dialogical approach that is responsive to audience feedback (Kim and Krishna, 2018). In the case of South Africa, only 4.3 million of the 17.8 million households have stable internet access (TMO Contributor, 2025), so government needs to consider how vaccine communication will reach those with limited access to online messaging. Further, the mainstream media is still highly racialised, appealing to white audiences and not appealing to the broader population or addressing exclusion (Govenden and Chiumbu, 2020). While much of the literature focusses on social media and digital tools (inter alia text, memes, photographs, vlogs) and mainstream media, communication strategies need to consider other tools such as pamphlets and posters, including with infographics, and community engagement at events (workshops, conferences, meetings). Attention should also be given to music, film, drama, visual arts, and the use of humor. Different communication tools provide different possibilities and can draw on different aesthetics to achieve affective connection with audiences.

Methodology

The study applied a close reading and content analysis to the World Health Organization (WHO) *COVID-19 vaccines: Safety surveillance manual: COVID-19 vaccine safety communication* (WHO, 2020) and the South African guidelines published on 26 January 2021 by the National Department of Health: *A COVID-19 Vaccine rollout communication strategy: Mapping the road ahead* (NDoH, 2021). A close reading was necessary to identify what elements of communication are covered in the strategies, the depth in which the elements are covered and the meaning of the text, and to analyze whether the information provided is sufficient to give those designing provaccine communication campaigns insight into all aspects of the approach chosen by government. In particular, the study aimed to identify whether the strategy documents covered all

TABLE 1 Definition of themes for close reading and analysis.

Theme	Definition and keywords
Power	Any text discussing the power of different stakeholders Any text discussing how audiences can be empowered to act
Audience	Any text acknowledging that audiences have different needs Any text discussing how to assess audience needs, values and cultured, including social market analysis, social listening, monitoring, or infodemiological approaches Any text discussing how to incorporate audience needs, values and culture into messaging
Desire	Any text acknowledging the need to address audience psychology, especially: (i) Negative feelings and attitudes, such as fear or anxiety, that may inhibit vaccine uptake. (ii) Positive feelings and attitudes, such as trust and confidence, that might motivate audiences to vaccinate. Any text explaining how to incorporate an understanding of audience psychology into communications campaigns
Framing	Loosely defined in this study, encompassing any reference to specific messages or message strategies.
Aesthetics	Any text referring to how design will be used to achieve emotional resonance, including discussion of the types of imagery, narrative and storytelling, music, dramatic effect, humor, and so on.
Tools	Any text discussing how best to achieve high audience reach Any text discussing how to achieve dialogue with the public Any text identifying specific dissemination tools such as the mainstream media, social media, materials such as posters and pamphlets, engagement events, and spokespersons and influencers.
0	Any text which did not fit into the above categories.

the key elements of effective science communication including those covered in the literature and those identified in Figure 1 and then analyzed how/if the strategies reveal how the elements work together to result in powerful, persuasive provaccine communication. The texts were classified into themes aligned with the conceptual framework, as defined in Table 1.

The texts of each strategy document were broken into logical pieces, based on the structure of the document; sometimes whole sections focussed on one issue but sometimes only a sentence or sentence part addressed an issue, hence the text was cut up in the order presented and divided along thematic lines. For each strategy document, each piece of text was then pasted into an Excel spreadsheet and coded based on the theme reflected in the text.

As only one researcher was working on the project, it was not possible to crosscheck the coding, however, to deal with this limitation, the coding was then double-checked by identifying keywords in the text, which led to reclassifying some coded text, albeit most codes remained the same. Once the crosscheck using keywords was complete, the spreadsheet was sorted by themes and totals of themes for each strategy document were collated. The keywords supported the analysis by highlighting the main elements given consideration under each theme.

A limitation of this study is that it only evaluates two strategy documents, however, the study was not intended to highlight these strategies as definitive, but rather to highlight the strengths and

weaknesses of such documents so that any gaps can be considered for inclusion in any future strategy documents.

Results

The results of coding are provided in Supplementary material the initial coding for the WHO document is presented in the Excel sheet entitled "WHO initial coding" and the confirmation coding with keywords is presented in the Excel sheet entitled "WHO themes keywords"; and the initial coding for the South African data is in the Excel sheet entitled "RSA initial coding" and the confirmation coding with keywords is presented in the Excel sheet entitled "RSA themes keywords."

Below we provide a brief description of each document, and we then unpack how each document tackles the themes in Figure 1 and Table 1.

WHO publication on COVID-19 vaccine safety communication

The WHO strategy document mainly focussed on tools, audience monitoring and frames (see Figure 2). Figure 2 shows 24 texts that did not fit any of the themes; these were typically either general remarks about the purpose of a communications strategy or they were hypothetical examples of communication issues; these did not detract from the overall thrust of the analysis.

The World Health Organization's *COVID-19 vaccines: Safety surveillance manual: COVID-19 vaccine safety communication* (WHO, 2020) appears to be the only document produced by WHO to inform governments how to undertake COVID-19 vaccine communication. The handbook does not spell out who the handbook is directed at but does say that it aims at a "programme perspective," so we can conclude it is targeted at high-level officials involved in rolling out COVID-19 vaccine communication campaigns. The manual is 48 pages including appendices, and consists entirely of text, tables, and bullet lists with no

illustrations or figures or check lists. The layout of the handbook is basic, with very little variation from one page to the next. The text is black on a white background, with headings in brown, as shown in a page sample in Figure 3.

The handbook starts with an overview of vaccine hesitancy, followed by an outline of key steps in planning vaccine communication rollout, then some hypothetical scenarios, and more details presented in appendices. Although the information provided is clear and concisely written and covers many of the topics in the literature review, such as consideration of dissemination tools, different audiences, evidence-based communication, trust building, social listening, and cultural differences, it is not engaging. It reads as a list of instructions on the steps to be taken, rather than inviting the reader to think through, discuss and interpret these instructions. Further, the instruction steps do not have sufficient detail to specify how to complete those steps, and do not clearly explain how the different elements of the campaign work together, for example, how audience listening should shape the communications campaigns.

With regards to the model proposed in Figure 1, specific gaps were identified below.

Power

Of all the thematic areas covered in the handbook, power receives the least attention, even though power dynamics are strongly involved in message reception (Canfield et al., 2020). Six pieces of text are associated with power in the WHO handbook, related to the keywords: empowerment, social context, political context, historical context, marginalized groups, negative experiences, and political influence. As such, the handbook acknowledges that vaccine communication should "empower" people (WHO, 2020, pp. iv; 7) and that social, political and historical contexts, and previous negative experiences with the health system may influence trust in vaccines, especially for marginalized groups (WHO, 2020). However, it goes on to argue that the "politicization of vaccination programs is likely to do more harm than good" (WHO, 2020, p. 6), thus implying that that ignoring the power dynamics will be beneficial. In line with this, the
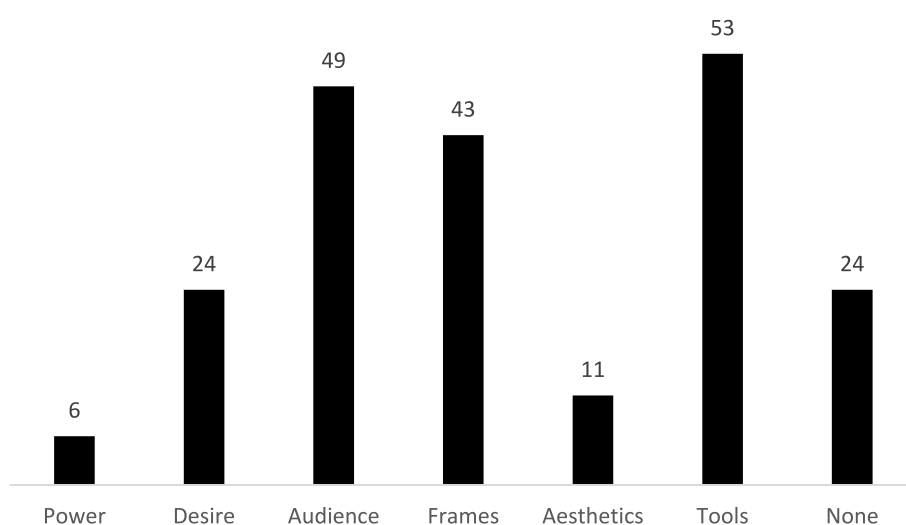

FIGURE 2
Prevalence of themes in WHO strategy.

3.5 Communicate in ways that build understanding and trust

Communication that is transparent, timely, empathic and acknowledges uncertainty can help boost people's trust in health authorities, which in turn can positively influence people's willingness to be vaccinated.[39] These principles should be used to guide how, when, and with whom to communicate.

Communicate with openness and transparency: Be open and transparent about vaccine safety by providing access to all information, not withholding any, even when the facts are yet to be fully established.[29] There is no evidence to support the assumption that the public will panic if they have access to accurate information in a crisis.[40] Lack of honesty and withholding information can erode trust. Keep promises to share information and regularly update the public with new information. If specific information about vaccine safety is unavailable, communicators should say so and explain how they plan to get it. When it is not possible to share specific information about an on-going investigation, share information about the process and what is expected to take place. When details are scarce, communicating hope is appropriate.

Communicate with clarity: This includes demystifying vaccine safety for the public. For example, explaining how vaccines are tested and then monitored for safety. It is important to pay attention to health literacy when developing statements and materials.[41] This is particularly important when considering equity of access to information. Plain language communication includes being clear about what people need to do in relation to vaccine safety, getting to the point quickly, and understanding audience information needs.[42] Differing levels of numeracy should be accommodated when communicating probabilities, by communicating both qualitative (e.g., very low) and quantitative (e.g., 1 in every 100,000 people receiving the vaccine) estimates of risk.[43] See **Appendix 5.6** for further information.

Accept and acknowledge uncertainty: Convey uncertainty about vaccine safety, when it exists, in a way that avoids over- or under-confidence and will ensure informed decision making. Being over-confident, over-reassuring or minimising risks may reduce trust. On the other hand, evidence suggests that the communication of uncertainty about pandemic vaccines can reduce vaccine intentions.[44] Identify likely scenarios the public may need to consider

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COVID-19 VACCINE SAFETY COMMUNICATION   11

FIGURE 3
Sample of page layout of WHO COVID-19 vaccine safety communication handbook.

word "power" only appears in the handbook once, and this in relation to the power of the anti-vaccine community – in Appendix 5.2, as follows [emphasis in original]:

> Do not refer to activists using imprecise collective nouns, i.e., the anti-vaccine community or anti-COVID-19 vaccine groups. This can imply they are larger and more organized than they really are, may confer them more perceived power and influence, and get them more followers (WHO, 2020, p. 26).

Because it does not explicitly discuss social, political and historical contexts in terms of power dynamics, it does not equip communicators to understand the powerful forces shaping audience perceptions. Instead of discussing power, the handbook focuses on equity, without acknowledging that equity is about power relations. For example:

> Lack of equity in health authorities' responses to the COVID-19 pandemic, or in previous immunization situations, could affect trust in COVID-19 vaccines among some historically disenfranchised groups (WHO, 2020, p. 5).

While it is important that the handbook does mention the power of those spreading false information, without a thorough discussion of how power dynamics impact on who is listened to and who is silenced, vaccine communicators will not be equipped to ensure that audiences are empowered to make decisions in favor of vaccination (Ogugua et al., 2024), nor will they be equipped to think through how to use communication to powerfully persuade audiences. While it is important not to politicize vaccine campaigns and to focus on human well-being, it cannot be ignored that others are politicizing the issue, and therefore, develop campaigns that counter such politicization.

Desire

Texts associated with desire occur 24 times in the WHO handbook, related to the keywords: confidence, trust, safety perceptions, shared values and beliefs, moral foundations, empathy, emotion, compassion, anxiety, fear, and positive emotions. It especially emphasizes the importance of building trust and confidence to improve perceptions of safety, and briefly mentions that empathetic and compassionate communication help develop these positive emotions. But it does not get to the heart of the values and emotions driving decision-making, nor does it speak to the kind of world audiences desire to live in and how vaccines contribute to that imagined world.

When considering the emotional responses, the handbook does mention the importance of triggering "positive emotions" (WHO, 2020, p. 26) but mostly focuses on interpersonal communication and rapid response to any safety concerns. It does not specify how empathy and compassion can be incorporated in, for example, mainstream media, social media, or materials produced (such as posters and pamphlets). Specifically, it does not highlight how using culturally resonant campaigns that address peoples' cultural values and beliefs can boost connection between people and enhance solidarity. While it recognizes the need to overcome "language, cultural and literacy barriers" (WHO, 2020, p. 39) it does not discuss the challenges for multicultural societies and how this varies across population groups

(e.g., age and gender), or how culture is expressed through the arts, such as music, humor and visual art.

While the WHO handbook does exhibit an understanding of the role of emotion in driving vaccine uptake, it does not strongly indicate how these can be incorporated into campaigns. Specifically, to be effective, communication campaigns the understanding of emotions needs to shape messaging and the chosen aesthetics to elicit positive emotions in favor of vaccination. It is important the strategy documents make specific links between the elements, to show how they work together, like cogs in a machine, to generate powerful, persuasive communication.

Audiences

A strong feature of the handbook is that 49 pieces of text discuss audiences, with keywords being related to (i) audience segments; (ii) research methods (formative research, focus groups, interviews, monitoring, listening, surveillance, tracking, social media analytics; content analysis, message reach); (iii) the purpose of research for understanding audience concerns, audience intentions, audience needs, audience perceptions, identifying threats, attitudes and beliefs, cultural and religious influences, individual knowledge; and (iv) messaging related to audience segmentation and responses (decision tool, pre-testing, tailored messaging, targeted messages, management, and response strategy). While these are all key components for campaign development, the strategy document does not explicitly explain how these four aspects of audience understanding feed into campaign development.

It does discuss when to ignore negative messaging (to not draw attention to it) and how to scale campaign responses in response to negative messaging, but it is unclear from the handbook how understanding of audience flows into the other aspects of communication campaigns. For example, it does not explicitly explain that different audience segments may have different needs and attitudes, and that this would influence the choice of messaging, aesthetics and dissemination tools. It also does not explain how awareness of audiences can contribute to empowering the audience or strengthening their desire for connection, to build solidarity. Therefore, the handbook should be strengthened by making explicit links between the audience topics discussed, including arranging them in a logical order, and the other elements of communication (power desire, framing, aesthetics, and tools).

Framing

The WHO handbook strongly emphasizes the importance of appropriate messages (framing) with 43 text segments focussed on this topic, covering keywords covering (i) the approach to positive communication (evidenced-based approach, scientific consensus, facts, transparency, accuracy, credibility, clarity, standardization, consistency, responsive, safety, recommended action, considered approach, reduce uncertainty, acknowledge uncertainty, reputable sources, technical understanding, data presentation); and (ii) problematic messaging (negative messages, misinformation, disinformation, conspiracy theories, fake news, negative claims, flawed arguments, myths, and naming perpetrators spreading false information).

However, framing is an explicitly political processes, whereby some messages in society are more salient than others, depending on the power those sharing messages (Pan and Kosicki, 2001; Carragee

and Roefs, 2004). Since the handbook does not consider power and desire, it provides little insight into how to frame messages in ways that address the power dynamics and audience desires. It further suggests that communicators should not try to argue with or convince anyone spreading negative messages but should rather emphasize facts.

With respect to appropriate messaging, the main focus of the handbook is on an evidence-based approach, even though, as discussed above, focusing solely on evidence does not automatically change minds and the using the deficit model to engage audiences "is a barrier to engaging in relational strategies to correct misinformation" (Choi et al., 2023). The proposed messaging also does not give attention to inoculation theory or "truth sandwiches," even though these have been shown to support provaccine communication.

When tackling framing, the handbook emphasizes building trust by using plain language, being open and transparent about unknowns and uncertainty, demystifying testing and safety processes, accommodating for differing numeracy levels among audiences, and using empathy. The handbook also provides examples of different hypothetical scenarios and the messaging to use to address them. As such, the handbook strongly makes a link between audience desires (emotions) and the appropriate wording of messages.

However, the handbook does not discuss what kinds of messages are empowering and can be used to address the politicization of vaccine communication. It also does not provide any links between the messages and aesthetics chosen for conveying the message, nor how different types of messages may be appropriate to different message platforms (tools). Hence, the handbook should improve its explanation of the links between messaging and other aspects of communication.

Aesthetics

Although aesthetics are highly effective and influential in reaching audiences, enhancing collectivity, and changing perceptions of the world, this topic only receives attentions in 11 texts in the WHO handbook. The specific aesthetic keywords are: competence, empathy, tone, narrative, trust, authentic, personal, positive stories, and emotive narratives, that avoid hostility. However, it does suggest how these can be conveyed through design and aesthetic choices, such as dance, music, drama, or poetry. Further, it only mention the importance of visual communication once in the Appendix, as follows:

> Use illustrations and visuals. Visuals can clarify text and data, but they should be closely related to what is said in the text, to be effective. Using visuals on their own can make messages accessible by overcoming language, cultural and literacy barriers (WHO, 2020, p. 39).

This short sentence does not reflect on the importance of creativity in reaching audiences and inspiring change. This gaping hole in the communication strategy suggests that provaccine communicators are not giving sufficient attention to the powerful impact of aesthetics, and therefore not giving enough attention to elements of persuasion.

By ignoring aesthetics and making no link between aesthetics, and power, desire, audience reception, framing, and chosen dissemination tools, the handbook is leaving out a key aspect of effective, powerful, persuasive communication. The handbook treats aesthetics as a non-issue, even though aesthetics are the most significant factor in

determining an audience's affective state, inducing positive affect, and empowering action (Kim and Krishna, 2018). Any effective communication strategy must include aesthetic considerations.

Tools

The WHO strategy places strong emphasis on the choice of tools in the communication strategy, with 53 sections of text focussed on this theme, covering the keywords: (i) relationship-building (partnerships, relationships, networks, lines of communication, training), (ii) people (spokespeople, advocates, trusted sources, authorities, experts, healthcare workers, trained stakeholders, leaders, journalists, influencers, knowledgeable people, respected voices, ambassadors, educational institutions), (iii) trusted channels and platforms (media, social media, websites/online), (iv) other materials (brochures, handouts, glossary of terms, materials for healthcare workers, hotlines, emails, two-way communication, interpersonal communication), and (v) activities and events (such as public forums).

Importantly, with respect to social media engagement, the strategy emphasizes the importance of committing "to two-way communication" and dialogue, including interacting, replying and conversing," answering questions and addressing concerns using "an authentic, personal approach" to "create safe spaces" (WHO, 2020, p. 15). The handbook also emphasizes the importance of "creating multiple forums for the public to ask questions or raise concerns, such as public meetings, website feedback forms, email, telephone hotlines, online chat, or a social media platform" (WHO, 2020, p. 8). Therefore, the handbook places strong emphasis on dialogue, and the tone used in dialogue, for powerful, persuasive communication.

However, the handbook could do more to link the chosen tools, channels and platforms to aesthetic and framing considerations. Ideally, the communication strategy should make clear the basis for choosing particular tools. For example, it could illustrate which tools are most appropriate for long form messages, storytelling, and narratives, and which are best suited to artistic approaches, such as social media, television, film and music. In terms of empowerment, it should also make clear which tools have the best reach and why, and which allow for more direct engagement. The handbook should also make clear how the choice of tools relates to audience desires, in terms of which tools audiences prefer and enjoy the most.

SA COVID-19 vaccine rollout communication strategy

The South African strategy document mainly focussed on tools, frames, followed by audience monitoring (see Figure 4). All of the text covered the relevant themes desire, audience, frames, aesthetics and tools, but none covered power, and none of the text were classified as unrelated to the themes. Desire and aesthetics also received little attention.

The SA COVID-19 Vaccine Rollout Communication Strategy is a 22-page document developed by the Risk Communication and Community Engagement Technical Working Group (RCCE), a "collaboration of Government, civil society and development partners – under the leadership of the Director General for Health and the Incidence Management Team" and particularly aims to address expected "science denialism, anti-vax sentiments and vaccine hesitancy in South Africa" due to "that can arise from misapprehensions around
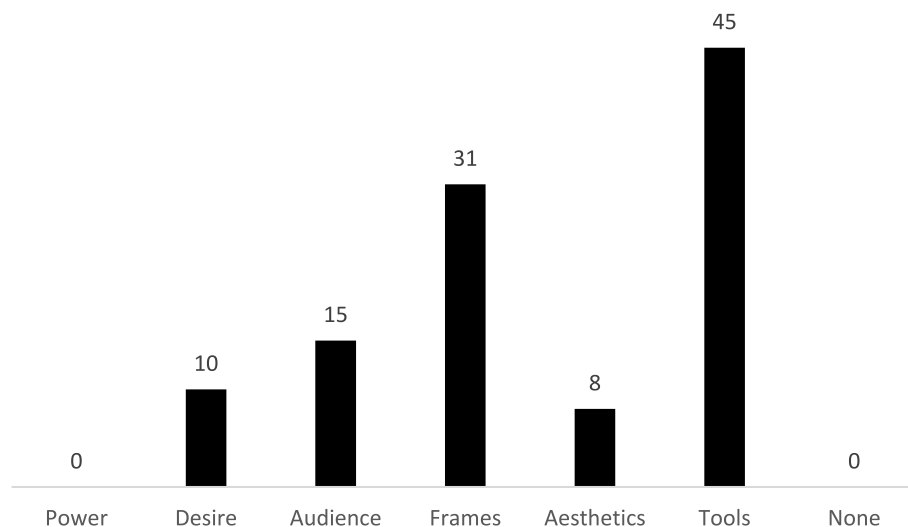
FIGURE 4
Prevalence of themes in South African strategy.

vaccine safety and efficacy, as well as rumors, myths, conspiracies, and misconceptions" (NDoH, 2021, pp. 2–3). It is directed at all South Africans, but with specific mentions of journalists, community leaders, and people with influence, who are charged with communicating accurate information to the public.

The document has very basic layout, with most pages consisting of headings, short paragraphs, and bullet lists (see Figure 5). The document does not attempt to draw in the reader through images and illustrations and appears not to have been through any design process to make the strategy document more approachable.

The main focus of the document is "contextualizing Risk Communication and Community Engagement (RCCE) strategies," "ensuring stakeholders' involvement," "defining steps to be taken in case of any adverse effects following immunization," and "building an effective monitoring and reporting system" (NDoH, 2021, p. 4). The document acknowledges the need for communicators to be trained, especially helpline staff, frontline workers, government communication staff and social media managers, and indicates it will require support from various non-governmental organizations to develop appropriate capacity building materials and conduct capacity building training events. However, the strategy almost entirely consists of bulleted lists of tasks, which is tiring to read, with information being difficult to absorb.

The proposed strategy is top-down, with a National Media Rapid Response Team (RRT) monitoring and tracking vaccine conversations and developing messages in response to "the pulse of discussion" (NDoH, 2021, p. 12).

Power

It is deeply concerning that the strategy does not include any mentions of power or empowering audiences, especially given that South Africa has many marginalized groups that require specific attention in vaccine communication campaigns (Cooper et al., 2021). Since this strategy does not give attention to power and empowerment, it is not well-suited to developing empowering, persuasive communication campaigns.

Desire

The South African handbook includes 10 text parts that relate to desire, with keywords focussed on confidence, trust, and solidarity, alleviating apprehensions, and addressing the slow process of vaccine rollout in the face of eagerness to get vaccinated and disappointment for having to wait for vaccines. However, apart from delegating the responsibility to government workers, experts, and healthcare workers, none of the texts explicitly explains how positive emotions will be evoked and negative emotions allayed in communication campaigns. The main recommendation for building trust is being transparent and providing a rapid response to any false information being spread. But the strategy does not consider the relationship between different audience segments, framing, aesthetics, and tools. The strategy could therefore benefit from making more explicit links between the different elements of communication and how these will be incorporated into vaccine campaigns, not left solely up to individuals to address alone.

Audiences

Although the foreword to the strategy emphasizes that it is people-centered, audience approaches are only given sparse attention (15 text sections), focussed on the keywords related to (i) audience segments; and (ii) research to be undertaken by the national media response team (monitoring, listening, tracking, analytics, focus groups, engagement).

With respect to audience segments, the strategy merely provides lists of who will be targeted, i.e., parliamentarians and councilors; the Ministry of Health and National Health Council; professional medical bodies, doctors and health workers, alternate medicine practitioners and public health partners; national and local media representatives; public and private sector companies; development partners; civil society; Community Based Organizations and Community Health Workers; religious/faith-based leaders; traditional leaders; and organized labour (NDoH, 2021). Strong emphasis is placed on community groups and the strategy indicates that government district departments and provincial governments should generate lists of appropriate groups to be involved.

To achieve a wide reach for the messages and in order to get a greater degree of engagement from all target audiences, a wide variety of trusted sources and communication channels and platforms will be leveraged in both urban and rural areas. Each platform will have specific communication tools and materials for activation, mobilisation and broadcast.

5.1 Key Components of the Advocacy Strategy

Advocacy efforts will aim to engage the maximum number of people by promoting the benefits of COVID-19 vaccines and support building an enabling environment. Various stakeholders and experts will lead the advocacy campaigns at national, provincial and district level. These include (but are not limited to):
– Parliamentarians and Councillors
– Ministry of Health and National Health Council
– Professional medical bodies, doctors and health workers, alternate medicine practitioners and public health partners
– National and local media representatives
– Public and private sector companies
– Development partners, Civil Society
– Community Based Organisations, Community Health Workers
– Religious/faith-based leaders, traditional leaders (Contralesa)
– Organised Labour

Activities include:
– Leveraging national and state-owned media agencies for organising advocacy activities
– Negotiating discounted and pro-bona time with commercial channels
– Publishing opinion pieces, organising interviews and discussions with scientists, experts and other credible voices
– Telling stories of ordinary people who can serve as influencers in their communities
– Implementing Standard Operating Procedures (SOPs) for Adverse events management, spokespersons' training, preparedness, rumour management, planning for press releases and conferences

5.1.1 Key Actions at National Level

At the national level, the following advocacy actions will be implemented:
– Research into non-adherence to safe behaviour & vaccine hesitancy
– Development of an advocacy package: FAQs, leaflets, factsheet, multimedia material, developed in several SA languages
– Adequate preparation for the launch of the vaccine, by holding pre-launch sensitisation events with journalists; develop media kits
– Organising inter-ministerial meeting / briefing on the COVID-19 Vaccine
– Communication Strategy and vaccination process to ensure that all political and bureaucratic leadership is reinforcing the same messaging
– Sharing communication materials and messages for efficient use of platforms owned by the influential voices mentioned above
– Leveraging national and state-owned media agencies for organising advocacy activities
– Publishing opinion pieces, organising interviews and discussions with scientists, experts and other credible voices
– Implement Standard Operating Procedures (SOPs) for adverse events management, preparedness, rumour and fake news management, planning for press releases and media briefings
– Consistent, simple and timely communication & updates on developments to do with the vaccine
– Produce a list of words (lexicon) in all 11 SA languages to make it easier to communicate facts on COVID 19 and vaccines. Words include epidemiology, virus, immune system, exponential, population immunity, vaccine.

Page **9** of **22**

FIGURE 5
Sample of page layout of SA COVID-19 vaccine rollout communication strategy.

With respect to audience research, the document emphasizes that this should lead to more effective decision-making, guide social media campaigns, help "identify clear opportunities for intervention" (NDoH, 2021, p. 3), and support "proactive engagement" and rapid response (NDoH, 2021, p. 12). However, the main focus of the research is identifying and curbing the spread of false information, rather than identifying audience attitudes, responses and emotions, to identify how to connect with audience desires. The strategy could

therefore benefit from paying more attention to exploring the emotive aspects of audience response, to for example, specific frame and aesthetic decisions. Further, the strategy needs to make more explicit how audience engagement and dialogue will take place, how to bolster the spread of messages, and how to link the audience research to the specific tools chosen for dissemination.

Framing

While framing is a key topic of the strategy document, covering 31 text segments, most of this is simply listing possible messages, and does not specify a framing strategy (such as inoculation theory or "truth sandwiches") or how to make messaging empowering. The keywords associated with framing are: (i) general principles of messaging (accuracy, transparency, evidence-based, scientific, clarity, information, factual, correct, consistent, simple, responding to fake news); (ii) specific content about vaccines (safety, efficacy, protection, addressing myths, misinformation and fears); (iii) specific content about acquisition of vaccines (costs, pricing, licensing, purchasing, procurement, distribution, financing/funding, supply issues); and (iv) programmatic concerns (non-pharmaceutical measures, best opportunity, phased rollout, registration, procedures, venues, national helpline numbers).

Annexure 1 of the strategy document contains four pages of lists of proposed messages in bullet form, such as those in Figure 6.

The main gist of the messages is that the vaccine is safe, and that people should be patient in waiting to have vaccine access, alongside many messages explaining how government is going about acquiring vaccines. The main focus of the messaging strategy is that content should be clear and simple, "debunking myths" and "correcting any factually incorrect information" (NDoH, 2021, p. 13), based on an evidence-based approach.

None of the texts around framing discuss how to address audiences' desires and emotional responses, for example, none of the messages emphasize care or compassion as drivers of the vaccine rollout or that getting vaccinated shows care and solidarity for others. Further the framing approach is not linked to the research emerging from audience research, suggesting that messages have already been decided, without pre-testing and without paying attention to audience segments. The strategy also does not explain how aesthetics can be used to bolster the persuasiveness of the message, nor that the type of message should influence the choice of dissemination tools (for example, that different types of messages are appropriate to different platforms). As such, the strategy could be strengthened by better defining a framing strategy that goes beyond just evidence-based communication (for example, incorporating inoculation theory and linking to other elements of communication) rather than just listing many pre-prepared messages.

Aesthetics

The South African strategy document pays almost no attention to aesthetics as a key element of vaccine communication, covering this topic is only 8 text segments, with the following keywords related to (i) the quality of communication (positive, creative, attractive, pride), (ii) modes of communication (human interest stories, stories and testimonies, success stories), and (iii) design. While the strategy mentions that communication should be "creative" and "attractive" (NDoH, 2021, p. 13), it does not elaborate further on aesthetic or design elements, such as being culturally relevant. It also does not link aesthetics to audience research and discuss how to make communication resonate with different audiences (for example, how to appeal to different age groups, genders, or ethnic groups). Further, the strategy does not consider the different aesthetic affordances of different communication tools, for example, the written word, static or moving images, music, and so on.

To be effective, vaccine communication strategies must give much more weight to aesthetics as the primary way to build emotional resonance and persuade audiences. Further, strategies must link aesthetic concerns to other elements of communication, including considering audience empowerment, desire, audiences' aesthetic preferences, contribution to framing, and selected tools.

Tools

Given that the bulk of the South African strategy document focusses on tools (45 text segments), it seems that strategy is being greatly conflated with tool selection. Further, despite listing many tools, the strategy contains little discussion about how to strategically choose the appropriate tools for specific campaigns. For example, it does not discuss which platforms are the most powerful, have the greatest audience reach, how the type of message relates to tool choice

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Annexure 1: KEY MESSAGES

Proposed Key Messages on COVID-19 VACCINE ROLLOUT
- COVID-19 Vaccine is safe and effective and will be available in a phased manner.
- COVID-19 Vaccine along with Non-pharmaceutical preventative measures are effective to protect individuals from COVID-19 infection.
- COVID-19 preventative measures are to be strictly followed at all time, even after vaccination.
- Pre-registration is a must for the eligible beneficiaries (to be verified by Vaccine MAC).
- Vaccine will not be given to the individuals who are not registered (to be verified by Vaccine MAC).
- If you are unwell when at the time of your second dose of vaccine appointment, it is better to wait until you have recovered. You should try to get the second dose as soon as possible after recovery.
- You should not attend a vaccination appointment if you are self-isolating, or waiting for a COVID-19 test or unsure if you are not well.
- Complete schedule of vaccination will reduce chances of a person becoming seriously ill.

FIGURE 6
Key messages outlined in strategy document (NDoH, 2021, p. 18).

(for example, longer written messages vs. short, snappy messages, platforms focussed on dissemination and platforms allowing for dialogue) or how the chosen tool influences the aesthetic outcomes. The strategy also does not emphasize the importance of using tools for dialogue, rather than simply broadcasting messages.

Based on the keywords, the only strategic elements discussed are training, capacity-building and sensitisation of spokespersons, and a media rapid response team to deal with adverse events crisis communication. Most of the keywords focus on (i) partnerships with different spokespeople (healthcare workers, stakeholders, influencers, celebrities, local leaders, frontline workers, government employees, scientists, experts, journalists, officials, public figures, advocacy groups); (ii) different platforms (social media, mainstream media, commercial channels, digital media, toolkits, content packs, training materials, storytelling, articles, opinion pieces, editorial partnerships, briefings, advocacy, outdoor media, leaflets, factsheets, multimedia in many languages, keywords in different languages, communication materials, advocacy events, written appeals, audio/video clips, community radio, interviews, interview pitches, FAQs, explainers, press notes, GIFS, repository, central mailbox for stakeholders and ministers, official branding); and (iii) events (community consultations, local and district events, advocacy events).

With respect to social media, the strategy indicates that a separate social media plan will be developed but that provinces should use their existing social media platforms to engage audiences as these have already established trust. The plan also indicates social media influencers should be engaged to support in sharing the messages developed by government. WhatsApp is highlighted as a key digital platform for disseminating messages, and the strategy proposes developing a specific content package for this platform. For community and commercial media, the strategy focusses on using existing media agencies to organize activities, while ask commercial channels for discounted provision of space. The strategy notes the need for regular media briefings and indicates that medical professionals and scientists should be encouraged to write opinion pieces. A proactive approach is recommended, especially when adverse events occur, with the pre-selection of experts who can address such events.

To strengthen the strategy document, rather than providing longlists of different tools, discussion is needed on how to make strategic selections of the tools, how to determine which tools will have the most impact for specific audience segments, and how the chosen messages and aesthetics feed into tool selection.

Discussion

While the WHO strategy document shows evidence that some of the latest developments in science communication and provaccine communication have been considered, it still does not do enough to inspire creativity to develop powerful, persuasive provaccine communication. Rather than engaging the reader, the document reads as a long list of elements to consider – and these are not considered in sufficient detail to be useful. The over-emphasis on tool choice suggests a flawed technocratic approach to communication, that incorrectly equates audience reach with impact (Macnamara, 2022; Schelenz and Pawelec, 2022). This over-emphasis on tools is somewhat ameliorated by a strong emphasis on audience research and

pre-testing, but the handbook is still flawed because it provides little guidance on how audience research should flow into other aspects of communication design (such as addressing audiences empowerment, audience desire, adapting messages and aesthetics in line with research, and selecting tools based on audience segmentation). Further, while the strategy places strong emphasis on the wording of messages, it barely discusses framing strategies (including ignoring inoculation theory and "truth sandwiches"). Readers are thus not equipped to think strategically about framing but only given examples to adopt. The low consideration of desire and power also limits the possibility of using the strategy to develop communication campaigns, as both elements should be a top consideration when considering how to empower, influence and persuade audiences. While the document includes mentions of audience emotions, barely considering aesthetics as a means to influence audiences' affective state means that readers are not equipped with a good understanding of how to make an emotional connection with audiences, for example, by using cultural aesthetics to build solidarity – a key to effective vaccine communication.

The South African government strategy is even weaker, as it shows no grasp of science of science communication and provaccine communication. It is mostly pages worth of bullet lists, void of analysis or communication theory. Especially egregious is the total absence of a discussion of power, even though South Africa is characterized by many marginalized people with little access to power. Since power is not discussed at all, the reader is not equipped to understand how provaccine communication can be used to empower people to choose vaccination. Further, while the strategy mentions elements of desire, such as confidence, trust, and solidarity, and alleviating apprehensions it provides little guidance on how to boost these with appropriate framing, aesthetics and tool-selection. Instead, like the WHO strategy, it over-emphasizes tool selection, suggesting technocratic thinking that equates reach with impact (Macnamara, 2022; Schelenz and Pawelec, 2022). Also, while the strategy document recognizes audience research and audience segmentation as relevant to a communications strategy, it does not indicate how these flow into strategic thinking, including how they should influence decision-making on framing, aesthetics and tools. Further, even though framing receives much attention in the document, instead of indicating that framing must be strategic and discussing framing strategy, the document merely provides long lists of sample messages, with no indication of whether they have been pre-tested. Hence, the strategy document does guide strategic framing but simply lists messages. Similarly, the low relevance given to aesthetics in the strategy means that the strategy document mostly ignores a key component of powerful, persuasive provaccine communication.

Fundamentally, neither strategy document sufficiently acknowledges that vaccine communication is highly politicized, so do not equip communicators with the communication skills and tools for empowering audiences. Further, while they consider audiences (including their desires), emphasizing the role of research, the approach taken in the strategy documents does clearly guide the incorporation of audience research and desires into strategic framing, aesthetics and tool use. Similarly, the emphasis on framing falls short because it leaves out framing strategy, instead providing lists of possible message wording, without indicating the need for pre-test these messages. Since both documents neglect aesthetics, readers are not sufficiently equipped to understand how aesthetics – including cultural elements, can help promote positive emotions or boost and

consolidate solidarity. Aesthetic considerations should not be an afterthought in provaccine communication strategies as they are fundamental to how communication is perceived and experienced.

Conclusion

While one would hope that strategy documents would inspire the development of novel and appealing provaccine communication outputs, unfortunately, the documents analyzed have too many gaps to properly illustrate all elements of provaccine communication campaigns. To improve strategic thinking, government agencies need to pay attention to all elements of communication (power, desire, audiences, framing, aesthetics and tools). Further, strategic thinking means highlighting how all the elements relate to each other and contribute to the overall flow of developing appropriate provaccine communication strategies. The machine-assemblage model provided Figure 1 can be deployed in generating future provaccine strategy documents, because it illustrates the connection between the elements and the necessity for the elements to be aligned coherently for effective, powerful and persuasive provaccine communication. Therefore, it is recommended that the model be widely deployed and considered in provaccine communication strategies.

Data availability statement

Publicly available documents were analyzed in this study but the WHO and South African NDoH have since removed the documents from their websites. Please contact the author if you would like a copy of the documents.

Author contributions

RP: Formal analysis, Validation, Project administration, Visualization, Data curation, Supervision, Methodology, Writing – review & editing, Funding acquisition, Conceptualization, Writing – original draft, Software, Investigation, Resources.

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

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