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BAKUNANAYS guidelines for communicating COVID-19 vaccination information to pregnant women in the Philippines and other developing countries

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COVID-19 remains a pressing global health disaster, and pregnant women and their unborn child/ren continue to be extremely at risk. In the Philippines, a developing country in Southeast Asia, pregnant women were generally excluded from initial vaccination drives to avoid adverse effects in their offspring, amidst findings from animal studies and post-trial monitoring on the vaccines' safety. In August 2021, the Philippine Obstetrical and Gynecological Society (POGS) and the Department of Health (DOH) released guidelines for the vaccination of pregnant women due to the eventual increase in their mortality during outbreaks of the Delta variant. This perspective presents various forms of scientific communication on COVID-19 vaccination to Filipino pregnant women and forwards recommendations to improve communication in various settings. First, we present three modalities on how information on COVID-19 vaccination is disseminated to pregnant women in the Philippines and discuss their potential impacts on knowledge promotion and actual vaccination uptake, taking into account the Filipino cultural value of "pakikipagkapwa". These include government and doctor-led initiatives, social media posts and comments, and experiences of one of the authors in vaccination drives in rural and remote communities. Findings are used to develop the BAKUNANAYS guidelines, comprised of 10 recommendations for healthcare workers, health agencies, and doctors vaccinating pregnant women in the Philippines and other developing countries, especially those with a similar socio-economic profile and cultural values.

KEYWORDS

health communication, vaccination, COVID-19, kapwa, pregnant women, cross-cultural bioethics

Introduction

Pregnant women are highly vulnerable during COVID-19, with them and their infants having a significantly higher risk of morbidity and intensive care units (ICU) admissions. Maternal mortality risk is even higher for women coming from areas with less resources for emergency care (Villar et al., 2021; Morgan et al., 2022).

In the Philippines, a developing country in Southeast Asia with a population of more than 110 million, at least 141 million doses of COVID vaccines have been administered as of March 2022, covering ~65.7% of the population (Department of Health, 2022). Although COVID-19 vaccination in the Philippines has already gained traction, vaccination only began in March 2021 due to limited supplies. Several vaccines with established efficacy and safety, such as Pfizer BioNTech, AstraZeneca, Moderna, and Sinovac, have been approved by the Philippine Food and Drug Administration (FDA) under the Emergency Use Authorization (EUA) since March 2021 (Centers for Disease Control Prevention, 2022; Food and Drug Administration Philippines, 2022). Although these were also approved for pregnant women, only healthcare workers were initially eligible for vaccination due to their higher risk of contracting the virus (Department of Health, 2021). With the incursion of the Delta variant in June 2021, higher numbers of symptomatic pregnant women have succumbed to COVID-19 (Division of Infectious Diseases, Dept. of Obstetrics and Gynecology, Philippine General Hospital, unpublished data 2021). Hence, the Philippine Department of Health (DOH) and the Philippine Obstetrical and Gynecological Society (POGS) released updated guidelines in August 2021 for vaccination of pregnant and lactating mothers (Philippine Obstetrics Gynecological Society, 2022), allowing all eligible pregnant women, preferably beyond their first trimester, to be vaccinated.

Despite the evidence, pregnant and lactating Filipino mothers remain vaccine-hesitant. In Dr. Cagayan's personal communication with DOH personnel, roughly 19% or 85,000 out of the target 452,600 pregnant women have been fully vaccinated as of March 24, 2022. The Dengue vaccine controversy in the Philippines significantly influenced attitudes toward vaccination of children and neonates. In 2016–2017, 800,000 children participated in a massive national school-based immunization campaign using Dengvaxia, the world's first commercially available dengue vaccine developed by Sanofi Pasteur (Magal et al., 2021). However, during that time, there was limited empirical data supporting its safety. Moreover, there was relentless media coverage on the deaths of seven children who received the vaccine (Yu et al., 2021). This incident has significantly undermined public trust in vaccines, leading to eventual outbreaks in the country of vaccine-preventable diseases such as measles and polio (The Guardian, 2017; Sci Dev Net, 2019; Relief Web, 2021).

Further impacting national vaccination rates is the state of Philippine science communication, wherein there are limited programs for dedicated science communication training and minimal government funding for science communication initiatives (Navarro and McKinnon, 2020). There are also significant socio-economic and demographic disparities in accessing scientific information, with science seldom or rarely present in broadsheets, tabloids, television channels, and public radio (Navarro and McKinnon, 2020). There is also the problematic positioning of science, where it is portrayed as “a field of proof and absolutes” (Ponce de Leon et al., 2020). This framing makes it difficult for the public to understand and trust scientists, especially when there are discordant views and constantly changing scientific evidence (Ponce de Leon et al., 2020). Moreover, there is underrepresentation of particular sectors and marginalized communities, such as women from lower socio-economic classes, in television debates surrounding health policies (Curato and Ong, 2014). Whenever they are included, marginalized individuals are usually presented as narrative, as opposed to deliberative, agents. Their stories are often narrated, portrayed, and/or publicized, but they are usually not given ample opportunities to debate with other stakeholders and deliberate on health and scientific issues that ultimately impact them (Curato and Ong, 2014). Finally, religion still shapes conversations regarding public health (Curato and Ong, 2014), and whenever pitted with science, it is always considered “right” (Montemayor et al., 2020).

Aside from trust in science, Filipino culture also impacts vaccine perceptions and uptake. “Pakikipagkapwa”, a core value in Filipino social psychology (Enriquez, 1978), is a sense of mutual regard for the shared humanity that is found in one's fellows. Its root word “kapwa” does not just refer to the shared identity that frame the way Filipinos think of their fellows (Enriquez, 1978), it also pertains to the relationship-oriented nature of how Filipinos view a life of virtue (Reyes, 2015). This social virtue motivates Filipinos to help each other in times of calamity or crises (Concepcion, 2016). During the COVID-19 disaster, the value of “kapwa” on Filipinos' duty to be vaccinated has been explored (Mendoza, 2021). “Kapwa” can lead to a caring attitude that encourages Filipinos to get vaccinated. However, “kapwa” can also lead to a bandwagon morality for pressuring vaccine uptake on those who may have legitimate doubts on the trustworthiness of some vaccines or fears of adverse effects due to underlying health conditions. It underscores the importance of encouraging vaccine uptake in an inclusive nature, e.g., in a way that is not hasty in treating vaccine skeptics as social deviants who undermine public health. Thus, “kapwa” can be a very useful tool in communicating with vulnerable members of the Filipino population, including pregnant women. It also has the potential to overcome the deficit model of science communication that treats the public as mere recipients of information from enlightened scientists (Navarro and McKinnon, 2020).

The COVID-19 situation, science and health communication landscape of the Philippines, and Filipino cultural values make the Philippines a valuable context to examine various communication and miscommunication endeavors for at-risk populations during the ongoing COVID-19 disaster. This is particularly relevant given how the COVID-19 pandemic is also considered to have involved an infodemic, i.e., an outbreak of multiple sources of information (e.g., social media) that caused confusion and additional anxiety amidst a public health crisis (Baines and Elliott, 2020; Banerjee and Meena, 2021). In this context, we shall refer to misinformation as an umbrella concept that refers to the various myths, rumors, pseudoscience, falsehoods, and altered facts that have been spread during the COVID-19 pandemic (e.g., whiskey or Ivermectin cure for COVID-19), as opposed to information from peer-reviewed publications and established health organizations. We focus specifically on how misinformation related to vaccination of pregnant women makes this sector more vulnerable.

Narratives from the Philippines on how COVID-19 vaccination information (knowledge from established scientific bodies, such as national or global health organizations) is communicated provides a useful case study on how socio-structural forces and values influence the spread, content, and valence of information and misinformation (or information that deviates from peer-reviewed scientific publications and health society recommendations). Moreover, narratives from the Philippines can contribute to ongoing efforts to counter cultural narrowness in science communication (Finlay et al., 2021) by illustrating how health information is communicated in a Southeast Asian and developing world context. They are also expected to enrich science, health, and risk communication discourse in a country of 120 million people, where unfortunately, there are only 58 Scopus-indexed articles that mention “(‘health communication’ OR ‘science communication’ OR ‘risk communication’) AND (Philippines)” in their title or abstract.

We employ a mixed-methods approach, eliciting information from social media accounts of relevant organizations to identify illustrative cases (Flores and Asuncion, 2020) and conducting collaborative autoethnography (Nowakowski and Sumerau, 2019; Viana et al., 2022) to facilitate greater reflexivity on Filipino sociocultural values (Chang, 2016) and how they can be integrated in health promotion campaigns. To declare our positionality (Bolade-Ogunfodun et al., 2022), Dr. Cagayan is a female Filipino obstetrician-gynecologist with three children and with 25 years of experience attending to pregnant women in urban and rural Philippine areas, while Prof. Mendoza and Dr. Viana are both male Filipinos with training in cross-cultural bioethics and lived experience in rural and urban areas of the country. Through these methods, we illustrate three ways in which information and misinformation on COVID-19 vaccination for pregnant

women can be disseminated in the Philippines, and we reflect on their potential impacts on vaccination uptake. Through an inductive approach (O’Reilly, 2009), collaboratively reflecting on the modalities in which vaccination information has been communicated to pregnant women in the Philippines, we then present the BAKUNANAYS guidelines, comprised of 10 concrete recommendations to improve COVID-19 vaccination communication in the Philippines. These recommendations can be refined and applied to other countries with similar socio-economic profiles and cultural values.

Various modes of COVID-19 vaccination information dissemination in the Philippines

Official online communication by medical societies, health agencies, and local governments

Materials on COVID-19 vaccination are often posted as images or infographics on the websites and social media profiles of the Philippine Department of Health (DOH), Philippine Obstetrics and Gynecological Society (POGS), and/or local government units. For instance, DOH has a five-part infographic, with four slides responding to questions on vaccination and breastfeeding, pregnancy (Figure 1A), planned pregnancy, and pregnancy tests. There is one question, a one-to-four-sentence answer, and a relevant image per slide (Figure 1A). These infographics are also available in Filipino and are shared on the DOH Facebook page (Facebook, 2022b), with the original post on March 11, 2021 having 4,506 likes and hearts, 618 comments, and 6,700 shares as of April 8, 2022.

POGS has also released a 3-min video on February 2, 2022 that provides the latest information on COVID-19 vaccination and pregnant women. The video features two male and three female doctors answering five questions on providing COVID-19 vaccines and boosters to pregnant (24-s screenshot on Figure 1B) and breastfeeding women and on considerations regarding COVID-19 vaccine administration in the Philippines. The responses are concise, usually taking only 20 s per question; spoken clearly; and in English. The video ends with an image of the fourth update of the POGS Practice Bulletin on “COVID-19 Vaccination of Pregnant and Breastfeeding Women”. As of April 8, 2022, the video on Facebook received 184 likes and hearts, 2 comments, and 9,600 views (information on the number of shares cannot be retrieved). POGS also did not respond to one comment on where to get a COVID-19 vaccine without a doctor’s consent or medical consultation.

Local government units have also posted infographics on their social media accounts. For instance, the City Government of Taguig has a Twitter post with an infographic, both in English,



FIGURE 1 Informational materials from (A) the Philippine Department of Health (DOH) Facebook page (Facebook, 2022a), (B) the Philippine Obstetrics and Gynecological Society (POGS) video (23-s screenshot), (C) a local government unit (Taguig), (D) post in Sitti's Facebook profile that promotes vaccination, and (E) post in the Usapang Nanay publicly-accessible Facebook page that discourages COVID-19 vaccination during pregnancy (Facebook, 2022c).

that encourages pregnant women to get vaccinated (Figure 1C; Twitter, 2022). The infographic portrays a healthcare worker answering questions from a pregnant woman on her vaccination eligibility and potential effects of the vaccine on the baby. The infographic also included a warning regarding the Gamaleya Sputnik V vaccine and a link to the city's contact tracing website, which also provides vaccination updates and contact numbers. The post had a much lower engagement, especially when compared to the DOH Facebook post in Figure 1A. Although the I Love Taguig Twitter account has more than 76,000 followers, the post only has 13 engagements (2 retweets, 4 quote tweets, and 7 likes) as of April 8, 2022.

During the third quarter of 2021, Facebook was used by 96.2% of Filipino internet users, whereas Twitter was only used by 59.2% (Statista, 2022a). Overall, online information on COVID-19 vaccination for pregnant women is available in the social media profiles of Philippine health agencies, medical associations, and local government units. However, these materials received varying levels of engagement, highlighting the importance of acknowledging local preferences when disseminating information online.

Although the visual readability (Garner et al., 2012) of these graphics is excellent, their linguistic readability and comprehensibility (Garner et al., 2012) can be improved by replacing medical jargon such as “contraindication” with simpler terms. Alternatively, the first sentence can just be deleted (Figure 1A). To improve trustworthiness, the infographics, or the associated Facebook post, could include links to actual studies with information on the safety and efficacy of these vaccines for pregnant women and the unborn child, instead of just providing the social media accounts of DOH. DOH also did not respond to comments on the post, which include concerns on availability and potential harmful effects on asymptomatic cases. It is alarming that POGS and DOH did not respond to comments, highlighting glaring gaps in engagement and deliberation (Curato and Ong, 2014) in Philippine science and health communication.

Finally, only the post and infographic from the local government unit included a link for vaccination, limiting the actionability (Shoemaker et al., 2014) of the posts from DOH and POGS. It is crucial that health promotion materials encouraging pregnant women to get vaccinated also provide explicit instructions (Shoemaker et al., 2014) on when, where, and how they can get vaccinated. Although DOH and POGS are national agencies, including a link where people could find their nearest vaccination center could help information recipients take concrete steps toward getting their first, second, or booster dose.

Public-led vaccination promotion or dissuasion initiatives on social media

Aside from official materials released by health experts, there is also information shared by pregnant women themselves. These are often posted on Facebook pages, such as Milk Matters (with 3,352 likes and 3,411 subscriptions). Posts and corresponding comments on social media groups or accounts can also provide another way for the public to get information on vaccines. Members can easily start a discussion simply by posting in a group like “Usapang Nanay (Buntis, Expecting Moms, Anything about Motherhood)” with over 50,000 members. Threads in these groups, along with those in personal social media accounts, serve as a virtual version of face-to-face conversations, as information can be easily propagated by any member of the public through posting and commenting. For example, the personal Facebook account of Sitti, a Filipino pregnant celebrity, has a post expressing her support for vaccination, garnering 3,100 likes, 226 comments, and 243 shares (Figure 1D).

In cases where social media is used to spread information, “kapwa” can be useful in understanding the communal and relationship-oriented nature of the communication process involved in vaccine acceptance. “Kapwa” is that shared sense of identity that makes people more inclined to trust and listen to those whom they have similar experiences with. Laypeople are more likely to participate in these kinds of discussions because they prefer to know more about other people's personal experiences. *Via* these threads, the general public can openly engage in discussions about topics relevant to them—like vaccines. Thus, pregnant women listen more to the opinion of their fellow mothers, sometimes even more than doctors, as demonstrated by the greater public engagement in Sitti's post compared to that of POGS. Given the constant exposure of the public to celebrities, which leads to a greater sense of attachment (Hoffman and Tan, 2015) and relationality, they can be an important resource for public health promotion efforts, using their influence to bring about positive changes in health behaviors (Hoffman et al., 2017). The effect can even be magnified when information recipients share a similar self-conception or identity (Hoffman and Tan, 2015), such as being pregnant, with the celebrity.

Although there are COVID-19 vaccination promotion initiatives on social media, there is also mis- and dis-information shared. For instance, in the Facebook page “Usapang Nanay”, a mother believed that the COVID-19 vaccine causes coughs, colds, and rashes (Figure 1E). She said that she is scared of taking the vaccine while pregnant, that's why she decided to take it after giving birth. These vaccine hesitancy narratives could have been motivated by anti-vaccination videos by other members of the public (Inquirer, 2022), or even by some doctors (DZRH, 2020; Quijano, 2020; Philippine News Agency, 2021); and taken

together, they can influence vaccination attitudes by pregnant women in the Philippines.

From the perspective of *kapwa*, even dissenting views about COVID-19 vaccines are healthy, and they can be useful starting points to address mothers' actual fears and misconceptions. For example, from hearing pregnant mothers' worries that vaccines may cause rashes, vaccination promotion initiatives can include testimonies from others who did not experience these adverse effects. This scenario can be found in the Facebook group thread (Figure 1D) where a fellow pregnant mother celebrity shared her experience of being vaccinated safely and expressed concern about COVID-19 related deaths among pregnant moms. However, it is important for healthcare workers and communicators not to conceal or sugarcoat adverse events, but rather, be transparent on their prevalence, availability of mitigating interventions, severity, and impact when compared to actual COVID-19 symptoms.

Misinformation can be dealt with facts, but claims to conspiracy theories can be dealt with testimonies from trusted fellows and members of the community. This is an implication of the Filipino culture of "*kapwa*": people tend to believe testimonies more than scientific data, especially when they have shared identity and/or established relationship with the information provider. This motivates pregnant women to engage in debates about COVID-19 vaccines. Despite potential disagreement, each of them simply wants the best for their fellow mothers.

Communicating vaccination information in rural and remote communities

From Dr. Cagayan's interactions with mothers in rural and remote communities, word of mouth, established relationships with healthcare providers, and the opinions of elders/community leaders play a key role in people's willingness to get vaccinated. For instance, in her medical missions to the Philippine provinces of Pangasinan and Pampanga, patients are eager to learn about the efficacy and safety of available vaccines from their doctors. In most cases, once patients receive adequate information, they agree to be vaccinated. In Surigao del Norte, pregnant mothers are more likely to get vaccinated once they see their husbands, relatives, and leaders get vaccinated and do not experience adverse side effects. Moreover, if they observe unvaccinated neighbors having severe COVID, they may be convinced to get vaccinated. In some "*barangays*" or neighborhoods, there are assigned "*Mother Leaders*" who make house-to-house announcements. However, during these vaccination drives, some community members, such as indigenous people in remote areas of Surigao del Norte, leave their houses to avoid vaccination. Since they live in remote mountainous areas and have limited exposure to people outside

their community, they do not believe in COVID-19, which then makes them doubt the value of vaccination.

Dr. Cagayan's experiences demonstrate that online promotion of COVID-19 vaccination by government institutions and other concerned stakeholders may not reach members of remote and rural communities. Although the Philippines belongs to the top 11 countries with highest rates of online engagement as of February 2022, a significant portion of the population still have limited or no access to the internet (Steffens et al., 2020; Statista, 2022b). Thus, offline modes of information dissemination are also important for COVID-19 vaccine awareness. It is in these cases where information travels by word of mouth and where conversation becomes informal and personal that the value of *kapwa* and its attendant concern for the wellbeing of one's fellows becomes integral (Lagdameo-Santillan, 2018). Thus, decentralized forms of science communication through personal and established relations with the community are equally necessary. Simply providing information on vaccine mandates, and accompanying risks and benefits, through physical posters and leaflets may not be enough. Health experts need to immerse in community discussions, maintain ongoing relationships, and account for community dynamics to build trust (Johnston et al., 2021) and encourage pregnant mothers, and their family members, to be involved in public health and vaccination initiatives.

These experiences on the ground demonstrate the importance of "*pakikipagkapwa*", which also entails context sensitivity or "*pakikiramdam*". Given a certain ignorance and mistrust about the safety of vaccines, information dissemination of vaccine safety and efficacy must be done by example. Scientists and health workers should partner with members of the community to build trust. Guided by "*pakikipagpagkapwa*", healthcare workers need to acknowledge where others are coming from (Molo (2022)). They must understand and minimize power differentials (Eliassen, 2016) when communicating with community members; and be more open to acknowledging and addressing their perceptions on COVID-19 vaccines in a collaborative and bidirectional manner (Neeman et al., 2011).

Ten recommendations to improve COVID-19 vaccination communication in the Philippines

From our illustrative review of different communication modalities on COVID-19 vaccination in the Philippines, we develop and propose the BAKUNANAYS guidelines for effective communication of vaccination information. BAKUNANAYS is a shortened version of "*bakuna para sa mga nanay*" or "*vaccination for mothers*" and also an acronym for each item in the recommendation. Each item begins with a Filipino word that encapsulates the key message of each recommendation. These guidelines were developed through an inductive approach

(O'Reilly, 2009; Chang, 2016) and collaborative interdisciplinary reflection, drawing from how COVID-19 information is communicated to and among pregnant women in online and offline spaces in the Philippines. Our analysis on how medical societies, health agencies, and local governments convey vaccine-related information on social media have led to recommendations 1 (Batayan), 2 (Asawa at kaanak), 4 (Unawa), 7 (Napapanahon), and 10 (Sukatin). On the other hand, exploring posts on the "Usapang Nanay" Facebook group and public posts on social media profiles of Filipino celebrity mothers led to the formulation of recommendations 5 (Negosasyon), 6 (Alinlangan), and 9 (Yayain). Finally, Prof. Cagayan's experience in vaccination drives in rural and remote Philippine communities guided the development of recommendations 2 (Asawa at kaanak), 3 (Kultura), 4 (Unawa), 5 Negosasyon), 7 (Napapanahon), 8 (Aksiyunan), 9 (Yayain), and 10 (Sukatin).

These guidelines echo existing Philippine and international recommendations on health and risk communication. These include the importance of interpersonal influencers (Atkin and Rice, 2013); cultural tailoring of messages (Noar et al., 2011); community-based and contextualized approaches (Ponce de Leon, 2020, 2021); relationality and partnership with community experts (Casas et al., 2021); engagement with multiple stakeholders, including primary healthcare workers (Guevarra et al., 2021); and framing messages as narratives that community members can readily disseminate (Lejano et al., 2020). As opposed to simply providing general recommendations, we have also suggested implementation plans that account for the Philippine context and socio-cultural values for ease of adoption by local health agencies.

Despite being based on information sources and autoethnographic narratives from the Philippines, the BAKUNANAYS guidelines can also be applied to other countries with a similar socioeconomic profile and cultural values, such as community-oriented and collectivist relationality that is present in several African (Adams et al., 2012), South American, and Asian cultures (Triandis and Suh, 2002). To further illustrate, there are growing calls in African cultures to incorporate the idea of "ubuntu" (Mugumbate, 2020) in reassessing COVID-19 health care interventions such as those in hospital visitations (Mulaudzi et al., 2022) and health communication (Ngondo and Klyueva, 2022). Like the Filipino value of "kapwa", the African value of "Ubuntu" evokes an ontological priority of the community over the individual in dealing with pressing health issues. In this context, "pakikipagkapwa" and "ubuntu" can be taken together to strengthen calls in Asia, Africa, and beyond to acknowledge communal values and relationalities, include various family and community members, and engage with multiple sectors in promoting COVID-19 vaccination for pregnant women and other vulnerable social groups (See Recommendations 3 and 9 in Table 1). Invoking these concepts, values, and

local terminologies in health communication in non-Western regions is crucial to prevent alienation and further colonial encroachment from a Western-originating health intervention, such as a COVID-19 vaccine.

Discussion and conclusions

By illustrating different ways in which Filipinos, especially pregnant women, can get information on COVID-19 vaccination, we highlight how science and risk communication on vaccination in developing countries, such as the Philippines, occurs in both online and offline spaces. Various contexts provide varying opportunities for deliberation (Curato and Ong, 2014), particularly between pregnant women, their family and community members, and healthcare workers. Although health agencies and medical societies could serve as the most reliable and evidence-based information source, their efforts can be hampered by lack of engagement with information recipients and a limited sense of "kapwa" as a result of differences in power (Eliassen, 2016) and identity (Hoffman and Tan, 2015). Thus, other pregnant women and members of the community play key roles in sharing information on COVID-19 and COVID-19 vaccination, both online and offline. In its use of an egalitarian and context sensitive approach to COVID-19 vaccine communication, the BAKUNANAYS guidelines offer a more bi-directional approach to risk communication that can help address the lack of trust on the highly authoritative and top-down approach to risk communication that has been implemented in many developing countries during the COVID-19 pandemic (Ahmed et al., 2022).

It is recommended that future research validates the guidelines proposed in actual practice through other structured quantitative or qualitative methodologies, such as interviews, focus groups, and surveys involving pregnant women, their family, doctors, public health officials, and allied health practitioners. This perspective piece is also limited by the disciplinary training of the authors, their socio-economic status, and experiences of Filipino culture based on their Philippine region of origin. Further iterations of these guidelines should incorporate the perspectives of pregnant women in various contexts, either through empirical data or better yet, through co-creation. Through this perspective, we hope to have added to non-Western insights in science, health, and risk communication, and have paved the way for further empirical investigation on health promotion for pregnant women in developing countries and beyond. Given increase in case numbers due to Omicron subvariants, vaccination remains an important strategy in the global response to COVID-19. Thus, ensuring that vulnerable populations, such as pregnant women and their unborn, both have access to the vaccines/boosters and to correct information regarding

TABLE 1 BAKUNANAYS guidelines for communicating COVID-19 information to pregnant women in the Philippines and in countries with similar socio-demographic profiles and cultural values.

Recommendation	Implementation plan
<p>1. BATAYAN (<i>basis</i>): Communication materials should be based on evidence on the safety and efficacy of vaccines for pregnant women and also on established guidelines for effective health communication.</p>	<p>Health agencies and medical societies should systematically review evidence and include them in health promotion materials, while ensuring that the information presented is still readable and understandable by the public and that links to additional resources and more extensive information are provided. They could also follow established guidelines or checklists, such as the Suitability Assessment of Materials (SAM) and Patient Education Materials Assessment Tool (PEMAT), to ensure comprehensibility, readability, and actionability of informational materials.</p>
<p>2. ASAWA at kaanak (<i>spouse and relatives</i>): Partners/spouse and parents of the mother should also be recipients of communication materials.</p>	<p>In a typical Filipino household, women usually observe the actions and listen to the advice of their spouse and relatives. Inclusion of these persons as targets for information dissemination by all stakeholders, both government and non-government agencies and community members, would significantly increase uptake of vaccination.</p>
<p>3. KULTURA (<i>culture</i>): Cultural values should be acknowledged in communication materials and drives.</p>	<p>Health experts should share information on how the risks of being unvaccinated will pose greater health risk to household members (given the strong family ties and living arrangement of most Filipino families). Health experts should involve members of the extended family in discussing vaccine awareness since they are also part of the decision-making process, especially in rural and remote areas. These discussions should generally be informal to encourage honest expression of views.</p>
<p>4. UNAWA (<i>understanding</i>): Communication channels and strategies should be tailored toward different ethnolinguistic groups, including Indigenous people, and socio-economic classes.</p>	<p>Medical societies representing linguistic regions should translate vaccine materials into local dialects. There should be face-to-face communication through local health workers in rural and remote areas where internet connection is limited or not available. Such modes of communication should also be publicized in public areas; e.g., churches, basketball courts, barangay halls, local eateries, and grocery stalls. Location and timing of digital information provision should also be accounted for to maximize viewership (should be around dinner time for Filipinos).</p>
<p>5. NEGOSASYON (<i>negotiation</i>): Opportunities should be provided for two-way engagement, wherein pregnant women and their family members, especially vaccine-hesitant people, are given the opportunity to ask questions.</p>	<p>Public health workers should be in a congenial form of negotiation with health stakeholders. They should use lay language and become mindful that their tone shares information out of care, concern, and public service. Patience and empathy should be employed in engaging with vaccine skeptics. Scientific explanations should also be coupled with examples and testimonies from fellows and friends in the community.</p>
<p>6. ALINLANGAN (<i>doubts</i>): Materials should combat disinformation, in addition to providing new information.</p>	<p>Vaccine hesitancy stems from fears of mothers of potential harm to them and their babies. Mis—and disinformation that appears in all media platforms, especially those spread by health experts themselves, should be monitored and reported to official health departments and other concerned government agencies.</p>
<p>7. NAPAPANAHON (<i>timely</i>): Materials should be regularly updated, and outdated materials should be taken down/removed.</p>	<p>Health information materials and information provided during vaccination drives should be constantly updated, especially when there is new evidence on the safety and efficacy of the vaccines on predominant virus variants. To avoid confusion, older materials on social media accounts of health agencies and medical societies should be removed to ensure that the public only sees the most up-to-date information.</p>
<p>8. AKSIYUNAN (<i>take action</i>): Actions enforcing vaccination, and accompanying materials to disseminate these policies, must also address vaccine hesitancy by providing information on COVID-19 vaccines.</p>	<p>Whenever regulations on vaccination (for entry to certain establishments, etc.) are shared to the public, they should be accompanied by information on the benefits and risks of COVID-19 vaccines and on where/how people can get vaccinated. Although it is important to take action to prevent viral transmission and sickness <i>via</i> vaccination, actions by local government units should also promote health literacy and combat mis/disinformation on vaccine safety and efficacy.</p>
<p>9. YAYAIN (<i>invite</i>): Multiple sectors should be mobilized and should play a key role in communicating vaccine information and encouraging vaccine uptake.</p>	<p>In as much as the persistent battle cry of this pandemic in the Philippines remains to be “No one is safe until everyone is safe”, all sectors of society should have a shared responsibility in ensuring herd immunity. Advocates from different social groups, such as doctors, husbands, and mothers, and sectors (government, medical, education, NGOs, corporations, etc.) should lend their voice in inviting every eligible Filipino family to get vaccinated.</p>
<p>10. SUKATIN (<i>measure</i>): The impact of health promotion initiatives on actual vaccine uptake should be measured, and strategies should be refined when deemed ineffective.</p>	<p>Health agencies and medical organizations should assess vaccination promotion programs and other communication initiatives to determine their reach and impact on vaccination uptake. If social media posts end up having limited engagement or offline communication strategies do not encourage people to get vaccinated, they should be refined to ensure that they remain both impactful and cost-effective.</p>

their risks and benefits will and should remain a key public health priority.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding authors.

Author contributions

Most of the cases on communicating COVID-19 information to pregnant women came from MC and her reflections on her public health engagements and clinical practice. The research of LM and JV on science communication, Filipino virtue ethics, and cross-cultural bio ethics provided the background for the various discussions and recommendations in this perspective piece. All authors contributed equally to the planning, conceptualization, and writing of this work. All authors contributed to the article and approved the submitted version.

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References

- Adams, B. G., Van de Vijver, F. J. R., and Bruin, G. D. P. (2012). Identity in South Africa: Examining self-descriptions across ethnic groups. *Int. J. Intercult. Relat.* 36, 377–388. doi: 10.1016/j.jintrel.2011.11.008
- Ahmed, N., Rony, R.J., Sinha, A., Ahmed, M.S., Saha, A., Khan, S.S., et al. (2022). Risk communication during COVID-19 pandemic: impacting women in Bangladesh. *Front. Commun.* 7, 878050. doi: 10.3389/fcomm.2022.878050
- Atkin, C., and Rice, R. (2013). "Theory and principles of public communication campaigns," in *Public Communication Campaigns*. (Thousand Oaks, CA: Sage Publications), 2–19.
- Baines, D., and Elliott, R. J. R. (2020). "Defining misinformation, disinformation and malinformation: An urgent need for clarity during the COVID-19 infodemic," in *Discussion Papers 20-06*, Birmingham: Department of Economics, University of Birmingham.
- Banerjee, D., and Meena, K. S. (2021). COVID-19 as an "Infodemic" in public health: critical role of the social media. *Front. Public Health.* 9, 610–623. doi: 10.3389/fpubh.2021.610623
- Bolade-Ogunfodun, Y., Richmond Soga, L., and Laker, B. (2022). Entwined positionality and interpretive frames of reference: an autoethnographic account. *Organ. Res. Methods.* doi: 10.1177/10944281221111401
- Casas, E. V., Jr., Pormon, M. M., Manus, J. J., and Lejano, R. P. (2021). Relationality and resilience: environmental education in a time of pandemic and climate crisis. *J. Environ. Educ.* 52, 314–324. doi: 10.1080/00958964.2021.1981205
- Centers for Disease Control and Prevention (2022). *Safety of COVID-19 Vaccines*. Available online at: <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/safety/safety-of-vaccines.html> (accessed March 18, 2022).
- Chang, H. (2016). Autoethnography in health research: growing pains? *Qual. Health. Res.* 26, 443–451. doi: 10.1177/1049732315627432
- Concepcion, F. (2016). "The Myth of 'kapwa'." in *Rappler*. Available online at: <https://www.rappler.com/moveph/124625-myth-kapwa-philipino-trait/> (accessed March 26, 2022).
- Curato, N., and Ong, J. C. (2014). Inclusion as deliberately agency: the selective representation of poor women in debates and documentaries about reproductive health. *Telev. New Media.* 16, 576–594. doi: 10.1177/1527476414554401
- Department of Health (2021). *Vaccines*. Available online at: <https://doh.gov.ph/faqs/vaccines> (accessed March 18, 2022).
- Department of Health (2022). *Vaccination Dashboard*. Available online at: <https://doh.gov.ph/covid19-vaccination-dashboard> (accessed March 18, 2022).
- DZRH (2020). *Dr. Romeo Quijano: Delikado ang vaccine kay sa virus*. Available online at: <https://www.youtube.com/watch?v=mjYJoQu2O4M> (accessed April 1, 2022).
- Eliassen, H. (2016). Power relations and health care communication in older adulthood: educating recipients and providers. *Gerontologist.* 56, 990–996. doi: 10.1093/geront/gnv095

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Conflict of interest

The authors declare 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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- Enriquez, V. G. (1978). Kapwa: a core concept in filipino social psychology. *Philipp. Soc. Sci. Humanit. Rev.* 42, 100–108.
- Facebook (2022a). *COVID 19 Vaccination in Pregnant and Breastfeeding Women*. Available online at: <https://www.facebook.com/watch/?v=987380168840970> (accessed April 8, 2022).
- Facebook (2022b). *DOH Frequently Asked Questions (FAQs) on COVID-19 Vaccines and Pregnancy*. Available online at: https://www.facebook.com/permalink.php?story_fbid=4217077958303424&id=156566631021264 (accessed April 8, 2022).
- Facebook (2022c). *Usapang Nanay (Buntis, Expecting Moms, Anything about Motherhood)*. Facebook Post. Available online at: <https://www.facebook.com/groups/800098180116288/posts/4665337880258946> (accessed April 1, 2022).
- Finlay, S. M., Raman, S., Rasekoala, E., Mignan, V., Dawson, E., Neeley, L., et al. (2021). From the margins to the mainstream: deconstructing science communication as a white, Western paradigm. *JCOM J. Sci. Commun.* 19, C02. doi: 10.22323/2.20010302
- Flores, R., and Asuncion, X. V. (2020). Toward an improved risk/crisis communication in this time of COVID-19 pandemic: a baseline study for Philippine local government units. *JCOM J. Sci. Commun.* 19, A09. doi: 10.22323/2.19072020
- Food and Drug Administration Philippines (2022). *List of FDA Issued Emergency Use Authorization*. Available online at: <https://www.fda.gov.ph/list-of-fda-issued-emergency-use-authorization/> (accessed March 18, 2022).
- Garner, M., Ning, Z., and Francis, J. (2012). A framework for the evaluation of patient information leaflets. *Health. Expect.* 15, 283–294. doi: 10.1111/j.1369-7625.2011.00665.x
- Guevarra, J. P., Zuñiga, Y. M. H., Uezono, D. R., Go, J. J. L., Granada, C. N., and Manese, D. T. (2021). Developing an interpersonal communication material for primary health-care workers for the prevention and control of noncommunicable diseases: experience from a case in Manila, Philippines. *J. Health Res.* 36, 685–695. doi: 10.1108/JHR-07-2020-0283 (accessed June 30, 2022).
- Hoffman, S. J., Mansoor, Y., Natt, N., Sritharan, L., Belluz, J., Caulfield, T., et al. (2017). Celebrities' impact on health-related knowledge, attitudes, behaviors, and status outcomes: protocol for a systematic review, meta-analysis, and meta-regression analysis. *Syst. Rev.* 6, 13. doi: 10.1186/s13643-016-0395-1
- Hoffman, S. J., and Tan, C. (2015). Biological, psychological and social processes that explain celebrities' influence on patients' health-related behaviors. *Arch. Public Health Archives belges de sante publique* 73, 3. doi: 10.1186/2049-3258-73-3
- Inquirer (2022). *Woman Who Went Viral for Slamming 'No Vaccine, No Ride' Policy Says Sorry*. Available online at: <https://newsinfo.inquirer.net/1543217/woman-who-went-viral-for-slamming-no-vaccine-no-ride-policy-says-sorry> (accessed April 1, 2022).
- Johnston, C. S., Belanger, E., Wong, K., and Snadden, D. (2021). How can rural community-engaged health services planning achieve sustainable healthcare system changes?. *BMJ Open* 11, 047165. doi: 10.1136/bmjopen-2020-047165
- Lagdameo-Santillan, K. (2018). *Roots of Filipino Humanism (1) "Kapwa"*. *Presenza*. Available online at: <https://www.presenza.com/2018/07/roots-of-filipino-humanism-1kapwa/> (accessed April 1, 2022).
- Lejano, R. P., Casas, E. V., Jr., Pormon, M. M. M., and Yanger, M. J. (2020). Teaching to the nth: narrative knowledge and the relational model of risk communication. *Int. J. Disaster. Risk. Reduct.* 50, 101720. doi: 10.1016/j.ijdrr.2020.101720
- Magal, P., Seydi, O., Webb, G., and Wu, Y. (2021). A model of vaccination for dengue in the Philippines 2016–2018. *Front. Appl. Math. Stat.* 7, 760259. doi: 10.3389/fams.2021.760259
- Mendoza, L. G. (2021). "Ang patungon sa etika ng kapwa at pagbabakuna" in *Lecture for the UPLB Philosophy Week Celebration Vaccination: Bridging Philosophy and Science in the Discussion on Vaccination*. Available online at: https://www.facebook.com/PhilosocUPLB/videos/287039613001130/?extid=NS-UNK-UNK-UNK-UNK_GK0T-GK1C-GK2C&ref=sharing (accessed March 26, 2022).
- Molo, J. (2022). *Rappler. Small wins and 'pakikipag-kapwa'*. Available online at: <https://www.rappler.com/voices/thought-leaders/opinion-small-wins-fellowship-2022-philippine-elections/?fbclid=IwAR1MRABMGcDEU2fuweSjOyKvop3LkZV9O2VEdwbV3fgsliAf13WDJ95a0> (accessed March 26, 2022).
- Montemayor, G. J. S., Navarro, M. J., and Navarro, K. I. A. (2020). *Philippines: From Science Then Communication, to Science Communication*. Australian National University. 28. Available online at: <https://press-files.anu.edu.au/downloads/press/n6484/html/ch28.xhtml?referer=andpage=31> (accessed April 8, 2022).
- Morgan, J. A., Biggio, J. R., Martin, J. K., Mussarat, N., Chawla, H. K., Puri, P., et al. (2022). Maternal outcomes after severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection in vaccinated compared with unvaccinated pregnant patients. *Obstet. Gynecol.* 139, 107–109. doi: 10.1097/AOG.0000000000004621
- Mugumbate, J. (2020). "Samkange's theory of Ubuntu and its contribution to a decolonised social work pedagogy," in *The Routledge Handbook of Critical Pedagogies for Social Work*, eds C. Morley, P. Ablett, C. Noble, and S. Cowden (London: Routledge), 412–423.
- Mulaudzi, F.M., Anokwuru, R.A., Du-Plessis, M.A.R., and Lebeso, R.T. (2022). Reflections on the concomitants of the restrictive visitation policy during the COVID-19 pandemic: an ubuntu perspective. *Front. Sociol.* 6, 769199. doi: 10.3389/fsoc.2021.769199
- Navarro, K., and McKinnon, M. (2020). Challenges of communicating science: perspectives from the Philippines. *JCOM. J. Sci. Commun.* 19, A03. doi: 10.22323/2.19010203
- Neeman, N., Isaac, T., Leveille, S., Dimonda, C., Shin, J. Y., Aronson, M. D., et al. (2011). Improving doctor-patient communication in the outpatient setting using a facilitation tool: a preliminary study. *Int. J. Qual. Health. Care.* 24, 357–364. doi: 10.1093/intqhc/mzr081
- Ngondo, P. S. and Klyueva, A. (2022). Toward an ubuntu-centered approach to health communication theory and practice. *Rev. Comm.* 22, 25–41. doi: 10.1080/15358593.2021.2024871
- Noar, S. M., Grant Harrington, N., Van Stee, S. K., and Shemanski Aldrich, R. (2011). Tailored health communication to change lifestyle behaviors. *Am. J. Lifestyle. Med.* 5, 112–122. doi: 10.1177/1559827610387255
- Nowakowski, A. C., and Sumerau, J. (2019). Reframing health and illness: a collaborative autoethnography on the experience of health and illness transformations in the life course. *Sociol. Health. Illn* 41, 723–739. doi: 10.1111/1467-9566.12849
- O'Reilly, K. (2009). "Inductive and deductive". In *Key Concepts in Ethnography* (SAGE Publications Ltd.), 104–109.
- Philippine News Agency (2021). *Vax Misinformation Hurts Efforts to Overcome Pandemic: DOH*. Available online at: <https://www.pna.gov.ph/articles/1150208?fbclid=IwAR33-c6BDGKArIcZcX4wOll4oLwCNY9r4rDffQUG6EiPHTWghRspXhwOF-sk> (accessed April 1, 2022).
- Philippine Obstetrics and Gynecological Society (2022). *POGS Practice Bulletin Number 1: COVID-19 Vaccination of Pregnant and Breastfeeding Women*. Available online at: <https://pogsinc.org/practice-bulletins/#single/0> (accessed March 19, 2022).
- Ponce de Leon, I. Z. (2020). Of warnings and waiting: an examination of the path of information for two communities hit by typhoon haiyan. *J. Risk Res.* 23, 598–612. doi: 10.1080/13669877.2019.1592212
- Ponce de Leon, I. Z. (2021). The purok system of san francisco, camotes: a communication perspective of community-based haiyan response. *Int. J. Disaster. Risk. Reduct.* 61, 102379. doi: 10.1016/j.ijdrr.2021.102379
- Ponce de Leon, I. Z., Custodio, P. A., and David, C. (2020). Depicting science in a public debate: the Philippine legal challenge against GMO eggplant. *Sci. Commun.* 41, 291–313. doi: 10.1177/1075547019846130
- Quijano, R. (2020). *Beware the Vaccine for Covid-19*. Academia. Available online at: https://www.academia.edu/42846554/Beware_the_Vaccine_for_Covid_19 (accessed April 8, 2022).
- Relief Web (2021). *Philippines: Re-emergence of Vaccine Preventable Disease (polio) – Final Report, DREF Operation*. Available online at: <https://reliefweb.int/report/philippines/philippines-re-emergence-vaccine-preventable-diseases-polio-final-report-dref> (accessed March 25, 2022).
- Reyes, J. (2015). Loób and Kapwa: an introduction to a filipino virtue ethics. *Asian Philos.* 25, 148–171. doi: 10.1080/09552367.2015.1043173
- Sci Dev Net (2019). *Philippine Disease Outbreaks Linked to Vaccine Fear*. Available online at: <https://www.scidev.net/asia-pacific/features/philippine-disease-outbreaks-linked-to-vaccine-fear/> (accessed March 25, 2022).
- Shoemaker, S. J., Wolf, M. S., and Brach, C. (2014). Development of the patient education materials assessment tool (PEMAT): a new measure of understandability and actionability for print and audiovisual patient information. *Patient. Educ. Couns.* 96, 395–403. doi: 10.1016/j.pec.2014.05.027
- Statista (2022a). *Favorite Social Media Site Among Internet Uses Philippines 2021*. Available online at: <https://www.statista.com/statistics/1290931/philippines-favorite-social-media-platforms-among-internet-users/> (accessed April 6, 2022).
- Statista (2022b). *Countries With the Highest Number of Internet Users as of February 2022*. Available online at: <https://www.statista.com/statistics/262966/number-of-internet-users-in-selected-countries/> (accessed April 1, 2022).

Steffens, M. S., Dunn, A. G., Leask, J., and Wiley, K. E. (2020). Using social media for vaccination promotion: practices and challenges. *Digit. Health*. 6, 1–9. doi: 10.1177/2055207620970785

The Guardian (2017). *Suspended Dengue Vaccine was Given to 730,000 Children, Philippines Says*. Available online at: <https://www.theguardian.com/world/2017/dec/05/suspended-dengue-vaccine-children-philippines-sanofi> (accessed March 24, 2022).

Triandis, H. C., and Suh, E. M. (2002). Cultural influences on personality. *Ann. Rev. Psychol.* 53, 133–160. doi: 10.1146/annurev.psych.53.100901.135200

Twitter (2022). *Taguig City Vaccination Task Force*. Available online at: <https://twitter.com/IloveTaguig1/status/1446767464344289283> (accessed April 6, 2022).

Viana, J. N., Severo, M. C., Barretto-Garcia, M., Magtaan, P. J., Liwag, J. T., Bueno, R. J., et al. (2022). “Malayang paglaladlad para sa mapagpalayang paglaladlad: coming out and queering science communication in contested spaces”. In: *Queering Science Communication*, eds T. Roberson and L. Orthia (Bristol: Bristol University Press).

Villar, J., Ariff, S., Gunier, R. B., Thiruvengadam, R., Rauch, S., Kholin, A., et al. (2021). Maternal and neonatal morbidity and mortality among pregnant women with and without COVID-19 infection: the INTERCOVID multinational cohort study. *JAMA Pediatr.* 175, 817–826. doi: 10.1001/jamapediatrics.2021.1050

Yu, V. G., Lasco, G., and David, C. C. (2021). Fear, mistrust, and vaccine hesitancy: Narratives of the dengue vaccine controversy in the Philippines. *Vaccine*. 39, 4964–4972. doi: 10.1016/j.vaccine.2021.07.051