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A SCOPING REVIEW OF FACTORS AFFECTING PARENTAL ACCEPTANCE OF DENGUE VACCINE IN THE PHILIPPINES

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Abstract

The study aims to illustrate the scoping factors affecting parental acceptance of the dengue vaccine vaccination in selected communities of Datu Odin Sinsuat, South Upi, and Buldon municipalities, Maguindanao province, Bangsamoro Autonomous Region in Muslim Mindanao, Philippines. This study employed a qualitative research design, using Key Informant Interviews (KII) and Focus Group Discussions (FGD) to explore the factors influencing parental acceptance or hesitancy of the dengue vaccine. A thematic analysis was conducted to identify recurring themes and insights related to vaccine decision-making. All participants were selected through purposive criterion sampling. Thematic analysis showed unacceptability of the dengue vaccine was associated with parental experience fear with dengue vaccination, unverified sources of information, and religious and cultural beliefs of the response. Post-dengue vaccination suspension triangulation indicated that the parents did not approves the experience of having a dengue vaccination, no trust to public institutions was er oded and the communication strategy was deemed inadequate. This led to low vaccine acceptability post-vaccine suspension.

Keywords: Scoping Review, Parental Acceptance, Dengue Vaccine, Philippines

INTRODUCTION

Dengue fever is an infectious viral disease transmitted by mosquitoes that continues to be a significant public health issue in the Philippines. The Philippines has among the highest dengue burden rates in Southeast Asia, with regular outbreaks that hit children most severely, particularly in urban and peri-urban settings. The disease, spread mainly by Aedes aegypti and Aedes albopictus vectors, manifests with a spectrum of illness from mild febrile illness to fulminant conditions like dengue hemorrhagic fever and dengue shock syndrome with potential mortality if not treated early. In view of the prevalent rate of dengue and its influence on public health, the Philippine government initiated a national dengue vaccination program in 2016 to curb the spread and severity of the disease.

The program applied the Dengvaxia vaccine, developed by Sanofi Pasteur, and first vaccinated children in public schools in Grade 4 (ninth year and older) in chosen regions, including Metro Manila, Central Luzon, and CALABARZON (Mendoza, Valenzuela, & Dayrit, 2020). The implementation was to give three doses of the vaccine every six months. The program was nevertheless plagued with issues right from the beginning. Uptake of vaccines was low owing to parental resistance, which resulted from a myriad of factors that included fears over vaccine safety, ignorance, and existing distrust towards government health interventions.

It worsened in December 2017 with Sanofi Pasteur releasing an advisory stating that Dengvaxia could increase the risk of severe dengue in an individual who had never been previously infected with the virus (Mendoza et al., 2020). This revelation sent panic and led to the suspension of the vaccination campaign by the Philippine Department of Health (DOH). The Dengvaxia scandal not only engendered public skepticism towards the vaccine itself but also had far-reaching effects on the rest of the country's immunization programs. Rising vaccine hesitation among parents, declining immunization rates, and general skepticism for public health initiatives were a consequence of the fear and uncertainty that followed.

In the Bangsamoro Autonomous Region in Muslim Mindanao (BARMM), where cultural and religious beliefs are determinants of health behaviours, the process of vaccine acceptance is more complex. The population in this region, particularly in Maguindanao province, has historically been plagued by poor access to healthcare due to geographical isolation, socio-economic disparities, and deep-seated distrust of government institutions. Interplay among these factors is a significant determinant of parental decisions regarding childhood vaccinations.

This study aims to provide a thorough analysis of the determinants of parental acceptance and hesitancy of the dengue vaccine in selected municipalities of Maguindanao, namely Datu Odin Sinsuat, South Upi, and Buldon. These municipalities are inhabited by a heterogeneous population, the Maguindanaon, Teduray, Lambangian, and Iranun, who have different cultural beliefs about health and vaccination. By an exploration of the lived experiences of the parents, their trust in public health institutions, and the effectiveness of communication strategies adopted in the dengue vaccine campaign, this research seeks to clarify the underlying reasons for vaccine hesitancy and outline potential interventions for strengthening vaccine confidence.

The study uses a qualitative research design, using key informant interviews (KII) and focus group discussions (FGD) conducted in 2022. The respondents were chosen purposively to include parents who accepted and those who refused the vaccination of their children. The research also considers demographic factors such as economic status, education levels, and gender in assessing perceptions towards vaccines. By employing thematic analysis, the study aims to obtain the in-depth opinions of the parents, particularly after the Dengvaxia controversy.

This research's findings are expected to contribute valuable lessons to the larger vaccine hesitancy discussion in culturally diverse and marginalized communities of individuals. Determining vaccine acceptance and refusal factors among Maguindanao individuals can guide the development of health communication strategy and trust-building activities with the view to improve public health interventions in BARMM but more importantly in regions that are facing a similar dilemma. By addressing parental concerns, increasing community engagement, and facilitating open communication between health facilities and communities, policymakers and healthcare providers can work to rebuild confidence in immunization programs and attain better health outcomes among vulnerable populations.

METHODS

This study employed a qualitative research design, using Key Informant Interviews (KII) and Focus Group Discussions (FGD) to explore the factors influencing parental acceptance or hesitancy of the dengue vaccine. A thematic analysis was conducted to identify recurring themes and insights related to vaccine decision-making.

The study was conducted in selected municipalities of Datu Odin Sinsuat, South Upi, and Buldon in Maguindanao province, Bangsamoro Autonomous Region in Muslim Mindanao (BARMM), Philippines. These municipalities are home to culturally diverse communities, including Maguindanaon, Teduray, Lambangian, and Iranun ethnic groups.

The respondents consisted of parents of eligible children for dengue vaccination. Two groups were identified: parents who consented to the vaccination and parents who refused. Selection criteria included economic status, educational attainment, and gender. A total of 10 key informant interviews (KII) and 5 focus group discussions (FGD) were conducted from the traditional leader and municipal health worker.

A semi-structured interview guide was developed based on determinants of vaccine hesitancy. The guide included questions on parental experiences, trust in public health institutions, cultural beliefs, media influence, and perceptions of the dengue vaccine. Focus group discussions were facilitated using structured discussion prompts.

The study used purposive criterion sampling, selecting participants based on predefined criteria relevant to vaccine acceptance and hesitancy. The sample included parents from diverse cultural backgrounds who either accepted or refused the dengue vaccine.

A thematic analysis was used to categorize data into key themes. Triangulation was employed to validate findings from different data sources, ensuring reliability and consistency in interpreting parental perspectives on vaccine acceptance and hesitancy.

RESULTS AND DISCUSSION

Table I. Parental Experience with the Dengue Vaccine.

Main Theme	Sub-Theme	Description
Parental Experience with Vaccination	Previous vaccine experience	The decision of parents to take the dengue vaccine was influenced by their past experiences with other government immunization drives. They took the vaccine if they had a good experience, while those who saw side effects or misinformation were resistant
	Perceived similarity to other vaccines	Parents thought that the dengue vaccine was similar to regular immunizations, which influenced their expectations and level of trust.
	Hospital and private vaccination costs	Government-offered vaccinations were seen as good by some parents due to budgetary constraints, as hospital and private vaccinations were expensive.
Barriers to Acceptance	Misinformation and lack of knowledge	Limited information on the vaccine, anxiety about side effects, and disinformation—mainly in distant communities—created hesitance.
	Fear and anxiety	Discussion around vaccine caused deaths raised anxiety and stress levels among parents, which sensitized them to hypersensitivity with regards to their children's health.
	Religious and cultural beliefs	Traditional beliefs and spiritual values shaped the mindset of parents on vaccine uptake or refusal.
Determinants of Acceptance	Severity of past dengue experiences	Parents who experienced the loss of a child or witnessed the extremes of severe cases of dengue were amenable to immunization, but those who acquired mild cases proved resistant.
	Government credibility and past controversies	Incidents like the Dengvaxia scandal diluted confidence in immunization campaigns headed by the government, particularly among rural communities.
	Accessibility and vaccine distribution issues	Delayed distribution of vaccines and poor logistics within rural areas served to fuel scepticism over immunization campaigns.
Economic and Emotional Impact	Financial burden	Parents who had faced economic crisis due to hospital expenses of dengue treatment felt worth in free government immunization.
	Regret and emotional distress	Some parents who accepted immunization later regretted it due to fear of side effects or seeing negative reports.
	Preference for private healthcare	Parents who were financially secure approached private medical professionals since they lacked faith in government programs.

Table I. parental experience with the dengue vaccine reveals that prior immunization experience, perceptions of government programs, cultural factors, and economic factors contribute significantly to immunization attitudes.

(a) Influence of Past Vaccine Experiences

Parental confidence in the dengue vaccine limited from their previous experience with government vaccination initiatives. Previous vaccination experiences had a positive influence and encouraged more parents to consent to the dengue vaccine. Experienced or victimized parents were hesitant, though. Perceived similarity with other government-financed vaccines also guided decision-making in some instances and led to assumptions about its safety and effectiveness. Valido et al. (2018) highlighted that the acceptance of the dengue vaccine by parents was highly associated with their past experiences with dengue and immunization programs. Positive past experiences concerning vaccinations had a high acceptance rate, while negative reactions or negative past experiences led to hesitation.

(b) Barriers to Acceptance

Vaccine hesitancy for dengue was largely driven by misinformation, fear, and misunderstanding. Controversy surrounding the vaccine propagated, including the Dengvaxia scare, that greatly impacted trust, especially in remote areas where misinformation spread quickly. Religious and cultural beliefs also came into play, with some parents opting for herbal medication due to past concerns over side effects from regular vaccinations.

In Puerto Rico, it was revealed in a survey that there were excessive concerns about side effects and vaccine distrust overall among anxious parents. In addition, a lack of more information on the vaccine was cited as a significant issue (Rodriguez et al., 2023).

Moreover, in Indonesia, a study revealed that both health workers and members of the public had relatively low knowledge scores and attitude scores on the dengue vaccine and therefore were anxious about vaccination (Wahab et al., 2024).

(c) Determinants of Acceptance

The severity of past dengue histories also determined vaccine acceptance. Parents whose child or who was severely hospitalized because of dengue favored vaccination. Parents whose children experienced mild cases of dengue, however, were reluctant. Furthermore, past government credibility issues, particularly regarding how they handled vaccine concerns, influenced parents' willingness to trust immunization programs. Earlier vaccine controversies, such as the Dengvaxia fiasco in the Philippines, have eroded trust in public health institutions, and this has translated into low acceptance of vaccines (Valido et al., 2018).

(d) Economic and Emotional Impact

Financial constraints played a major role in parental choices. Even though free, government-sponsored vaccines were cost-effective, numerous parents who had the means to utilize private health opted to do so, with concerns regarding the dependability of government services playing a role. Psychological distress was a leading cause among parents who initially consented to vaccine but later felt guilt due to hysterical reporting. Fear of safety resulting from vaccination prompted other parents to alter health-seeking behaviors and turn to private health practitioners as a way to reassure themselves.

Parents who had agreed to vaccination in the face of controversies subsequently reported regret and emotional distress, influencing their trust in subsequent vaccination schemes (Valido et al., 2018).

Significant key informants like a municipal health officer, a midwife, and a traditional leader elicited the influence of misinformation, logistical issues, and cultural beliefs in vaccine acceptance. The municipal health officer, for example, mentioned the significant impact of past controversies in terms of parental trust, while the midwife saw that the lateness in vaccine delivery increased uncertainty about the dependability of immunization.

Similarly, the focus group interviews revealed common issues of concern pertaining to vaccine safety, access, and the impact of transparent health education. Mothers with first-hand experience of bad cases of severe dengue were more inclined towards immunization, whereas others recalled earlier ambiguity and fear regarding immunization programs. Openness and open communication as well as people's involvement emerged as most influential determinants in the improvement of vaccine uptake.

Table II. The Religious and Cultural Beliefs in the Targeted Communities affected Parental Acceptance of the Dengue Vaccine.

Main Theme	Sub-Theme	Description
Religious Beliefs and Practices	Perception of Vaccine Ingredients	Issues of vaccine components being in conflict with religious dietary restrictions, such as the use of gelatin of porcine origin, which has raised concerns among Muslim parents.
	Influence of Religious Leaders	Support or criticism from religious leaders having a highly dramatic impact upon community beliefs concerning vaccination. Supportive endorsements have been linked to increased vaccine take-up.
Cultural Beliefs and Practices	Preference for Traditional Medicine influence of Religious Leaders	A cultural inclination towards natural or traditional remedies rather than modern medical interventions, resulting in resistance to the acceptance of vaccinations.
	Community Perceptions and Misinformation	Dispersion of myths and misinformation within the community, e.g., myths that vaccines are harmful or unnecessary, resulting in vaccine hesitancy.
Socioeconomic and Educational Factors	Educational Attainment and Awareness	Lower levels of education correlating with reduced awareness about vaccine benefits and safety, leading to higher hesitancy.
	Economic Status and Healthcare Access	Economic constraints limiting access to healthcare services and information, thereby influencing vaccine acceptance rates.

Table II. Reveals that religious belief and practice play an important role in the acceptance of vaccines, for example, in cases of vaccine components being incompatible with religious dietary needs, e.g., the use of porcine-derived gelatin. Religious objections have been shown to play an important role in vaccine acceptance, particularly in Muslim communities (H. Larson, de Figueiredo, Karafillakis, & Rawal, 2018). Religious leaders also play a significant role, their support or rejection having the potential to influence community attitudes to vaccines. Dubé et al. (2015) highlight that religious support has the ability to counteract vaccine hesitancy and increase public trust in immunization programs.

Both cultural beliefs and practices also determine vaccination decisions, with some groups favoring traditional medicine over modern interventions. According to Leask, Willaby, and Kaufman (2014) vaccine hesitance is typically coupled with strongly held cultural beliefs that support herbal or traditional practices of healing. Furthermore, misinformation and community attitudes are also a great challenge as rumors about vaccines being unsafe or not necessary are rapidly spread in rural communities (Yaqub, Castle-Clarke, Sevdalis, & Chataway, 2014). Misinformation conveyed in communities is likely to generate long-term resistance to immunization efforts, making national health campaigns ineffective.

Socioeconomic and educational factors also determine the acceptance of vaccines. Education level and knowledge related to education significantly contribute to how people perceive vaccines, as less educated populations have less information about the safety and benefits of vaccines (Scheres & Kuszewski, 2019). Parents who are less educated tend to lack the capability to differentiate between science-based facts and myths. Further, access to health services and economic situations determine vaccine selections, since economic constraints limit family households from accessing health facilities (Paterson et al., 2016). Lack of convenient access to health clinics and vaccination suppliers presents logistics, adding inequality to vaccine coverages.

Table III. The Role of Trust in Public Health Institutions in Shaping Parental Attitudes Toward the Dengue Vaccination Program.

Main Theme	Sub-Theme	Description
Trust in Government	Historical Vaccine	Previous vaccine controversies, such as the Dengvaxia scandal, generated skepticism

Health Programs	Controversies	and mistrust of new immunization programs launched by the government. Parents recall past incidents when vaccine rollouts were poorly publicized, generating doubts on safety and effectiveness. One of the key informants from Buldon testified that there was rapid spreading of misinformation about Dengvaxia, especially in remote areas.
	Perception of Government Transparency	Parents' trust also depends on the openness of public health institutions regarding vaccine safety, distribution, and administration. Where information is not transparent or consistent, mistrust increases, and parents do not want to vaccinate their children. Parents in the focus group discussion (FGD) complained about the failure of health officials to provide clear information.
Community Engagement and Communication	Role of Local Health Workers	Parents will be more confident in accepting health workers whom they know directly compared to national government officials. Regular and culturally sensitive health education from local health workers increases the acceptance of vaccines. According to one key informant-a midwife participating in the study, regular interaction with families lowers fears.
	Influence of Community Leaders	Parents' minds are largely swayed by religious and cultural leaders in Maguindanao province. Acceptance is enhanced when they embrace vaccination. Conversely, hesitancy is heightened when these people hesitate. A traditional leader (Datu) said that others previously disliked vaccines and used to employ traditional medicine in its place due to past problems with immunization.
Access to Public Health Services	Vaccine Availability and Distribution	Confidence in parents about immunization programs is affected by how efficiently vaccines are delivered. Delays or shortages contribute to doubts about the ability of the government to manage public health interventions. According to one of the health officers interviewed, logistic problems in rural areas make parents question the validity of immunization programs.
	Past Healthcare Experiences	Past experience of parents with public health institutions, i.e., treatment from hospitals and immunization campaigns, shapes the attitude. People who have had a negative experience with government healthcare services are more likely to be skeptical about the dengue vaccine. FGD participants reported that overcrowded government hospitals and lack of resources made them lose confidence in public healthcare services

Table III. reveals that public trust in institutions of public health is crucial in shaping parental perceptions towards the dengue immunization program, particularly in culturally diverse municipalities of Datu Odin Sinsuat, South Upi, and Buldon of Maguindanao, BARMM. Hesitancy towards vaccine was strongly established by government health program experiences, perceptions of openness, interactions with local health personnel, influence of community leaders, and access to health care, the study has found.

(a) Historical Vaccine Controversies and Government Transparency

One of the primary reasons for vaccine skepticism among parents was the remaining impact of the Dengvaxia scandal. In key informant interviews with health officials, it was discovered that misinformation about Dengvaxia spread very quickly, particularly in rural communities with poor access to accurate health information. A municipal health officer explained that "The Dengvaxia scandal had a lasting impact. The majority of parents still associate new vaccines with fear and skepticism, believing that the state will never tell the truth about vaccine safety." This is highlighted by H. Larson et al. (2018) who point out that earlier vaccine scandals shape enduring public skepticism toward public health institutions.

During the focus group, one of the mothers from South Upi shared her concern, and saying that *"We only hear of vaccines when there is an emergency, but when we ask, we are not given clear answers. It makes me unsafe to allow my children to be vaccinated."* This is in accordance with Solís Arce et al. (2021) who argue that a lack of transparency in vaccine distribution and administration breeds more doubt.

(b) The Role of Local Health Workers and Community Leaders

Despite distrust of national public health facilities, parents trusted local health workers. A midwife in the study noted that face-to-face contact between health workers and parents was key to vaccine uptake, and she emphasized that *"When parents see faces, they trust the message more. But if a city government representative comes and tells them to vaccinate their children, they immediately distrust."* This is in agreement with Dubé et al. (2015) whose opinions are that community-based health education increases vaccine coverage, particularly among hesitant populations**.**

Nonetheless, religious and cultural beliefs were the cause of vaccine hesitancy. A traditional leader opposed that *"Some families use herbal medicine because they think it is safer than vaccines. This is due to previous experiences with side effects from government vaccines."* The same trend was observed by Leask et al. (2014) who found that religious and cultural beliefs were major factors in vaccine choice among marginalized groups.

(c) Healthcare Access and Vaccine Distribution

The second major concern was the availability and accessibility of vaccines. A municipal health officer explained that late delivery of vaccines in remote areas gave rise to the following doubts and she said that *"When the parents see that the vaccines are not always available or the vaccine is delayed, they begin to question whether the government can be trusted to administer such programs effectively."* This is supported by Rodriguez et al. (2023) who found that poor vaccine delivery erodes trust in immunization programs

The parents in the FGD also grieved public healthcare units. In the words of one parent says that *"Government hospitals are always full, and sometimes there is not enough medicine. If they cannot even provide enough medicine, how can we trust them with vaccines?"* Bedford et al. (2018) argue that previous negative experiences with healthcare services are one of the determinants of vaccine hesitancy because they result in a general distrust of government health interventions.

Table IV. The Role of Communication Strategies in Influencing Parental Perceptions and Decision-Making on Dengue Vaccination

Main Theme	Sub-Theme	Description
	Clarity and Accuracy of Vaccine Information	Parents complained that there was insufficient clear and correct information regarding the dengue vaccine. The majority of parents did not understand if the vaccine was effective, what its side effects were, or if it was actually necessary. A municipal health officer claimed that rampant misinformation and discrepancies in how the health workers explained the vaccine existed among parents.
	Accessibility of	Parents in remote areas struggled to

Effectiveness of Information Dissemination	Health Communication	access reliable vaccine information. Some relied on second-hand information from community members rather than official sources. One of the midwives in the study noted that parents in geographically isolated communities did not have easy access to health education programs.
Trust in Messengers and Communication Channels	Role of Local Health Workers in Communication	Parents trusted the local health workers more than government officials. A municipal health officer said that vaccine hesitancy decreased when health workers personally gave the explanation of the benefits of the vaccine. One FGD mother stated: *"If it is explained to me by the midwife I know, I believe that the vaccine is safe. But if a representative of the municipality government comes, I will not trust him."*
	Influence of social media and Community Discussions	Social media contributed heavily to vaccine attitudes. Some parents were discouraged by false information spread on the internet. A community leader (Datu) explained that parents in his community used to discuss concerns about vaccines during casual socialization, where unverified information was easily disseminated.
Cultural and Linguistic Barriers in Communication	Language and Cultural Sensitivity	Parents were finding it hard to understand vaccine information when it was not both in their home language and in line with their cultural belief. One of the study's midwives indicated that making use of examples that the community used culturally increased acceptance. One Teduray mother in the FGD stated: *"If the government really wants us to know, they should use a language which we understood."*
	Religious Perspectives on Vaccine Information	Some parents were reluctant because they felt the vaccine was not compatible with their religion. One religious leader interviewed said that vaccine information campaigns must include religious leaders to make it more acceptable.

Table IV reveals that parental beliefs and dengue vaccine choice are substantially influenced by the delivery of vaccine information. Parents in Maguindanao municipalities of Datu Odin Sinsuat, South Upi, and Buldon were shaped by the capacity of health messages to effectively convey, credibility of messengers, social network determinants, and culture.

Among the salient issues of concern that were raised by the parents were inconsistency and vagueness in the messages about the vaccines. Some parents in the focus group discussion (FGD) reported being confused with the need, effectiveness, and side effects of the dengue vaccine. A municipal health officer said in an interview that *"the biggest problem we have is the spread of misinformation. There are parents who believe the vaccine is unsafe based on past controversy, and there are others who believe it is just another regular injection without having an idea of how it operates."* This finding is consistent with a study conducted by H. Larson et al. (2018) which found that vaccine misinformation contributes to hesitancy, particularly when past public health catastrophes have affected trust in vaccination programs.

In the rural areas, information gaps were even more pronounced. A midwife in South Upi commented, saying that *"Parents don't always get their vaccine information from health workers. They learn from neighbors, relatives, and sometimes from social media. That's where a lot of the misconceptions are coming from."* Dubé et al. (2015) point out that in low-resource settings, the lack of accessible health education means relying on informal sources, which can be unreliable.

Further, trust in the messenger was a significant factor in vaccine acceptance. Parents tended to trust local health workers more than the government or the internet. A municipal health officer emphasized that *"If a parent knows and trusts their barangay health worker, they are more likely to believe what they say about the vaccine."*

This finding aligns with Dubé et al. (2015) who determined that interpersonal relationships among health workers and parents build vaccine confidence.

However, social media and community discussions also played a major role. A traditional leader (Datu) interviewed noted that *"Parents speak to parents. If the mother says something negative or if she heard some negative thing from the internet concerning the vaccine, others also trust it."* As per Wahab et al. (2024) highlighted that there is the social network effect for the spread of accurate and inaccuracy vaccine news.

Many parents struggled to understand vaccine messages when they were not presented in their local language or cultural context. A Teduray mother during the FGD was irritated saying that *"Government officials visit and speak to us in a language we do not fully understand. If they want to instruct us, they should speak in our language and tradition."*

A midwife raised that culturally relevant messaging improved vaccine acceptance *"If we discuss vaccines in terms that are meaningful to them, parents will hear us. If we speak only in technical terms, they tune us out."* Wahab et al. (2024) emphasize that culturally responsive communication strategies are essential within multicultural societies to promote understanding and acceptance.

Religious beliefs also influenced the manner in which parents heard vaccine messages. One of the religious leaders interviewed suggested health campaigns target faith leaders saying that *"some parents refused the vaccine on the grounds that it was against their religion. More families would listen if there were cooperation with religious leaders."* Bedford et al. (2018) note that having religious leaders incorporated into vaccine messages increases trust and acceptance.

The study showed that vaccine communication interventions had a substantial impact on parents' decision-making. Parents in Maguindanao more readily accepted vaccines when they were explained simply and at a culturally appropriate level by credible health workers. Misinformation, lack of availability, and language barriers hindered acceptance of vaccines. Public health initiatives should address clear and culturally appropriate communication and employ local health workers and community leaders for effective delivery of accurate information for the trust in vaccines to be increased.

Table V. Factors Influencing Vaccine Hesitancy Post-Dengvaxia Controversy

Main Theme	Sub-Theme	Description
Religious and Cultural Beliefs	Personal and Community Experiences	Concerns over the vaccine containing ingredients that conflict with religious dietary laws, such as porcine-derived gelatin.
	Personal and Community Experiences	Strong influence of local religious leaders on community decisions regarding vaccination, shaping acceptance or rejection.
Misinformation and Public Trust	Impact of the Dengvaxia Controversy	The Dengvaxia controversy led to widespread fear, causing distrust in government immunization programs and pharmaceutical companies.
	Spread of Misinformation	Misinformation about vaccine risks circulated via social media and community discussions, reinforcing vaccine hesitancy.
Socioeconomic and Educational Factors	Educational Attainment and Health Literacy	Lower education levels led to difficulty in understanding vaccine-related risks and benefits, making parents susceptible to misinformation.
	Economic Barriers and Healthcare Access	Limited healthcare access and financial constraints made parents hesitant, fearing hidden costs or complications.
Personal and	Negative	Parents who perceived or experienced

Community Experiences	Experiences with Past Vaccines	adverse effects from previous vaccines were more likely to refuse the dengue vaccine.
	Community Influence and Peer Experiences	Parents relied on shared community experiences in making vaccine decisions, with peer influence playing a critical role.

Table V reveals that religious beliefs were also a major factor in vaccine hesitancy, particularly among the Iranun and Maguindanaon Muslim community. A few interviewees were apprehensive about the presence of porcine-derived gelatin in the vaccines, as they believed this was contrary to Islamic dietary laws. A South Upi mother who did not take the dengue vaccine said *that "We are not certain if the vaccine has haram ingredients. Our religious leaders have not assured us that it is safe."*

The influence of religious leaders was yet another strong contributory factor. Parents presented with reassuring endorsement from religious leaders were more likely to accept the vaccine, but parents who were put under interrogation or negative religious attitudes refused to do so. This corroborates findings by H. Larson et al. (2018) which demonstrated that religious leaders wield a strong persuasion in influencing attitudes towards the vaccine among religion-based communities.

The scandal surrounding Dengvaxia severely undermined faith in vaccines. One mother from Buldon who was not vaccinated remembered that *"I heard that children died after taking Dengvaxia. How do we trust another vaccine when we do not even know if it is safe?"* This aligns with research conducted by Leask et al. (2014) which found that vaccine scandals may lead to the long-term decline in immunization rates due to elevated parental worries.

Second, false information spread rapidly through social media, radio programs, and word of mouth, fueling vaccine doubt. Parents had commonly cited Facebook and neighborhood conversations in their communities as sources of ominous claims such as inducing sterility or chronic illness. Yaqub et al. (2014) noted that information spreads more easily in low-resource settings where there is less health education, and people are thus more susceptible to fear-driven narratives.

Most of the parents who did not agree to the vaccine had low levels of education, thus were susceptible to misinformation. One parent who agreed to the vaccine said that *"I learned why vaccines are used, so I was not scared. But other parents here lack good information."* This is confirmed by the research of Paterson et al. (2016) which explained that higher educational levels are directly associated with better vaccine uptake, as education assists people in checking information based on reliable sources.

Economic constraints also influenced the vaccination decisions. Some feared extra invisible charges, while others lacked means to access the healthcare centers. One Teduray mother of South Upi said "*We have to travel a far distance to receive vaccines. What do we do if my child gets side effects? How do we treat them?"* This aligns with Rodriguez et al. (2023) findings that economic limitations result in lower immunization coverage in rural areas.

Negative previous experience with vaccines was a significant reason for refusal. Mothers recalled having fever or pain after previous vaccinations and feared side effects. One mother from Datu Odin Sinsuat who refused the vaccine explained that *"My neighbor's child had a high fever after the last vaccination. I don't want to take that risk."*

Moreover, peer pressure in communities influenced vaccine choice. Parents would depend on the experiences of their neighbors more than on medical professionals. A Maguindanaon mother in Buldon remarked that "If other parents don't want it, I also won't want it. We all want to guard our children." This corroborates Leask et al. (2014) findings, where they stressed that social processes strongly impact vaccine acceptance, especially among tight-knit communities.

Summary of major findings:

1. Parental Experiences with Vaccination
    - ➢ Parents with positive experiences with previous vaccines were more likely to accept the dengue vaccine.
    - ➢ Parents who had negative past experiences, like side effects or false information, were reluctant.
    - ➢ Some parents compared the dengue vaccine with routine vaccinations and so had certain expectations and confidence.
2. Religious and Cultural Beliefs

- ➢ Dread of vaccine ingredients (e.g., porcine-derived gelatin) made Muslims reluctant.
- ➢ Cultural beliefs and traditional medicine motivated some parents to use herbal medicine in place of vaccination.
- ➢ Religious leaders played a key role in shaping attitudes within communities, encouraging or discouraging vaccination.

3. Trust in Public Health Institutions
    - ➢ The Dengvaxia controversy severely eroded faith in government-sponsored vaccination programs.
    - ➢ Parents were wary of government transparency and integrity in the conduct of immunization campaigns.
    - ➢ Local health workers were trusted more than national government personnel.
4. Communication Strategies and Media Influence
    - ➢ Inadequate communication and mixed messages were factors that hampered vaccine acceptance.
    - ➢ Misinformation by word of mouth and on social media kindled concerns over vaccine safety.
    - ➢ Parents were more likely to accept information about vaccines presented by familiar local health professionals in a local language.
5. Economic and Accessibility Barriers
    - ➢ There were some parents without access to quality healthcare units, thereby complicating vaccine uptake.
    - ➢ Fear of extra expenses related to side effects of vaccines and economic limitations contributed to decisions.
    - ➢ Vaccine delays and logistics issues eroded trust in immunization campaigns.

Conclusions

On the basis of the findings of the study, the following conclusions are formulated:

1. Vaccine hesitancy in Maguindanao has its roots in historical experience, religious belief, and institutional trust. The Dengvaxia controversy created long-term fears that persist due to misinformation and poor government communication.
2. Parental perceptions of vaccination are shaped by both community influence and media exposure, and therefore health communication strategies targeting specific areas are required to re-establish trust.
3. Socioeconomic determinants, including healthcare access and economic concerns, are significant influences on vaccine selection.
4. Local leaders and religious leaders' engagement in promoting the vaccine is key to increasing vaccination coverage.

Recommendations

Based on the conclusions formulated, the following recommendations are made:

1. Increase Community-Based Education
    - ➢ Launch culturally personalized education campaigns through trusted local sources such as barangay health workers and religious leaders.
    - ➢ Employ storytelling, visual media, and interactive workshops in local languages to counter myths.
2. Rebuild Trust in Public Health Institutions
    - ➢ Increase transparency of vaccine policy and deliver clear messaging about vaccine safety and effectiveness.
    - ➢ Establish channels whereby parents can have direct communication with health workers to assuage their anxieties.
3. Improve Communication Strategies
    - ➢ Establish a multi-channel approach with community radio, social media, and direct community outreach.
    - ➢ Retrain vaccine messages to be presented in terms of its life-saving potential and not just as an advertising of government requirement.
4. Engage Religious and Cultural Leaders
    - ➢ Collaborate with imams, datus, and elderly members of communities to encourage immunization.
    - ➢ Address religious concerns by ensuring vaccines are compliant with Islamic dietary laws.
5. Expand Healthcare Access
    - ➢ Streamline and modernize vaccine distribution logistics to offer timely access in remote locations.

- Provide additional resources and training to community health workers to better explain the benefits of vaccines and alleviate fears.

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