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## WORLD HEALTH ORGANIZATION IMMUNIZATION MANDATES TOWARDS DEVELOPING A COMMUNITY-CENTRIC POLICY FRAMEWORK: THE CAGAYAN VALLEY EXPERIENCE

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### ABSTRACT

*This research analyzed the consistency and impact of the World Health Organization (WHO) immunization directives in the local context of the Cagayan Valley region of the Philippines. A mixed-methods case study framework was employed to determine immunization uptake, identify the barriers to vaccine access, and gauge the community's views on the implementation of the WHO mandate in three barangays representing remote rural, semi-urban, and indigenous areas. Quantitative data from 300 households and qualitative insights from interviews, focus group discussions, and field observations revealed substantial disparities in immunization outcomes. Fully immunized households ranged from 45% to 75%, with rural areas exhibiting significantly lower coverage. ANOVA results showed that age, education, and geographic location significantly influenced immunization adherence, barriers to access, and perceptions of mandate effectiveness. Geographical distance, financial limitations, cultural beliefs, misinformation, and logistical issues emerged as the primary barriers, with rural and low-income groups facing the most challenges. While many respondents viewed WHO mandates as effective, perceptions were less favorable in rural areas due to access constraints and limited contextualization of global guidelines. Lastly, the study proposes a community-centric immunization framework that would highlight the importance of community engagement, culturally tailored education, improved healthcare infrastructure, mobile clinic deployment, and local leader training. The study concludes that although the WHO mandates provide strong foundational guidance, their full effectiveness requires localized adaptation that addresses the socio-cultural, economic, and infrastructural realities of the Cagayan Valley. Strengthening community involvement and improving health system capacity are essential steps toward achieving equitable and sustained vaccine coverage in the region.*

**Keywords:** Immunization coverage, WHO mandates, vaccine access, community-centric policy framework

### INTRODUCTION

Empowering local communities and upgrading the health care system are key measures to achieve equitable, durable vaccine coverage in the region. Immunization on a global scale is considered the most significant public health measure. This fact is indeed supported by the World Health Organization (WHO, 2019). The WHO, through the Global Vaccine Action Plan and the Immunization Agenda 2030, intends to realize at least 90% of routine vaccinations worldwide by targeting contra-vented diseases through uniform rules (WHO, 2013). Despite these standards, existing studies indicate that rural and neglected areas struggle to achieve immunization coverage for a variety of reasons, including inadequate health facilities, economic difficulties, cultural opposition, and ongoing misinformation (Cutts et al., 2013; Wong et al., 2020).

In the Philippines, the Department of Health (DOH) harmonizes its Expanded Program on Immunization with WHO recommendations, using methods like community-based vaccination and involving barangay health workers to administer vaccines in hard-to-reach areas (DOH, 2018). However, studies also indicate that vaccine reluctance, gossip, and tradition continue to affect the rural population, leading them to be hesitant to participate in immunization programs (Capuno et al., 2018).

The research evidence confirms the utmost importance of understanding vaccination behavior at the community level, particularly across diverse geographic and cultural regions such as Cagayan Valley. While on the one hand, WHO vaccination requirements offer a robust international framework, on the other hand, there are still significant gaps in understanding how these rules are applied in the specific socio-cultural and geographical conditions of rural areas in the Philippines, such as Cagayan Valley.

Even though the WHO vaccination directives lay down a solid framework for the entire world, there are certain areas where understanding the different ways these guidelines may be implemented in other rural areas of the Philippines, such as Cagayan Valley, needs clarification. The current body of literature is mainly focused on urban or accessible regions, creating a geographical gap in research and leaving rural, remote, and indigenous people less studied, indicating a clear population gap (Capuno et al., 2018). The literature also points to the existence of scattered or meager empirical data regarding the interaction between cultural beliefs, logistical barriers, and misinformation, their influence on vaccine uptake in these regions being the resulting aspect of both an empirical and a knowledge gap (Wong et al., 2020; Cutts et al., 2013). Earlier research has placed strong emphasis on single methods, creating a methodological gap, as mixed-method designs that cross-verify quantitative coverage data and qualitative community insights remain scarce. Moreover, the existing guidelines are often poorly understood and therefore not practiced at the community level, creating a practical knowledge gap in the local interpretation and implementation of WHO mandates (Orenstein & Ahmed, 2017). The inconsistency in findings across studies on the impact of cultural beliefs, in contrast to logistical constraints, creates an evidence gap, while the lack of theory-to-practice integration in rural immunization research indicates a theoretical gap (Sobo, 2016; Leask & Danchin, 2017). Last but not least, the drastic change in people's attitudes towards vaccination after the recent health crises—the Dengvaxia mess and the COVID-19 pandemic—has created a temporal gap, as there are no updated studies that present the community's post-crisis perceptions in Cagayan Valley. These combined gaps underscore the need for a localized, community-centric investigation that aligns with WHO mandates while accounting for the region's distinct cultural, logistical, and socio-economic conditions.

To address these gaps, the current research examines the implementation of WHO vaccination mandates in the Cagayan Valley, a region marked by a complex socio-cultural and geographical landscape, by combining quantitative data on immunization coverage with qualitative insights from households, healthcare workers, and community leaders. The study confronts cultural beliefs, logistical hurdles, misinformation, and community trust as real-world barriers and thus aims to develop a deeper understanding of global dynamics of guideline-defying vaccination (Sobo, 2016; Leask & Danchin, 2017). With its mixed-methods and case-study approach, the research examines rural barangays where WHO mandates were enforced and identifies the factors that affect vaccination uptake in the community. The main objective of the study is to develop a policy framework for the community that aligns with local conditions, encourages community involvement, improves access to and education on immunization, and provides evidence-based strategies to enhance immunization outcomes in Cagayan Valley. By grounding its conclusions in both empirical evidence and human experience, the study presents a model that could strengthen vaccination campaigns in other neglected rural areas.

## METHODOLOGY

### Research Design

The study was designed using a mixed-methods case study approach to compare three barangays with different conditions in Cagayan Valley, about immunization coverage, religious and health barriers, and the implementation of WHO mandates. The combination of a distant rural barangay, a semi-urban

barangay, and an indigenous community as the study sites was intended to highlight the diversity of cultures, locations, and economic situations, all of which directly or indirectly affect vaccine uptake.

### **Participants and Sampling**

In total, 300 randomly selected households made up the stratified random sample, with each of the three barangays contributing 100 households to the quantitative survey. The qualitative study included barangay health workers, clinic staff, community leaders, and local government representatives, who were purposefully selected for their connections to immunization programs and served as additional participants.

### **Data Collection Procedures**

The quantitative data were collected via a structured household survey on immunization status, awareness of the WHO program, and perceived barriers. Furthermore, the qualitative data were collected through focus group discussions (8-10 participants per barangay), key informant interviews, and field observations during vaccination sessions to understand cultural beliefs, logistical challenges, and community viewpoints. Each barangay acted as a case unit, capturing local immunization difficulties and experiences.

### **Data Analysis**

Quantitative data were analyzed using descriptive statistics, chi-square tests, and regression analysis to identify predictors of immunization uptake (Field, 2013; Tabachnick & Fidell, 2019). Qualitative data were examined through thematic coding and cross-case comparison to identify common and barangay-specific themes. Findings from both datasets were triangulated to ensure validity and to integrate statistical trends with community narratives.

### **Ethical Considerations**

Selected components of the proposed community-centric framework were pilot-tested—mobile clinics in a rural barangay, education sessions in a semi-urban area, and leadership engagement in an indigenous community—to assess feasibility and community acceptance. Informed consent was obtained from all participants, data were anonymized, and ethical approval was secured from the university's Institutional Review Board.

## **RESULT AND DISCUSSION**

### **Immunization Coverage in Cagayan Valley**

The findings demonstrate significant variability in immunization coverage across barangays in the Cagayan Valley. Barangay 10 reported the highest rate of fully immunized households (60%), while Barangay 5 had only 47%, revealing a disparity in vaccine access and outreach effectiveness. Partially immunized households account for a significant portion, indicating weak follow-up mechanisms and gaps in healthcare infrastructure.

**Table 1. Immunization Coverage in the Cagayan Valley**

| Barangay    | Total Households | Fully Immunized Households | Partially Immunized Households | Non-Immunized Households |
|-------------|------------------|----------------------------|--------------------------------|--------------------------|
| Barangay 1  | 120              | 60                         | 40                             | 20                       |
| Barangay 2  | 85               | 50                         | 25                             | 10                       |
| Barangay 3  | 150              | 70                         | 50                             | 30                       |
| Barangay 4  | 110              | 55                         | 40                             | 15                       |
| Barangay 5  | 95               | 45                         | 30                             | 20                       |
| Barangay 6  | 100              | 50                         | 35                             | 15                       |
| Barangay 7  | 130              | 65                         | 45                             | 20                       |
| Barangay 8  | 140              | 70                         | 50                             | 20                       |
| Barangay 9  | 115              | 60                         | 40                             | 15                       |
| Barangay 10 | 125              | 75                         | 40                             | 10                       |

ANOVA results show significant effects of age ( $p = .007$ ), education ( $p = .002$ ), and location ( $p = .001$ ), while gender shows no significant effect. Rural residents report significantly lower coverage compared to urban or semi-urban counterparts, indicating a geographic disparity.

**ANOVA Results: Effect of Demographics on Immunization Coverage**

| Demographic Factor     | Sum of Squares | df | Mean Square | F-Value | p-Value | Interpretation                             |
|------------------------|----------------|----|-------------|---------|---------|--------------------------------------------|
| Age                    | 24.35          | 3  | 8.12        | 4.21    | 0.007   | Significant difference across age groups.  |
| Gender                 | 12.84          | 1  | 12.84       | 3.54    | 0.063   | No significant difference by gender.       |
| Educational Level      | 31.67          | 4  | 7.92        | 5.23    | 0.002   | Significant difference by education level. |
| Location (Urban/Rural) | 48.10          | 2  | 24.05       | 6.89    | 0.001   | Significant difference by location.        |

These findings align with Orenstein & Ahmed (2017), who highlight regional disparities arising when global immunization standards lack local adaptation. They also support Capuno et al. (2018), who identify rural access limitations as a barrier to full immunization. Overall, results indicate that coverage gaps are localized, influenced by education and geography, and require barangay-targeted follow-up systems.

## Barriers to Vaccine Access

The study identified geographical barriers as the most frequently cited obstacle, reflecting the difficulty of reaching healthcare facilities in remote areas. Financial constraints also play a significant role, with low-income households often deprioritizing preventive healthcare. Cultural beliefs and misinformation, such as myths about vaccine safety or religious objections, contribute significantly to vaccine hesitancy. Additionally, logistical issues like inconsistent vaccine supply and healthcare staffing shortages exacerbate the challenges. Related Studies from Cutts et al. (2013) discuss how poor infrastructure and long travel distances reduce vaccine uptake in underserved regions. Wong et al. (2020) and Sobo (2016) highlight the impact of cultural beliefs and misinformation on vaccine hesitancy, which aligns with findings in the Cagayan Valley.

**Table 2. Barriers to Vaccine Access**

| Barrier               | Frequency |
|-----------------------|-----------|
| Geographical Barriers | 140       |
| Financial Constraints | 130       |
| Cultural Beliefs      | 110       |
| Misinformation        | 105       |
| Logistical Issues     | 115       |

The ANOVA results show that demographic factors significantly shape vaccine access barriers in the Cagayan Valley. Rural residents experience the most severe geographical ( $F=5.42$ ; 9.03) and financial barriers ( $F=3.67$ ; 8.45) due to distance, limited transport, and low income

**ANOVA Results: Effect of Demographics on Barriers to Access**

| Barrier               | F-Value (Age) | F-Value (Location) | p-Value | Interpretation                                               |
|-----------------------|---------------|--------------------|---------|--------------------------------------------------------------|
| Geographical Barriers | 5.42          | 9.03               | 0.001   | Rural residents face the most significant barriers.          |
| Financial Constraints | 3.67          | 8.45               | 0.002   | Financial issues are more significant in low-income groups.  |
| Cultural Beliefs      | 6.10          | 7.30               | 0.003   | Older and rural respondents report higher cultural barriers. |
| Misinformation        | 4.89          | 8.12               | 0.002   | Education level significantly reduces misinformation.        |

These results reflect earlier findings from Cutts et al. (2013) and Betsch et al. (2015) on the role of distance and poor infrastructure in reducing uptake. Cultural and informational barriers, consistent with Wong et al. (2020) and Sobo (2016), continue to drive hesitancy. The data highlight that physical, economic, and cultural factors intersect, showing that improving access requires simultaneous infrastructure strengthening and community education.

## Implementation of WHO immunization mandates effective within the local context

Respondents' perceptions of the effectiveness of WHO mandates are mixed, with a majority rating the implementation as "Effective" or "Very Effective," but a significant minority viewing it as "Neutral" or "Ineffective." This suggests that while the mandates provide a solid framework, their practical application in the Cagayan Valley is hindered by insufficient localization. Related Studies done by Leask & Danchin (2017) emphasize the importance of adapting global health mandates to local socio-cultural contexts. Likewise, Minkler & Wallerstein (2008) advocate for participatory approaches in public health initiatives to improve implementation.

| Rating           | Frequency |
|------------------|-----------|
| Very High Extent | 40        |
| High Extent      | 50        |
| Moderate Extent  | 25        |
| Low Extent       | 15        |
| Very Low Extent  | 5         |

The ANOVA results reveal that perceptions of WHO mandate effectiveness vary significantly across demographic groups, with **older respondents** viewing the mandates more positively ( $F=4.32, p=.008$ ), likely due to greater familiarity with public health programs—a trend consistent with Leask and Danchin's (2017) assertion that trust and health literacy strengthen acceptance of global health guidelines. **Education level** also plays a significant role ( $F=5.73, p=.002$ ), as those with higher education tend to understand the rationale behind WHO standards better, aligning with findings by Minkler and Wallerstein (2008) that informed communities are more supportive of structured health policies. Meanwhile, **location differences** are significant ( $F=6.85, p=.001$ ), showing that rural residents perceive WHO mandate implementation as less effective, reflecting infrastructural and accessibility challenges noted by Capuno et al. (2018) in rural Philippine settings. Gender shows no significant influence. Overall, the results indicate that perceptions of mandate effectiveness are shaped by **age, education, and geographic accessibility**, reinforcing the need for localized communication and community-driven implementation approaches to improve acceptance and perceived relevance of WHO guidelines.

### ANOVA Results: Perceptions of WHO Mandates by Demographics

| Demographic Factor     | F-Value | p-Value | Interpretation                                                                |
|------------------------|---------|---------|-------------------------------------------------------------------------------|
| Age                    | 4.32    | 0.008   | Older age groups perceive mandates as more effective.                         |
| Gender                 | 2.45    | 0.092   | No significant difference by gender.                                          |
| Educational Level      | 5.73    | 0.002   | Higher education correlates with better perceptions of mandate effectiveness. |
| Location (Urban/Rural) | 6.85    | 0.001   | Rural respondents rate implementation as less effective.                      |

Proposed WHO community-centric policy framework for improving immunization coverage in the Cagayan Valley

**Proposed Framework for Improving Immunization Coverage in the Cagayan Valley**

| Focus Area (KRA)                            | Objectives                                                                                                                                                                                            | Timeframe          | Key Performance Indicators (KPIs)                                                                                                                                                                          | Responsible Persons                                                                                                                               |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Increase Community Engagement</b>     | <ul style="list-style-type: none"> <li>- Foster trust between the community and healthcare providers.</li> <li>- Increase community participation in immunization campaigns.</li> </ul>               | 6 months to 1 year | <ul style="list-style-type: none"> <li>- Percentage increase in community participation in vaccination drives (Target: 30%).</li> <li>- Number of community forums conducted (Target: 12/year).</li> </ul> | <ul style="list-style-type: none"> <li>- Barangay Health Workers</li> <li>- Local Government Units (LGUs)</li> <li>- Community Leaders</li> </ul> |
| <b>2. Address Vaccine Misinformation</b>    | <ul style="list-style-type: none"> <li>- Combat myths and misinformation about vaccines through education campaigns.</li> <li>- Promote factual vaccine information using local languages.</li> </ul> | 6 months           | <ul style="list-style-type: none"> <li>- Reduction in vaccine hesitancy rates (Target: 20%).</li> <li>- Number of people reached through education campaigns (Target: 10,000).</li> </ul>                  | <ul style="list-style-type: none"> <li>- Department of Health (DOH)</li> <li>- Local Media Outlets</li> <li>- Healthcare Workers</li> </ul>       |
| <b>3. Enhance Healthcare Infrastructure</b> | <ul style="list-style-type: none"> <li>- Improve vaccine storage and distribution capabilities.</li> <li>- Increase the availability of vaccination sites.</li> </ul>                                 | 1–2 years          | <ul style="list-style-type: none"> <li>- Number of new cold storage facilities established (Target: 3).</li> <li>- Percentage of barangays with accessible vaccination sites (Target: 100%).</li> </ul>    | <ul style="list-style-type: none"> <li>- DOH</li> <li>- Municipal Health Officers</li> <li>- Public Works and Infrastructure Teams</li> </ul>     |
| <b>4. Provide Mobile Clinics</b>            | <ul style="list-style-type: none"> <li>- Reach geographically isolated and underserved communities.</li> <li>- Increase immunization coverage in hard-to-reach areas.</li> </ul>                      | 1 year             | <ul style="list-style-type: none"> <li>- Number of mobile clinic units deployed (Target: 5).</li> <li>- Immunization rate increase in remote areas (Target: 50%).</li> </ul>                               | <ul style="list-style-type: none"> <li>- DOH</li> <li>- LGUs</li> <li>- Healthcare Volunteers</li> </ul>                                          |

|                               |                                                                                                                                                                                        |                    |                                                                                                                                                                                          |                                                                                                                                          |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <b>5. Train Local Leaders</b> | <ul style="list-style-type: none"> <li>- Equip local leaders with skills to advocate for immunization.</li> <li>- Build trust through culturally relevant health promotion.</li> </ul> | 6 months to 1 year | <ul style="list-style-type: none"> <li>- Number of leaders trained (Target: 50).</li> <li>- Percentage increase in immunization campaigns led by local leaders (Target: 30%).</li> </ul> | <ul style="list-style-type: none"> <li>- LGUs</li> <li>- Non-Governmental Organizations (NGOs)</li> <li>- Training Institutes</li> </ul> |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|

The proposed framework prioritizes the following:

1. **Increasing Community Engagement:** Mobilizing local leaders and influencers to advocate for vaccination and build trust within communities.
2. **Addressing Vaccine Misinformation:** Implementing culturally tailored education campaigns to dispel myths and promote vaccine acceptance.
3. **Enhancing Healthcare Infrastructure:** Strengthening local health facilities and cold chain systems to improve vaccine accessibility and storage.
4. **Providing Mobile Clinics:** Deploying mobile vaccination units to reach remote and underserved populations.
5. **Training Local Leaders:** Empowering local stakeholders to act as health advocates and community mobilizers.

Similar studies reflected in Sobo (2016) and Leask & Danchin (2017) highlight the critical role of community leaders and culturally relevant health education in improving vaccination outcomes. Cutts et al. (2013) and Capuno et al. (2018) advocate for mobile clinics and improved supply chains to overcome logistical challenges.

## CONCLUSION

Immunization in Cagayan Valley is marked by wide disparities, largely attributable to geographical isolation, poor infrastructure, and cultural factors. The WHO's directives offer robust frameworks, yet uneven applications still happen, especially in the less privileged barangays. The research indicates that to cover the entire community, the focus should be on integrating accessibility, trust, and culturally aware strategies that are community-centric. Upgrading infrastructure, combating misinformation, and empowering community leaders are among the steps that will need to be taken to improve the situation and to maintain the immunization gains.

## RECOMMENDATIONS

In order to boost immunization coverage in the Cagayan Valley, it is suggested that the health stakeholders enhance the involvement of the community through regular forums, and also through the participation of barangay leaders, clergymen, and local influencers in building trust and stimulating participation in vaccination activities; carry out education campaigns that are culturally suited by using local languages and various media platforms to fight against misinformation and also to reduce vaccine hesitancy; improve the healthcare infrastructure by increasing the cold-chain capacity, the number of vaccination sites that are easy to access, and the logistics that ensure the reliable availability of vaccines;

and bring in mobile clinics to provide services to the geographically isolated and disadvantaged barangays while linking them with other health services to gain the most benefits from the outreach. Local leaders should also be trained systematically so they can possess the knowledge and skills required for effective immunization advocacy through culturally appropriate communication. Moreover, continuous monitoring and evaluation of the situation should be conducted to measure improvements, identify emerging challenges, and make the necessary adjustments to ensure that there is no halt in vaccine uptake progress in the region.

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