ORIGINAL ARTICLE

OPEN ACCESS

MEDICA

(International Medical Scientific Journal)
Vol.8, No.10, October 2026, pp. 1157 – 1167
ISSN 2622-660X (Online), ISSN 2622-6596 (Print)
https://doi.org/10.53770/medica.v8i10.1529



Implementation of Measles-Rubella Vaccination Policy in Palu City: A Qualitative Study

Fitri Yanti Usman Heba[1]✉, Syahruddin Hattab[2], Intam Kurnia[2], Ani Susanti[2]

[1] Department of Social Sciences, Doctoral Program in Public Administration, BKU Graduate School, Tandulako University, Palu, Central Sulawesi, Indonesia
[2] Department of Public Administration, Faculty of Social and Political Sciences, Tandulako University, Palu, Central Sulawesi, Indonesia

Article Info

Article History:
Received:
09 September 2026
Revised:
10 Oktober 2026
Accepted:
17 October 2026
Published:
31 October 2026

Keywords:
Measles-Rubella
Vaccination
Policy Implementation
Immunization Program
Qualitative Research

Citation:
Heba, F.Y.U., Hattab, S., Kurnia, I., & Susanti, A. (2026). Implementation of Measles-Rubella Vaccination Policy in Palu City: A Qualitative Study. *MEDICA (International Medical Scientific Journal)*, 8(10), 1157–1167. https://doi.org/10.53770/medica.v8i10.1529

Abstract

Measles-Rubella (MR) immunization is essential for reducing disease burden and achieving herd immunity. Despite strong national policy support, coverage in Indonesia remains uneven due to health system and community-related challenges. This study explored the implementation of the Measles-Rubella vaccination policy in Palu City by examining perspectives of policy actors, health workers, immunization cadres, and parents. A qualitative design was employed, involving in-depth interviews with 20 purposively selected informants across these four groups; data were analyzed thematically and subsequently organized using the Input-Process-Output-Outcome (IPOO) framework. Findings indicated strong alignment between national policy and local implementation, supported by informant-reported adequate resources and structured services through Puskesmas and Posyandu. However, vaccine hesitancy emerged as a major barrier, driven by fear of side effects, misinformation, and social influence. Cadres contributed to community mobilization, while health workers emphasized education and interpersonal communication to increase uptake. Coverage was generally high but unevenly distributed, with localized disparities reflecting clustered acceptance challenges. The MR program in Palu City benefits from strong policy support and adequate system capacity, but its implementation was strongly influenced by community acceptance and effective risk communication. Strengthening behavioral interventions, health communication, and community engagement is essential to achieving equitable coverage and advancing measles-rubella elimination.

COPYRIGHT & LICENSING
Copyright © 2026 MEDICA (International Medical Scientific Journal). Published by Borneo Scientific Publishing.
This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Corresponding Author:

✉ Fitri Yanti Usman Heba
Department of Social Sciences, Doctoral Program in Public Administration, BKU Graduate School, Tandulako University, Palu, Central Sulawesi, Indonesia
Email: fitriyantiusmanheba@gmail.com

1. INTRODUCTION

Health development is an integral part of national development and a fundamental prerequisite for achieving a high-quality, productive, and competitive human resource base (Ho Cong, 2025). Health is not merely defined as the absence of disease but as a state of physical, mental, and social well-being that enables individuals to participate optimally in social and economic life (Schramme, 2023; Wren-Lewis & Alexandrova, 2021). Therefore, health holds a strategic position in the national development agenda.

The state's commitment to fulfilling the right to health is constitutionally mandated in the 1945 Constitution of the Republic of Indonesia and reinforced by Law Number 17 of 2023 on Health, which emphasizes the responsibility of both central and local governments in ensuring accessible, equitable, and high-quality health services. One of the most effective public health interventions to reduce morbidity and mortality, particularly among infants and children, is immunization. Immunization programs are widely recognized as cost-effective interventions that significantly improve maternal and child health outcomes (Stenberg et al., 2021). The success of immunization programs is commonly measured by the Universal Child Immunization (UCI) indicator, which requires at least 80% of infants in each village or urban ward to receive complete basic immunization (Dadari et al., 2023). However, in Central Sulawesi Province, UCI coverage in 2020 only reached 74.1%, which is below the national target of 92%, indicating disparities in immunization coverage across regions.

In addition, the effectiveness of immunization programs is not solely determined by coverage rates but also by the consistency, equity, and sustainability of service delivery (Decouttere et al., 2021). Variations in access to healthcare facilities, differences in community awareness, and disparities in local health system capacity contribute to uneven program outcomes (Khatri et al., 2024). These conditions highlight that achieving high coverage at the aggregate level does not necessarily guarantee uniform protection across all populations, thereby leaving certain groups vulnerable to vaccine-preventable diseases.

In the context of disease control, measles and rubella immunization has become a priority due to the high transmissibility and potential severity of these diseases (Moss et al., 2021). The World Health Organization recommends a minimum immunization coverage of 95% to achieve herd immunity and interrupt disease transmission (World Health Organization, 2024). However, in 2024, measles–rubella immunization coverage in Central Sulawesi Province only reached 80.7%, which remains significantly below the elimination target. At the local level in Palu City, disparities are evident across primary healthcare centers, with several areas still below the recommended threshold, such as Mamboro (63%), Talise (91%), and Sangurara (75%), where measles–rubella cases are still reported.

These conditions indicate a clear gap between policy targets and implementation outcomes. Although immunization policies have been formally established with clear objectives and regulatory support, their implementation continues to face various challenges, including community-related factors, institutional capacity, and resource availability. From a policy implementation perspective, the success of a policy is not only determined by its formulation but also by the interaction between the content of policy and the context of implementation (Bullock et al., 2021). Therefore, this study aims to analyze the implementation of the measles–rubella immunization policy in Palu City and identify the factors influencing its effectiveness in achieving disease elimination targets.

2. METHODS

This study employs a qualitative approach to gain an in-depth understanding of the implementation of the Measles-Rubella (MR) immunization program in Palu City. A descriptive-exploratory design is used to describe current implementation conditions while also exploring the underlying factors that influence both the success and challenges of the program across policy, health service, cadre, and community levels. This approach is appropriate because immunization policy implementation is understood as a complex social process involving interactions among actors, institutional arrangements, resource availability, and socio-cultural dynamics rather than a purely technical intervention. The researcher serves as the primary instrument in interpreting the experiences and perspectives of informants obtained through multiple data sources. The study is conceptually guided by a policy implementation perspective that emphasizes the interaction between policy formulation and the contextual realities of implementation, including organizational capacity, actor involvement, and community behavior. To strengthen the analysis, the study also considers internal factors such as program strengths and weaknesses, as well as external factors such as opportunities and challenges within the implementation environment, allowing for a comprehensive and integrated understanding of how the MR immunization program operates in practice.

This research was conducted in three primary healthcare centers (Puskesmas) in Palu City, Central Sulawesi, namely Mamboro, Talise, and Sangurara. These locations were purposively selected due to their relatively low immunization coverage and the presence of measles–rubella cases, which indicate gaps in policy implementation at the local level. The study was carried out in July 2026. The data collection process was adjusted to the immunization schedules at each research site to ensure that observations and interviews captured the actual implementation processes in real-time.

The informants in this study were selected using purposive sampling to capture a comprehensive, multi-level perspective on the implementation of the Measles–Rubella (MR) immunization program in Palu City. 20 participants included policy-level actors from the local health office and Puskesmas managers, health workers (midwives, and immunization officers) directly involved in immunization service delivery, community health cadres who played a key role in mobilization and community engagement, and parents as recipients of the program representing diverse socio-economic backgrounds. Health workers were included based on at least one year of experience in immunization services, while parents were selected to reflect variation in immunization acceptance and perceptions. Data collection followed the principle of data saturation, continuing until no new significant information emerged across the four informant groups.

Table 1. Definition of informant codes used in the results section.

Code prefix	Informant group/role
DK	Policy-level actor (local health office or Puskesmas management)
BD	Health worker (midwife or immunization officer)
KP	Community health cadre
PJK	Puskesmas program officer

This study utilizes both primary and secondary data sources. Primary data were obtained directly from informants through in-depth interviews, participatory observation, and open-ended qualitative questionnaires, allowing the researcher to capture rich and contextual insights into the implementation process. Secondary data were collected from official reports, previous research, and statistical data to support and contextualize the primary findings.

Data collection in this study employed a qualitative multi-method approach to ensure depth of understanding and methodological triangulation. In-depth interviews were conducted with informants across four levels, including policy actors, health workers (midwives, nurses, and immunization officers), community health cadres, and parents, to explore their experiences, perceptions, and roles in the implementation of the Measles–Rubella (MR) immunization program. Participatory observation was used to directly examine immunization service delivery at Puskesmas and Posyandu, particularly focusing on interactions between health workers, cadres, and the community. In addition, document review was conducted to analyze relevant policy documents, program guidelines, and immunization coverage reports, while focus group discussions were utilized to capture collective community perspectives and to validate emerging findings across stakeholder groups.

Data analysis in this study was conducted using a thematic analysis approach to identify, analyze, and interpret patterns within the qualitative data obtained from in-depth interviews, observations, and document reviews. Data were analyzed thematically and synthesized using an Input–Process–Output–Outcome framework to provide a structured understanding of the relationship between policy, implementation processes, and program outcomes. The analysis process involved systematic steps beginning with familiarization with the data through repeated reading of transcripts, followed by initial coding to organize meaningful units of information. Codes were then grouped into categories and developed into broader themes that reflected key issues related to the implementation of the Measles–Rubella immunization program across policy, health service, cadre, and community levels. These themes were continuously reviewed and refined to ensure consistency and relevance to the research objectives. Finally, the themes were defined and synthesized to construct a comprehensive narrative explanation of the findings, supported by data condensation, data display, and conclusion drawing to ensure that the results were coherent, well-structured, and grounded in empirical evidence. This study was approved by the Research Ethics Committee of Tadulako University under ethical clearance number 88/DST/UN28.12/TU.00.01/2026.

3. RESULTS AND DISCUSSION

National Policy and Health System Resources

The implementation of the Measles–Rubella (MR) immunization program in Palu City is strongly anchored in national immunization policy under the Expanded Program on Immunization (EPI), which mandates MR vaccination as a core strategy for preventing measles transmission and achieving population-level immunity. Across policy actors and health service providers, there is strong consensus that MR immunization is essential for reducing disease severity and preventing outbreaks, even though vaccinated individuals may still experience infection in milder forms.

The program is guided by a national herd immunity target of 95%, which is widely accepted at the policy level as both realistic and necessary.

“The 95% target is realistic because that is what is needed to form herd immunity.” (DK1)

From a resource perspective, the immunization program is supported by relatively adequate financial and logistical systems. Vaccine supply and distribution from central government sources are considered stable and sufficient. Operational funding, including health operational assistance funds, is also reported to adequately support program implementation at the local level.

Human resources are generally available across health facilities, including midwives, nurses, and program managers. However, policy-level informants highlight variability in technical competence, particularly regarding immunization skills and certification. While on-the-job training exists, it is considered insufficient without formal certification, affecting consistency in field implementation.

Implementation at Primary Health Care Level

At the implementation level, MR immunization is delivered through an organized primary healthcare system, primarily via Posyandu (integrated health posts), Puskesmas, and outreach services. Activities are conducted routinely and supported by structured scheduling systems, including monthly Posyandu sessions and targeted immunization campaigns. Coordination mechanisms are well established, involving midwives, immunization officers, health promotion teams, nutrition officers, and cadres. Communication is supported by both formal meetings and informal digital platforms such as WhatsApp groups.

"We already have an integrated team before going to the field—midwives, health promotion officers, and nutrition staff are all included." (BD1)

Micro-planning is used to identify target populations and map immunization coverage gaps, ensuring more targeted service delivery.

At the managerial level, coordination and evaluation are clearly structured, with Puskesmas leadership overseeing scheduling, monitoring, and implementation quality.

Interaction with Communities

Community interaction is a central determinant of program success. Health cadres function as key actors bridging health services and the community, actively mobilizing participation through outreach, home visits, and engagement with local leaders.

"Cadres are the key—they connect the health system with families." (KP3)

Despite strong service availability, community resistance remains the main implementation challenge. Refusal is primarily driven by fear of post-immunization fever, misinformation, and influence from family members, particularly grandparents.

"Many parents refuse because they are afraid the child will get fever after immunization." (BD1)

Post-COVID-19 misinformation, particularly through social media, has intensified vaccine hesitancy in some areas.

"Since COVID, anti-vaccine information spread through social media has influenced people's thinking." (KP1)

To address this, implementation strategies emphasize education, persuasion, and communication rather than coercion. Health workers provide counseling before and after immunization, while community leaders such as RT/RW and religious figures support mobilization.

Importantly, service delivery is increasingly adapted to local contexts. Some policy actors highlight the need for flexible scheduling aligned with community work patterns, rather than fixed morning sessions.

"We should adjust immunization schedules to match community availability." (PJK1)

Immunization Coverage Achievement

At the output level, MR immunization coverage in Palu City is generally high but not evenly distributed. Of 14 Puskesmas, 11 have achieved or exceeded the 95% target, while 3 remain below the threshold due to localized barriers. Coverage gaps are not systemic but clustered, often linked to specific villages or sub-districts where refusal, parental work schedules, or household-level decision-making constraints are present. Key barriers include the following:

1. Working parents unavailable during service hours.
2. Localized refusal clusters.
3. Influence of family elders in decision-making.
4. Limited alignment between service schedules and community routines.

"In some areas, parents are working during the day, so morning services are not effective." (PJK1)

These findings indicate that while service availability is strong, equitable coverage remains a challenge due to behavioral and social factors rather than supply constraints.

Toward Measles-Rubella Elimination

At the outcome level, MR immunization in Palu City has contributed to improved child health outcomes, particularly in reducing the severity of measles infections among vaccinated children. Health workers consistently report that vaccinated children experience milder symptoms compared to unvaccinated children.

"Children who are vaccinated do not experience severe symptoms." (BD1)

Despite these positive effects, full elimination of measles and rubella has not yet been achieved. Remaining transmission risks are associated with incomplete coverage in certain geographic and social clusters.

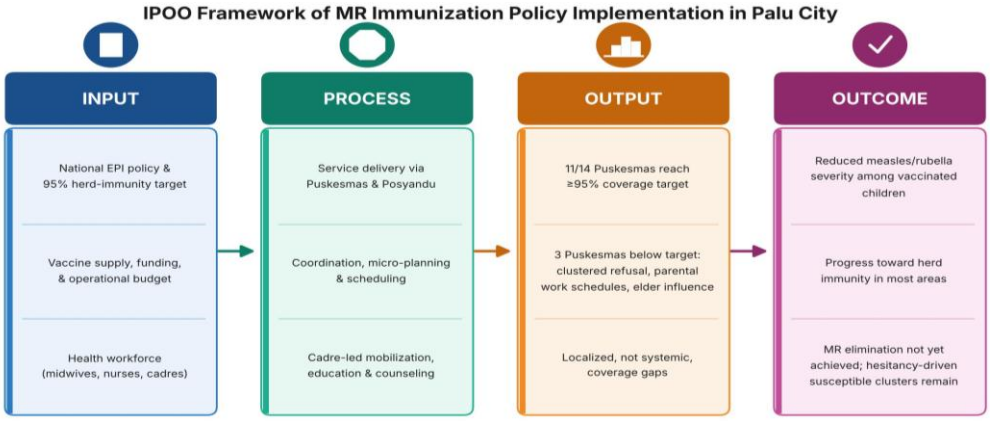


Figure 1. Input-Process-Output-Outcome (IPOO) framework synthesizing the study findings on MR immunization policy implementation in Palu City.

The findings demonstrate that while the MR immunization program is strongly supported at the policy and service delivery levels, its effectiveness is ultimately constrained by behavioral and social determinants at the community level. This section interprets the findings, integrates them with existing public health literature, and proposes an explanatory framework for understanding immunization implementation in similar contexts.

Policy Commitment and System Readiness

At the input level, the findings show strong alignment between national immunization policy and local implementation. The MR vaccination program is fully embedded within Indonesia's Expanded Program on Immunization (EPI), with a widely accepted 95% coverage target as the threshold for herd immunity. This reflects high institutional coherence and policy legitimacy, consistent with global immunization governance frameworks promoted by WHO (World Health Organization, United Nations Children's Fund, & Gavi, 2023). Strong policy alignment and clear immunization targets are critical enablers of program performance. Prior research also indicates that well-established national immunization frameworks contribute to consistency in implementation across different levels of the health system (Micek et al., 2022; Scott et al., 2025). However, other studies emphasize that strong policy design alone is insufficient without effective translation into community-level acceptance and engagement.

From a health system perspective, resources-including vaccines, funding, and human resources are generally adequate (Hanney et al., 2022; Patel et al., 2023). This suggests that implementation barriers are not primarily driven by structural shortages, but rather by downstream system translation challenges. However, a key gap is identified in human resource capacity, particularly the uneven distribution of training and certification among frontline providers. This finding supports existing evidence that immunization program performance depends not only on resource availability but also on workforce competency and continuous professional development. Thus, while the policy environment in Palu is strong and enabling, it does not automatically translate into high and uniform coverage outcomes.

Implementation Process

At the process level, MR immunization is implemented through a structured primary healthcare system involving Puskesmas, Posyandu, and integrated community outreach activities. Coordination mechanisms are well established, including routine scheduling, hierarchical decision-making, and digital communication platforms. This reflects a relatively mature implementation infrastructure. However, a key finding is the central role of health cadres as mediators between the health system and the community. Cadres function not only as implementers but also as trust brokers, social mobilizers, and information transmitters. Their role in conducting home visits and identifying unvaccinated children highlights the importance of community-based micro-level implementation strategies.

Despite this structured system, implementation effectiveness is highly dependent on community interaction. Across all levels, parental refusal and hesitancy emerge as the most persistent barrier. Importantly, refusal is not primarily driven by structural access issues but by perceptions of vaccine safety, fear of side effects, and exposure to misinformation (Uğrak et al., 2025). This finding is consistent with the Health Belief Model, where perceived risk and perceived barriers strongly influence preventive health behavior (Restivo et al., 2023).

The post-COVID-19 context further intensifies this challenge, as social media becomes a dominant channel for misinformation, weakening trust in formal health communication channels. This indicates a shift in the determinants of immunization uptake from access-based to trust-based barriers. Despite relatively strong implementation systems, immunization coverage remains uneven across Puskesmas. While most areas achieve or approach the 95% target, certain localized clusters remain below the threshold due to persistent refusal and context-specific barriers. This pattern suggests that immunization coverage is no longer primarily constrained by service availability but by heterogeneous community acceptance. In other words, coverage gaps are geographically and socially clustered rather than system-wide. This finding aligns with recent global evidence that “last-mile” immunization challenges are primarily behavioral and socio-cultural rather than logistical, consistent with qualitative findings from a comparable immunization setting (Paul et al., 2022).

Importantly, even when physical access is available, acceptance is not guaranteed. This decoupling between access and uptake highlights the limits of supply-side health system strengthening in achieving universal immunization coverage. At the outcome level, the MR immunization program in Palu shows partial success in reducing disease severity and improving coverage trends. Health workers report fewer severe cases among vaccinated children, indicating the protective effect of immunization even in the presence of incomplete coverage. However, full elimination of measles and rubella remains unrealized. Persistent immunity gaps due to vaccine hesitancy create susceptible population clusters, which may sustain transmission risk. This finding is consistent with epidemiological theory that herd immunity requires uniformly high coverage across all sub-populations, not only aggregated averages (Angelov et al., 2024). Therefore, while the program demonstrates progress toward disease control, elimination remains dependent on addressing behavioral determinants of vaccine uptake.

The findings of this study reinforce and extend existing literature on immunization systems in low- and middle-income settings (Khatiwada et al., 2023). Traditionally, immunization programs have been conceptualized as supply-driven interventions dependent on logistics, staffing, and infrastructure (Bvuchete et al., 2022). However, this study demonstrates that in Palu City, supply-side readiness is no longer the primary limiting factor. Instead, the dominant constraint lies in demand-side behavioral dynamics, including trust, perception, misinformation, and social influence. This shift aligns with contemporary global health literature emphasizing the importance of “vaccine confidence” and “social determinants of immunization” (Dwyer et al., 2025). Furthermore, the critical role of cadres and community leaders highlights the importance of social capital in health system performance. Trust is not only built through biomedical knowledge but through relational networks embedded in local communities.

This study has several limitations that should be considered when interpreting the findings. The qualitative design and relatively limited number of informants may restrict the generalizability of the results to other settings. In addition, the study relies on self-reported data, which may be subject to social desirability bias, particularly in discussions related to immunization acceptance. Future research incorporating quantitative approaches or mixed methods could provide a more comprehensive understanding of immunization dynamics and strengthen the external validity of these findings.

4. CONCLUSION

In conclusion, the MR immunization program in Palu City demonstrates strong policy support and effective service delivery structures, but its success is constrained by behavioral and social factors at the community level. The findings indicate a transition in

immunization challenges from infrastructural limitations to trust and communication barriers. Achieving MR elimination will therefore require not only sustaining technical and logistical capacity, but also strengthening behavioral interventions, improving risk communication, and enhancing community trust through culturally sensitive and locally embedded strategies.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ETHICAL CONSIDERATIONS

This study was approved by the Research Ethics Committee of Tadulako University under ethical clearance number 88/DST/UN28.12/TU.00.01/2026. Written informed consent was obtained from all participants before data collection. All procedures were conducted in accordance with the ethical principles of the Declaration of Helsinki.

AUTHOR CONTRIBUTIONS

Fitri Yanti Usman Heba contributed to conceptualization, methodology, investigation, formal analysis, and writing. Syahruddin Hattab contributed to methodology, supervision, validation, and writing. Intam Kurnia contributed to investigation, formal analysis, validation, and writing. Ani Susanti contributed to supervision, validation, and writing. All authors reviewed and approved the final manuscript.

ACKNOWLEDGEMENT

The authors would like to express their sincere gratitude to the Palu City Health Office for its support and assistance throughout the implementation of this study. The authors also acknowledge the support of the Doctoral Program in Social Sciences, Public Administration Concentration, Postgraduate Program, Universitas Tadulako, and the Public Administration Study Program, Faculty of Social and Political Sciences, Universitas Tadulako, Palu, Central Sulawesi, Indonesia.

FUNDING

This research received no external funding.

DECLARATION OF ARTIFICIAL INTELLIGENCE USE

The authors used artificial intelligence (AI) tools solely to assist with language editing, grammar correction, and improvement of English writing. All content, interpretations, analyses, and conclusions were reviewed and verified by the authors, who remain fully responsible for the final manuscript.

REFERENCES

Angelov, G., Kovacevic, R., Stilianakis, N. I., & Veliov, V. M. (2024). An immuno-epidemiological model with waning immunity after infection or vaccination. *Journal of Mathematical Biology*, 88(6), 71. https://doi.org/10.1007/s00285-024-02090-z

Bullock, H. L., Lavis, J. N., Wilson, M. G., Mulvale, G., & Miatello, A. (2021). Understanding the implementation of evidence-informed policies and practices from a policy perspective: a critical interpretive synthesis. *Implementation Science*, 16(1), 18. https://doi.org/10.1186/s13012-021-01082-7

Bvuchete, M., Grobbelaar, S., & Eeden, J. Van. (2022). Digitalisation and sustainable supply chain strategy: an instrument for improving efficiencies in the public healthcare sector.

International Journal of Learning and Change, 14(5/6), 559. https://doi.org/10.1504/IJLC.2022.126422

Dadari, I., Belt, R. V., Iyengar, A., Ray, A., Hossain, I., Ali, D., Danielsson, N., & Sodha, S. V. (2023). Achieving the IA2030 coverage and equity goals through a renewed focus on urban immunization. *Vaccines*, 11(4), 809. https://doi.org/10.3390/vaccines11040809

Decouttere, C., De Boeck, K., & Vandaele, N. (2021). Advancing sustainable development goals through immunization: a literature review. *Globalization and Health*, 17(1), 95. https://doi.org/10.1186/s12992-021-00745-w

Dwyer, H., Enria, L., Palmer, J., Ayub, S., & Beckmann, N. (2025). Trust, information and vaccine confidence in crisis settings: a scoping review. *Public Health Challenges*, 4(3), e70073. https://doi.org/10.1002/puh2.70073

Hanney, S. R., Straus, S. E., & Holmes, B. J. (2022). Saving millions of lives but some resources squandered: emerging lessons from health research system pandemic achievements and challenges. *Health Research Policy and Systems*, 20(1), 99. https://doi.org/10.1186/s12961-022-00883-6

Ho Cong, D. (2025). Sustainable development of high-quality human resources. *Revista Gestão & Tecnologia*, 25(2), 287–315. https://doi.org/10.20397/2177-6652/2025.v25i2.3159

Khatiwada, A. P., Shrestha, S., Dharel, D., & Sapkota, B. (2023). Immunization practice in low- and middle-income countries. in *encyclopedia of evidence in pharmaceutical public health and health services research in pharmacy* (pp. 851–866). Springer International Publishing. https://doi.org/10.1007/978-3-030-64477-2_40

Khatri, R. B., Endalamaw, A., Erku, D., Wolka, E., Nigatu, F., Zewdie, A., & Assefa, Y. (2024). Enablers and barriers of community health programs for improved equity and universal coverage of primary health care services: a scoping review. *BMC Primary Care*, 25(1), 385. https://doi.org/10.1186/s12875-024-02629-5

Micek, K., Hester, K. A., Chanda, C., Darwar, R., Dounebaine, B., Ellis, A. S., Keskinocak, P., Leslie, A., Manyando, M., Sililo Manyando, M., Nazzal, D., Awino Ogutu, E., Sakas, Z., Castillo-Zunino, F., Kilembe, W., Bednarczyk, R. A., & Freeman, M. C. (2022). Critical success factors for routine immunization performance: A case study of Zambia 2000 to 2018. *Vaccine: X*, 11, 100166. https://doi.org/10.1016/j.jvacx.2022.100166

Moss, W. J., Shendale, S., Lindstrand, A., O'Brien, K. L., Turner, N., Goodman, T., & Kretsinger, K. (2021). Feasibility assessment of measles and rubella eradication. *Vaccine*, 39(27), 3544–3559. https://doi.org/10.1016/j.vaccine.2021.04.027

Patel, C., Rendell, N., Sargent, G. M., Ali, A., Morgan, C., Fields, R., & Sheel, M. (2023). Measuring national immunization system performance: a systematic assessment of available resources. *Global Health: Science and Practice*, 11(3), e220055. https://doi.org/10.9745/GHSP-D-22-00555

Paul, A. M., Nepal, S., Upreti, K., Lohani, J., & Rimal, R. N. (2022). The last stretch: barriers to and facilitators of full immunization among children in Nepal's Makwanpur District, results from a qualitative study. *PLOS ONE*, 17(1), e0261905. https://doi.org/10.1371/journal.pone.0261905

Restivo, V., Fallucca, A., Trapani, F., Immordino, P., Calamusa, G., & Casuccio, A. (2023). Measles immunization status of health care workers: a cross-sectional study exploring factors associated with lack of immunization according to the health belief model. *Vaccines*, 11(3), 618. https://doi.org/10.3390/vaccines11030618

Schramme, T. (2023). Health as complete well-being: The WHO definition and beyond. *Public Health Ethics*, 16(3), 210–218. https://doi.org/10.1093/phe/phad017

Scott, G. Y., Aborode, A. T., Adesola, R. O., Khan, M., Elebesunu, E. E., Oluwaseun, A. A., Ahmad, M., Nibokun, E. O., Kwaku, S. D., Bakre, A. A., Chukwu, P. N., Olapade, Z., Osu, A. I., Onifade, I. A., Ogundijo, O. A., Olaoye, J., Bakare-Abidola, T., Fakorede, S., & Olapade, S. (2025). Enhancing vaccine quality and accessibility: strategies for efficient storage and distribution in resource-constrained environment. *Outbreak Management and Response*, 1(1), 2443439. https://doi.org/10.1080/29947677.2024.2443439

Stenberg, K., Watts, R., Bertram, M. Y., Engesveen, K., Maliqi, B., Say, L., & Hutubessy, R. (2021). Cost-effectiveness of interventions to improve maternal, newborn and child health outcomes: a WHO-CHOICE analysis for eastern sub-Saharan Africa and South-East Asia. *International Journal of Health Policy and Management*, 10(11), 706–723. https://doi.org/10.34172/ijhpm.2021.07

Uğrak, U., Aksungur, A., Akyüz, S., Şen, H., & Seyhan, F. (2025). Understanding the rise of vaccine refusal: perceptions, fears, and influences. *BMC Public Health*, 25(1), 2574. https://doi.org/10.1186/s12889-025-23754-5

World Health Organization, United Nations Children's Fund, & Gavi, the Vaccine Alliance. (2023). *The big catch-up: an essential immunization recovery plan for 2023 and beyond*. https://www.who.int/publications/i/item/9789240075511

World Health Organization. (2024). *Targeted and selective strategies in measles and rubella vaccination campaigns: interim guidance*.

Wren-Lewis, S., & Alexandrova, A. (2021). Mental health without well-being. *The Journal of Medicine and Philosophy: A Forum for Bioethics and Philosophy of Medicine*, 46(6), 684–703. https://doi.org/10.1093/jmp/jhab032