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Policy Strategies to Increase Complete Basic Immunization Coverage in an Effort to Reduce Morbidity Rates Among Infants in Dairi Regency

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ABSTRACT

The coverage rate for the Complete Basic Immunization (IDL) in Dairi Regency has shown a downward trend, falling from 76.17% in 2024 to 60.2% in 2025. This achievement has not met the 77% target set in the Dairi Regency Health Office's Strategic Plan. This situation calls for appropriate policy strategies to expand immunization coverage and strengthen disease prevention among infants. This study aims to identify priority policy alternatives to increase RCI coverage in Dairi Regency. The study employed policy analysis through the review and organization of secondary data and supporting documents, including relevant regulations and health references. A number of policy alternatives were then evaluated using six assessment dimensions: effectiveness, efficiency, adequacy, equity, responsiveness, and feasibility. The prioritization of alternatives was based on the assessment results of key personnel within the Dairi Regency Health Office. The evaluation identified three policy intervention options: optimizing the management of Adverse Events Following Immunization (AEFI) alongside pre-vaccination counseling; strengthening the role of community health workers and community leaders in providing education; and expanding public communication regarding the benefits of immunization. Based on the weighted results, the first option ranked highest with a score of 27, followed by the involvement of community health workers and community leaders with a score of 25, while public education received a score of 20. Strengthening the management of adverse events following immunization (AEFI) integrated with pre-immunization counseling was identified as the primary policy option to address low IDL coverage in Dairi Regency. Its implementation must be supported by consistent service procedures, readiness of AEFI management facilities, and the integrated delivery of immunization education and monitoring. The implementation of this strategy is expected to strengthen parents' trust in immunization services and support the prevention of vaccine-preventable diseases.

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INTRODUCTION

The administration of routine immunizations is one of the most effective preventive measures for reducing infant and child mortality rates and improving public health. Routine immunizations are administered starting at birth as the first step in building immunity against various infectious diseases that can be prevented through vaccination. Timely and schedule-compliant immunization not only protects individuals but also contributes to the development of herd immunity, thereby reducing the risk of disease transmission in the community (Arefti et al., 2026).

The immunization program in Indonesia has been in place since 1977 with the aim of reducing childhood morbidity and mortality caused by Vaccine-Preventable Diseases (VPDs). The legal basis for the Immunization Program is rooted in the 1945 Constitution, the Child Protection Law No. 35 of 2014, the Regional Government Law No. 23 of 2014, Law No. 17 of 2023 on Health, and several other Government Regulations (Kemenkes RI, 2025).

Complete primary immunization is defined as a child having received all routine immunizations according to the established schedule before reaching one year of age, specifically between 0 and 11 months of age. Complete primary immunization includes three doses of hepatitis B vaccine, one dose of BCG, three doses of DPT-HB-Hib, four doses of oral polio vaccine, and one dose of measles or MR vaccine. The complete and timely administration of basic immunizations is crucial for providing optimal protection against vaccine-preventable diseases, while also playing a role in reducing infant morbidity and mortality rates and improving the overall health of children (Arefti et al., 2026).

Immunization is a right of every child that must be provided and guaranteed by the government. The Immunization Program has been designated as one of the health priorities in the National Medium-Term Development Plan (RPJMN), in line with the Global Immunization Agenda 2030 (IA 2030) strategy, regional frameworks, and the Gavi 5.0 initiative. The immunization program falls under the first pillar primary prevention through the administration of routine immunizations against 14 antigens and the expansion of coverage throughout Indonesia. Immunization is considered a public health intervention with the highest return on investment (ROI), as it prevents permanent disabilities and premature death while minimizing the financial burden of disease treatment. Since the reprioritization of the national health system due to the COVID-19 pandemic, there has been a decline in the achievement of Complete Basic Immunization (IDL) coverage in several regions of Indonesia (Kemenkes RI, 2025).

According to WHO data, Indonesia once ranked sixth globally in terms of the number of zero-dose children (children who had not yet received any doses of the basic immunization series). This situation has directly led to an increase in cases and outbreaks of vaccine-preventable diseases (VPDs), specifically 53 measles outbreaks in 37 regencies/cities across 16 provinces, 1 rubella outbreak in 1 regency/city, 1 mixed (measles-rubella)

outbreak in 1 regency in 1 province, 6 cases of PDVN2-n in 5 regencies/cities, 1 case of VDPV2 in 1 regency/city in 1 province, 131 diphtheria outbreaks in 89 regencies/cities across 25 provinces, 16 cases of tetanus in 16 regencies/cities across 10 provinces and 27 tetanus-related deaths in 19 regencies/cities across 12 provinces, as well as 944 cases of pertussis in 144 regencies/cities across 27 provinces.

The risks faced if the immunization program fails include the potential failure to achieve the targets for polio eradication and measles-rubella elimination by 2026, the potential failure to maintain Indonesia's polio-free status achieved in 2014 and the potential failure to sustain the elimination of neonatal tetanus (NT), which has been achieved since 2016; an increase in morbidity, disability, and child mortality; a decline in the quality of human resources; an increased economic burden; and the need for very high costs to address disease outbreaks (Kemenkes RI, 2025).

According to data from the 2023 Indonesian Health Survey, only 35.8% of Indonesian children aged 12–23 months have received a complete primary immunization series. In North Sumatra Province, the proportion of children aged 12–23 months with a complete primary immunization series (IDL) is only 20.8%, while the proportion of children aged 24–35 months who have received follow-up immunizations for DPT/HB/Hib is 34.9% and for measles-rubella (MR/MMR) is 28.1%. These coverage rates remain below the national average of 35.8% for IDL and 53.9% for booster immunization coverage (Kemenkes RI, 2023).

In 2025, based on data from the Dairi Regency health profile, the coverage rate for the Complete Basic Immunization Series in Dairi Regency was 60.2%. This represents a decline compared to the 2024 rate of 76.17% (North Sumatra Province, 2025). This rate has not yet met the 77% target set in the Dairi Regency Health Office's strategic plan. The low coverage of the complete basic immunization schedule contributes to an increase in the incidence of vaccine-preventable diseases among infants in Dairi Regency. In 2025, there were 6 reported cases of Acute Flaccid Paralysis (AFP), 2 cases of pertussis, 45 cases of hepatitis B, and 10 suspected cases of measles. In 2025, an outbreak of measles was also reported (Dinkes Dairi, 2025).

METHOD

The data collection method involves identifying the required data and gathering relevant reference materials. These reference materials include various laws and regulations, such as Acts and Minister of Health Regulations. The data processing begins by tabulating and consolidating the collected data, ensuring it is complete and structured according to the needs of the analysis. Next, policy alternatives are formulated using appropriate theories and evaluated based on specific criteria. Priorities among the policy alternatives are selected through an assessment by key personnel based on considerations of effectiveness, efficiency, adequacy, equity, responsiveness, and policy feasibility (DUNN, 2017).

RESULT AND DISCUSSION

To achieve the highest possible level of public health in Indonesia, disease prevention efforts are carried out through optimal protection namely, the complete and continuous administration of routine immunizations according to the life cycle. Complete routine immunization consists of vaccinations administered to infants, children under two years of age, elementary school-aged children, adolescents, adults, and the elderly. Failure to maintain routine immunization coverage above the herd immunity threshold (85–95%, depending on the type of antigen) leads to the re-emergence of diseases that should already be under control. The economic burden resulting from treating diphtheria cases in intensive care units or managing complications such as measles-related encephalitis far exceeds the cost of procuring and distributing the vaccines themselves.

Concerns that a child may develop a fever, become fussy, or experience swelling at the injection site—which disrupt parents' daily caregiving activities—along with traumatic past experiences and negative experiences with previous immunization doses, are the causes of public resistance to immunization. Cases of illness or death in children that occur coincidentally shortly after immunization are unilaterally claimed by the public to be a direct result of the vaccine, without undergoing a valid medical causality assessment.

According to the Health Belief Model developed by Rosenstock, this theory explains why a person is willing or unwilling to take certain health-related actions. This theory assumes that a person's behavior is influenced by their beliefs or perceptions regarding a particular matter and the available options for action. In the context of immunization, this theory explains that parents' decisions to have their infants vaccinated are based not only on medical information but also on how they perceive the risks of disease, the benefits of vaccines, and any potential barriers (Rosentock, 1960).

The social attribution theory developed by Harold Kelley (1967) explains how people attempt to understand and explain the causes of certain behaviors or events. According to Kelley, when observing someone's behavior, individuals seek its causes by making attributions that is, assessing whether the behavior is caused by factors originating from the individual (internal) or from the environment (external). Internal attributions explain that a person's behavior is caused by their own characteristics namely, personality, attitudes, values, motivations, knowledge, and beliefs. External factors, on the other hand, include the social and cultural environment, information received, government policies, family influence, and social media (Kelley, 1967). In relation to immunization, we can see a mother refusing vaccination because she believes vaccines are dangerous. In this case, the refusal is attributed to personal beliefs or attitudes (internal). Conversely, when a father refuses a vaccine because he has been influenced by misinformation on social

media or by a community leader's advice to reject the vaccine, the refusal is attributed to external factors.

Law No. 35 of 2014 Amending Law No. 23 of 2002 on Child Protection states that every child has the right to health care and social security in accordance with their physical, mental, spiritual, and social needs. Based on this, health programs such as immunization are no longer merely voluntary government programs but have become a constitutional right for every Indonesian child to be protected from illness, disability, and death caused by disease. Therefore, providing a complete course of immunizations is the most fundamental way to fulfill children's rights.

Law No. 17 of 2023 on Health emphasizes that the central government and local governments are responsible for providing a full course of immunizations to every infant and child. The goal is to provide protection against diseases that can be prevented through immunization. Families, the central government, local governments, and the public must support immunization. The central government and local governments are responsible for covering the costs incurred in the event of adverse events following immunization. The government also has an obligation to provide accurate information to the public regarding the benefits and risks of immunization. Based on the analysis conducted, policy options that could address immunization refusal among the population in Dairi Regency include the following:

Strengthening AEFI management and pre-immunization counseling services

AEFI management is a series of systematic procedures aimed at detecting, managing, and evaluating medical symptoms that arise following immunization. This management aims to ensure patient safety and maintain public confidence in vaccine safety. AEFI management focuses on clinical interventions and direct interpersonal communication at health facilities. Based on the Indonesian Ministry of Health's Technical Guidelines for AEFI Surveillance, this policy alternative includes stricter enforcement of Standard Operating Procedures (SOPs) by vaccinators. Operational steps include standardizing the screening of children's eligibility, providing KIPI emergency kits at every Posyandu, mandating a 30-minute observation period following dual vaccinations, and implementing interactive, two-way educational methods by healthcare workers when providing pre-immunization counseling to parents.

It is hoped that strengthening AEFI management and pre-immunization counseling services will reduce parents' fears, increase trust in healthcare workers, and curb the spread of misinformation about immunization. What this policy alternative shares with other policy alternatives is that they all rely on communication and education tools to erode negative perceptions and lower the rate of refusal of double doses. Meanwhile, what distinguishes this policy alternative from others is that this intervention is formal-clinical in nature, based on evidence-based

medicine, and relies entirely on the authority of health services under the Dairi Regency Health Office. The communication established is personal and private within the service setting, rather than mass or communal in nature. Meanwhile, its ability to resolve issues related to community resistance to immunization is very high and directly targets the root of the psychological problem (fear of medical procedures). Pre-immunization counseling provides clear information to parents that, clinically speaking, dual injections do not increase the risk of side effects compared to single injections. The assurance of healthcare workers' preparedness and the guarantee of responsive management of adverse events following immunization (AEFI) including a healthcare facility hotline-provide parents with a sense of security when bringing their infants to the service location.

Engaging community leaders, religious leaders, community figures, and traditional leaders to campaign and educate the public on the importance of immunization

This policy alternative prioritizes a sociocultural approach through the mobilization of non-health actors in Dairi Regency (such as Batak Pakpak/Toba traditional leaders and interfaith leaders). Based on the community empowerment strategy recognized by the Ministry of Health, these leaders and Posyandu volunteers are trained using official Ministry of Health modules to act as frontline communicators to counter misinformation regarding the dangers of double injections. This policy alternative shares similarities with other policies in that it involves the persuasive transfer of information and education to transform public concerns about adverse events following immunization (AEFI) into acceptance of immunization.

Meanwhile, what distinguishes this approach from other policy alternatives is that it is informal, macrosocial, and community-based. Its primary focus is on breaking down cultural resistance, misguided social norms, or communication barriers. This policy's ability to resolve issues is highly effective in expanding the program's reach and mobilizing parents who initially refused or were afraid to come to the Posyandu. However, this option has limitations in addressing specific technical and medical concerns. When parents ask about the pharmacological mechanism of how a baby's body processes two vaccines at once, community health workers and community leaders still require the presence of healthcare professionals to provide authoritative clinical answers.

Developing a public education program focused on the benefits of immunization

This policy implements a large-scale public communication, information, and education (KIE) strategy through mass media, digital platforms, local radio stations (such as RRI or private radio stations in Dairi), and the display of promotional materials (billboards/leaflets). The educational content adopts materials from the Indonesian Ministry of Health's Directorate of Health Promotion, which emphasizes the efficiency

of clinic visits and the acceleration of specific antibody formation in children through double-dose vaccination. An alternative focus of this policy is to position improved health literacy as a key pillar for alleviating parents' concerns regarding vaccine side effects.

The differences from other policies are that this policy is one-way, impersonal, macro-scale, and relies on intermediary media (non-face-to-face). Its reach covers the entire Dairi Regency simultaneously. This policy alternative is quite effective at raising initial public awareness and normalizing the dual-vaccination program at the regency level. However, this option is less effective at alleviating the situational anxiety experienced by parents. The mass media cannot facilitate interactive dialogue to reassure mothers who panic when their babies develop a fever following dual-vaccination.

In analyzing the priorities of policy alternatives, an assessment was conducted by key personnel at the Dairi Regency Health Office (the head of the office, division heads, and program managers) based on considerations of effectiveness, efficiency, adequacy, equity, responsiveness, and feasibility (DUNN, 2017).

Table 1. Alternative Policy Scoring

	Alternative Selection Criteria (Scores 1–5)						
	Effectiveness	**Efficiency**	**Adequacy**	**Similarities**	**Responsiveness**	**Feasibility**	**Total**
Strengthening AEFI management and pre-immunization counseling services	5	4	4	5	5	4	27
Engaging community leaders, religious leaders, community figures, and traditional leaders to campaign and educate the public about the importance of immunization	5	4	4	4	4	4	25
Developing a public education program focused on the benefits of immunization	4	4	3	3	3	3	20

Based on the scoring analysis above, strengthening AEFI management and pre-immunization counseling services is the policy with the highest score. The selection of this policy is supported by policy documents and regulations from the Indonesian Ministry of Health. This policy directly implements the Ministry of Health's mandate requiring stricter Standard Operating Procedures (SOPs) for the holistic administration of immunizations ranging from rigorous screening (ensuring children are truly healthy as the primary requirement for multiple doses according to the National Commission on KIPI) to a tiered

referral mechanism in the event of an emergency. According to the Ministry of Health's guidelines, excessive anxiety related to immunization and its side effects (immunization anxiety-related response) can be effectively mitigated through interpersonal communication, particularly counseling.

The use of the teach-back method in counseling ensures that parents understand the five simple steps for managing mild AEFI at home, such as administering therapeutic anti pyretics, applying cold compresses, and ensuring adequate hydration. This approach significantly reduces the level of panic regarding immunization side effects. Timely management of AEFI is crucial for maintaining public trust in the national immunization program. If community health centers in Dairi Regency are responsive and successfully manage post-immunization symptoms quickly and free of charge, this will create positive social proof that spreads by word of mouth among parents, thereby significantly reducing resistance to double doses.

CONCLUSION

To support the strengthening of AEFI management and pre-immunization counseling services in Dairi Regency, a regulatory framework is needed to define the duties, authorities, and program implementation—serving as a guideline for implementation procedures and coordination among relevant agencies. These policy recommendations will be formalized in a Dairi Regent's regulation on strengthening AEFI management and pre-immunization counseling services in Dairi Regency. This policy is aimed at strengthening immunization management in all community health centers in Dairi Regency through three main pillars, namely:

1. Require healthcare workers and vaccinators to first provide pre-vaccination education to ensure parents understand how to manage adverse events following immunization (AEFI) at home;
2. Ensure the availability of AEFI kits (epinephrine, syringes, IV fluids) at every service point, including Posyandu in remote villages.
3. Integrate real-time reporting of double-vaccination coverage and post-immunization symptom complaints through the Sehat Indonesiaku (ASIK) app and the Ministry of Health's SatuSehat ecosystem.

It is hoped that this Regent's regulation will improve healthcare workers' compliance with standard operating procedures (SOPs) for screening infants' physical fitness prior to immunization; enhance emergency preparedness by standardizing the availability of adverse event monitoring kits (KIPI) down to the posyandu level; ensure responsive post-service monitoring; reduce anxiety regarding immunization side effects; foster positive social proof; and eradicate myths and misinformation about immunization. It is also hoped that this regent's regulation will eliminate fears of side effects, gradually reduce the public's reluctance to bring their infants for combined vaccinations within the service area of the Dairi District Public Health Center,

accelerate the achievement of IDL targets, and lower the number of children with zero doses. The greatest long-term impact will be the establishment of robust herd immunity across all sub districts in Dairi District, thereby protecting the region from the threat of deadly disease outbreaks such as measles, diphtheria, and pertussis.

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