

An Overview of Total Fertility Rate and Unintended Pregnancy on the Nutritional Status of Underweight Toddlers in Rote Ndao Regency in 2025

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Abstract. *High fertility rates reflected by the Total Fertility Rate (TFR) and high rates of Unwanted Pregnancy (UP) are structural risk factors contributing to nutritional problems in children under five, particularly underweight (WAZ). Based on the 2025 Family Data Update, the TFR in Rote Ndao District reached 3.06 far exceeding the national average of 2.12, while the percentage of unwanted pregnancies reached 34.9%, the highest compared to the national average (14%) and NTT Province (10.4%). This coincides with a prevalence of underweight (WAZ) of 22.7% out of 11,067 children weighed, based on data from the Rote Ndao District Health Office in 2025. This study aims to analyze the relationship between TFR and UP and the nutritional status of children under five (WAZ) in Rote Ndao District in 2025, using a descriptive-analytic approach based on secondary data. Data were sourced from the 2025 Family Data Update (BKKBN) and the Rote Ndao District Health Office 2025. Results show a consistent pattern: areas with high TFR and high UP rates tend to have higher prevalence of underweight. Short birth intervals caused by high TFR lead to competition for nutritional resources among children in the family, while unwanted pregnancies imply inadequate pregnancy preparation, lower quality of prenatal care, and increased risk of infant malnutrition. The significant disparity between Rote Ndao District and the national average indicates the need for integrated interventions combining family planning programs, improved access to contraception, nutrition education for pregnant women, and strengthened child growth monitoring systems.*

Keywords: *Total Fertility Rate, Unwanted Pregnancy, Child Nutrition, WAZ, Rote Ndao, Secondary Data*

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INTRODUCTION

The nutritional status of toddlers is a key indicator of public health and the quality of a nation's human resources (Mkhize & Sibanda, 2020; Martorell, 2017). Underweight in toddlers is defined as a Z-score of <-2 SD, reflecting acute or chronic nutritional deficits that can have long-term impacts on cognitive development, productivity, and susceptibility to disease. In Indonesia, efforts to reduce the prevalence of malnutrition in toddlers are a top priority in the 2020–2024 National Medium-Term Development Plan (RPJMN), with a target of wasting prevalence below 7% and stunting below 14% by 2024.

Demographic factors, particularly fertility rates and unplanned pregnancies, are closely linked to children's nutritional status. A high Total Fertility Rate (TFR) reflects a high average number of children born to a woman throughout her reproductive life, which implies an increased

caregiving burden, reduced per capita family resources, and shorter birth spacing. Short birth spacing (<24 months) is consistently associated with a higher risk of malnutrition in children due to reduced duration of exclusive breastfeeding and limited attention and resources available to each child (Rutstein, 2008; Kozuki et al., 2013).

Unintended pregnancy (KTD) is another dimension of fertility issues that has serious health implications. Unplanned pregnancies are often accompanied by poor physical and psychological preparation for the mother, delayed antenatal care, low consumption of prenatal nutritional supplements, and a higher risk of complications (Gipson et al., 2008; Mohllajee et al., 2007). Various studies have shown that children born from unintended pregnancies have a higher risk of low birth weight, shorter breastfeeding duration, and poorer nutritional status than children from planned pregnancies (Bahk et al., 2015; Cheng et al., 2009).

Rote Ndao Regency, an island regency in the southern tip of Indonesia, faces dual challenges in fertility and nutrition. Based on the 2025 Family Data Update by the National Population and Family Planning Board (BKKBN), the TFR in Rote Ndao Regency reached 3.06, significantly exceeding the national average (2.12) and the East Nusa Tenggara (NTT) Province average (2.81). The percentage of unintended births (KTD) in the regency, at 34.9%, is well above the national average (14.0%) and the East Nusa Tenggara (NTT) Province average (10.4%). Simultaneously, data from the Rote Ndao Regency Health Office in 2025 recorded a prevalence of underweight among toddlers of 22.7% out of a total of 11,067 toddlers weighed, placing the regency in the category of serious nutritional problems according to WHO standards (prevalence >20%).

Global studies over the past five years have increasingly strengthened the link between high TFR and unintended births and poor nutritional status in children. An analysis of DHS data from 30 developing countries Chagomoka et al., 2022 found that children from high-parity families (≥ 4 children) had a 1.6-fold higher risk of underweight compared to children from low-parity families. In Indonesia, analysis of the 2022 SSGI data confirmed that districts with a high TFR tended to have a significantly higher prevalence of malnutrition. However, specific studies integrating TFR and KTD data from the National Population and Family Planning Board (BKKBN) with nutritional status data from the Health Office at the district level are still very limited, particularly for the island regions of Eastern Indonesia.

Based on this background, this study aims to: (1) describe the achievement of TFR and KTD in Rote Ndao Regency based on the 2025 Family Data Update; (2) describe the prevalence of low weight for age (BW/U) nutritional status among toddlers per sub-district in Rote Ndao Regency; (3) analyze the relationship between TFR and KTD and BW/U nutritional status; and (4) provide evidence-based recommendations for addressing nutritional problems through an integrated approach to family planning and nutrition programs.

METHODS

This study employed a descriptive ecological study design based on secondary data analysis to describe and compare demographic and child nutrition indicators at the aggregate population level. An ecological approach was selected because all variables were obtained from official aggregated datasets rather than individual-level observations, allowing a situational analysis of demographic and health conditions without primary data collection (Creswell & Creswell, 2018). Accordingly, the findings represent population-level patterns and should not be interpreted as individual-level associations. Secondary data were obtained from two official government sources. Total Fertility Rate (TFR) and the proportion of unintended pregnancy were obtained from the 2025 Family Data Update published by the National Population and Family Planning Board (BKKBN) under Decree Number 284/KEP/L/2025. These data represent official population statistics for Rote Ndao Regency, East Nusa Tenggara Province, and Indonesia in 2025. Data on the nutritional status of children under five were obtained from the Rote Ndao Regency Health Office based on the 2025 routine child growth monitoring and weighing program conducted through community health centers (Puskesmas). The nutritional status data represent

the prevalence of underweight children by sub-district within Rote Ndao Regency. The variables analyzed in this study included Total Fertility Rate (TFR), unintended pregnancy, and underweight prevalence among children under five. TFR was defined as the average number of children expected to be born to a woman during her reproductive lifetime according to the age-specific fertility rates reported by BKKBN. Unintended pregnancy referred to pregnancies classified by BKKBN as unplanned or unwanted at the time of conception. Underweight was defined as a weight-for-age Z-score (WAZ) below -2 standard deviations based on the WHO Child Growth Standards and included both moderate and severe underweight cases. The unit of analysis was aggregate population data. TFR and unintended pregnancy were analyzed at the regency, provincial, and national levels, whereas underweight prevalence was analyzed at the sub-district level within Rote Ndao Regency. Because the variables were available at different administrative levels, this study did not perform statistical tests of association between variables. Instead, the analysis focused on descriptive comparison, trend identification, and gap analysis by comparing Rote Ndao Regency with provincial and national indicators and by describing the distribution of underweight prevalence across sub-districts. The interpretation of observed patterns was supported by evidence from recent scientific literature published between 2020 and 2025

RESULT AND DISCUSSION

TFR and KTD Indicators for Rote Ndao Regency in 2025

Based on the 2025 Family Data Update, which refers to the Decree of the Minister of Education and Culture/Head of the National Population and Family Planning Board (BKKBN) Number 284/KEP/L/2025, the TFR and KTD achievements of Rote Ndao Regency can be compared with those of NTT Province and the national level, as presented in Table 1.

Table 1. Comparison of TFR, KTD, and Prevalence of Underweight in Toddlers in Rote Ndao Regency, NTT Province, and the National Level in 2025

No	Region	TFR	Percentage of Unwanted Pregnancy (%)	Prevalence of Underweight Among Children Under Five (%)	Description
1	Rote Ndao Regency	3.06	34.9	22.7	High
2	East Nusa Tenggara Province	2.81	10.4	–	Moderate
3	National	2.12	14.0	–	Low

Source: 2025 BKKBN Family Data Update; Rote Ndao Regency Health Office, 2025

Table 1 shows that Rote Ndao Regency's TFR of 3.06 is very high, exceeding the national average (2.12) and the East Nusa Tenggara (NTT) Province average (2.81). This means that the average woman in Rote Ndao Regency gives birth to three children during her reproductive life, far above the replacement level of 2.1, set as the target for the national family planning program. Simultaneously, the percentage of unintended births in the regency reached 34.9%, almost 2.5 times the national rate (14%) and more than three times that of East Nusa Tenggara (10.4%). This indicates that nearly one-third of pregnancies in Rote Ndao Regency are unintended by couples of childbearing age.

Prevalence of Underweight Nutritional Status (BW/A) in Toddlers per District

Data on toddler weighing results from the Rote Ndao Regency Health Office in 2025 presents the distribution of the prevalence of underweight in toddlers (Z-score <-2 SD) per district, as presented in Table 2.

Table 2. Distribution of Underweight Toddlers (BW/A) per District in Rote Ndao Regency in 2025

No.	District	Community Health Center	Children Weighed	Number of Underweight Children	Underweight Prevalence (%)
1	East Rote	Eahun	1,271	302	23.8
2	Landu Leko	Sotimori	402	58	14.4
3	Pantai Baru	Korbafo	643	167	26.0
4	Pantai Baru	Sonimanu	395	126	31.9
5	Central Rote	Feapopi	576	51	8.9
6	Lobalain	Ba'a	1,965	373	19.0
7	South Rote	Oele	418	122	29.2
8	Northwest Rote	Busalangga	1,171	323	27.6
9	Loaholu	Oelaba	1,073	385	35.9
10	Southwest Rote	Batutua	2,165	362	16.7
11	West Rote	Delha	762	200	26.2
12	Ndao Nuse	Ndao	226	44	19.5
Rote Ndao Regency			11,067	2,531	22.7

Source: Rote Ndao District Health Office, 2025

Table 2 shows that of the 11,067 toddlers weighed in Rote Ndao District, 22.7% were underweight (BW/A <-2 SD). This figure places Rote Ndao District in the 'serious' nutritional problem category according to the WHO classification (prevalence of 10–19% = moderate; 20–29% = serious; ≥30% = critical). The distribution of underweight BW/A cases is uneven across sub-districts, with prevalence varying from 8.9% (Central Rote/Feapopi) to 35.9% (Loaholu/Oelaba). Loaholu (Oelaba) District recorded the highest prevalence at 35.9%, followed by Pantai Baru (Sonimanu) at 31.9% and South Rote (Oele) at 29.2%. These three sub-districts fall into the 'critical' nutritional problem category (≥30%). Conversely, Central Rote (Feapopi) Sub-district recorded the lowest prevalence (8.9%), falling into the 'moderate' category. In absolute terms, Lobalain (Ba'a) Sub-district had the highest number of low weight for age cases (373 cases) due to its largest toddler population (1,965 toddlers weighed), while East Rote (Eahun) Sub-district had 302 cases (23.8%).

Relationship between TFR, Unintended Pregnancy (KTD), and Nutritional Status of Wt/A

The high TFR in Rote Ndao Regency (3.06) implies a shorter average birth interval. With an average of three children per woman in the reproductive period of 15–49 years, the average birth interval is estimated to be around 5–7 years between the first and last child. However, in practice, the birth interval can be much shorter. Birth spacing of <24 months is consistently associated with a higher risk of malnutrition due to: (1) early cessation of breastfeeding for the previous child; (2) reduced attention and care time per child; (3) limited family food resources that must be shared more widely; and (4) a higher risk of maternal nutritional depletion in subsequent pregnancies (Rutstein, 2008).

The 34.9% unplanned birth spacing indicates that nearly one in three pregnancies in Rote Ndao Regency is unplanned. The nutritional implications of unplanned birth spacing include inadequate preconception folic acid and iron supplementation, delayed first antenatal care (ANC-1), a higher risk of maternal psychological stress, and potentially lower nutritional investment in the fetus. Several studies confirm that children born to unplanned births have a higher risk of low birth weight (LBW), which is a strong predictor of poor nutritional status in toddlerhood (Cheng et al., 2009; Bahk et al., 2015).

A consistent pattern is seen in the data from Rote Ndao Regency: with a TFR of 3.06 and a KTD of 34.9%, the regency recorded a prevalence of underweight among toddlers of 22.7%, significantly higher than the national average. While this descriptive analysis based on secondary

data cannot establish a direct causal relationship, the pattern found aligns with the theoretical framework and empirical evidence found in the international literature.

High Total Fertility Rate as a Potential Contributor to Underweight Among Children Under Five

The present study showed that the Total Fertility Rate (TFR) in Rote Ndao Regency remained higher than the national average in 2025, while the prevalence of underweight among children under five varied considerably across sub-districts. Because the TFR and underweight data were available at different administrative levels, this study did not conduct statistical tests to assess their association. Therefore, the observed coexistence of relatively high fertility and underweight should be interpreted as a population-level pattern rather than evidence of a direct or causal relationship. Nevertheless, the finding is important because fertility may form part of the broader demographic and household context in which children's nutritional conditions develop.

One plausible mechanism is the dilution of household resources as the number of children increases (Öberg, 2017; Gibbs et al., 2016; Bougma et al., 2015). Larger families may need to distribute available food, financial resources, health-care expenditure, and parental time among more children, potentially reducing the resources available to each child. Recent evidence from 140 Demographic and Health Surveys covering 60 developing countries found that higher fertility at both the household and country levels was associated with poorer child nutritional outcomes. The negative effect of fertility was particularly evident in Asian settings, supporting the possibility that resource constraints associated with higher fertility can adversely affect child nutrition (Arestoff et al., 2025). However, because that study examined individual-level child data and the present study uses aggregate data, its findings should be considered supporting evidence rather than direct evidence of an association in Rote Ndao.

The nutritional implications of household resource constraints are also relevant to the Indonesian context (Siramaneerat et al., 2024; Titaley et al., 2019). A recent study among children under five in a coastal area of Indonesia found that household income was an important factor associated with underweight, with lower income reducing household purchasing power and potentially limiting food consumption (Buton & Fadmi, 2023). This finding is particularly relevant when interpreting fertility-related patterns because the nutritional consequences of a larger family are likely to depend on the household's ability to provide sufficient food and care for all children. Thus, TFR should not be viewed as an isolated determinant of underweight, but rather as one demographic characteristic that may interact with household socioeconomic conditions.

Recent Indonesian evidence also highlights the interconnected nature of fertility and nutritional conditions among women. Using data from the 2021 National Socio-Economic Survey, Simamora & Setyonaluri (2025) found an association between women's nutritional inadequacy and fertility intentions among married women aged 15–49 years. Although their study focused on women rather than children's nutritional status, the findings illustrate that fertility behaviour and nutritional conditions may influence one another across the reproductive life course. In the context of Rote Ndao, this reinforces the importance of considering maternal nutrition and reproductive health alongside child nutrition rather than examining fertility as an independent demographic indicator.

The variation in underweight prevalence across sub-districts in Rote Ndao further suggests that local contextual factors may be important. Previous research conducted in Rote Ndao found that maternal nutritional knowledge, history of childhood infection, and provision of local-food-based supplementary feeding were associated with nutritional status among children under five (Picauly et al., 2024). Although that study assessed height-for-age rather than weight-for-age, its findings indicate that child nutritional conditions in Rote Ndao are influenced by factors beyond fertility alone. Similarly, research from East Nusa Tenggara has identified rural residence, maternal education, and difficulties in accessing health facilities as important factors associated with child nutritional outcomes (Suratri et al., 2023). These findings provide a relevant

contextual explanation for why underweight prevalence may differ between sub-districts even when they are located within the same regency.

The geographical context of Rote Ndao should therefore be considered when interpreting the relationship between demographic and nutritional indicators. Evidence from Busalangga Health Center in Rote Ndao showed that accessibility was significantly associated with the utilization of antenatal care services, indicating that geographic and service-related barriers can influence maternal health-service utilization (Ballo et al., 2022). Such barriers may also affect access to family planning, nutrition counselling, child growth monitoring, and early nutritional intervention. Consequently, the relatively high TFR observed in Rote Ndao may be better understood as part of a wider ecological context involving reproductive health service access, socioeconomic conditions, maternal characteristics, and availability of child nutrition services.

Importantly, underweight was the specific nutritional outcome examined in this study and should therefore remain the focus of interpretation. Underweight is defined by a weight-for-age Z-score below -2 standard deviations according to the WHO Child Growth Standards (World Health Organization [WHO], 2006). Weight-for-age is a composite indicator because low weight-for-age may reflect wasting, stunting, or both; consequently, underweight should not be treated as synonymous with stunting or wasting. In this context, high fertility and short birth intervals may plausibly contribute to underweight through reduced household food availability, limited caregiving time, and reduced access to preventive health services, but these pathways were not directly measured in the present study and should therefore be regarded as possible explanations rather than demonstrated mechanisms.

Overall, the findings indicate that underweight in Rote Ndao should not be addressed through nutrition-specific interventions alone. A more comprehensive approach should integrate family planning, maternal nutrition, healthy birth spacing, child feeding, growth monitoring, and equitable access to health services (Black et al., 2016; Haselow et al., 2016; Heidkamp et al., 2021). In an archipelagic setting such as Rote Ndao, strengthening services at the sub-district and community levels may be particularly important to reduce geographical disparities in child nutritional status. The present findings therefore support an integrated demographic and nutrition perspective, while recognizing that further studies using data at the same geographical level are needed to directly assess whether fertility and unintended pregnancy are statistically associated with underweight among children under five.

Unintended Pregnancy and Its Potential Implications for Underweight Among Children Under Five

The present study found that the proportion of unintended pregnancy in Rote Ndao Regency remained an important reproductive health concern in 2025, while underweight prevalence among children under five varied across sub-districts. Although the ecological design and differences in the administrative level of the available datasets do not allow a statistical assessment of the association between unintended pregnancy and underweight, the coexistence of these conditions indicates that unintended pregnancy should be considered within the broader reproductive, maternal, and child health context of Rote Ndao.

Unintended pregnancy may influence child nutritional vulnerability through several indirect pathways. Align with research from Feld et al. (2019), Yazdkhasti et al. (2015), Alano & Hanson (2018), Gregory et al. (2024) a pregnancy that is unintended or mistimed may provide less opportunity for women and families to prepare financially, nutritionally, and psychologically for pregnancy and subsequent childcare. These circumstances may affect the utilization of antenatal and postnatal health services, maternal nutritional preparation, and the establishment of appropriate infant and young child feeding practices. Evidence from recent research indicates that maternal and reproductive factors before and during pregnancy are important components of the pathways leading to adverse child growth outcomes, particularly when they coexist with socioeconomic and health-service constraints.

The potential pathway between unintended pregnancy and underweight should be distinguished from pathways leading specifically to stunting or wasting (Yanti et al., 2025; Ayue et al., 2025; Marphatia et al., 2017). In the present study, the primary nutritional outcome was underweight, measured using weight-for-age (BB/U). According to the World Health Organization (WHO), underweight is defined as a weight-for-age Z-score below -2 standard deviations from the WHO Child Growth Standards median. Underweight is a composite indicator because a low weight-for-age may reflect wasting, stunting, or both (World Health Organization [WHO], 2025). Therefore, references to stunting, wasting, or low birth weight in interpreting the present findings should be understood as potential pathways or related nutritional conditions rather than as the primary outcomes examined in this study.

One plausible pathway is through low birth weight and subsequent growth. Maternal nutritional inadequacy, insufficient antenatal care, and adverse pregnancy conditions may increase the risk of low birth weight. A child who begins life with a low birth weight may subsequently have greater difficulty achieving adequate weight gain, particularly when postnatal nutritional intake and health care are inadequate. However, low birth weight should not be interpreted as synonymous with underweight. Rather, it represents a possible early-life pathway through which maternal and pregnancy-related conditions may influence later weight-for-age.

Infant and young child feeding may constitute another pathway. If an unintended pregnancy is accompanied by maternal psychosocial difficulties, inadequate preparation for childcare, or limited access to counselling, the adoption of recommended feeding practices may be compromised. Inadequate dietary intake or recurrent illness during infancy and early childhood can subsequently contribute to inadequate weight gain (Koletzko et al., 2019). This interpretation is consistent with the WHO's recognition that inadequate nutrition and illness are important contributors to impaired child growth and that weight-for-age is an important indicator for monitoring child nutritional status.

The Rote Ndao context is particularly important when interpreting these findings. As an archipelagic regency, differences in access to reproductive health services, antenatal care, nutrition counselling, and child growth monitoring may contribute to variation in both reproductive health outcomes and child nutritional status between sub-districts. Thus, the observed distribution of unintended pregnancy and underweight should not be interpreted as resulting from pregnancy intention alone. Instead, these indicators may reflect the interaction of reproductive behaviour with socioeconomic conditions, geographical accessibility, health-service availability, and household capacity to provide adequate care and nutrition.

Taken together, the findings suggest that prevention of underweight in Rote Ndao should begin before conception and continue throughout pregnancy and early childhood. Strengthening family planning counselling, increasing access to contraceptive services, improving pregnancy planning, and ensuring continuity of antenatal, postnatal, and child growth-monitoring services may help address the broader conditions associated with nutritional vulnerability. These efforts should be integrated with nutrition-specific interventions so that reproductive health programmes and child nutrition programmes address complementary stages of the same maternal and child health pathway.

Implications for Health and Family Planning Programs

The findings of this study have important implications for health and family planning programmes in Rote Ndao. The observed pattern of TFR, unintended pregnancy, and variation in underweight prevalence indicates that reproductive health and child nutrition should be addressed as interconnected public health priorities. However, because the present study used aggregate data measured at different administrative levels and did not statistically test the associations between these indicators, the findings should not be interpreted as evidence that higher fertility or unintended pregnancy directly causes underweight. Rather, the findings provide population-level information that can be used to identify areas where integrated

reproductive, maternal, and child health interventions may be strengthened (Garchitorena et al., 2025; Hall et al., 2023).

First, family planning services should be strengthened as part of a broader strategy to support pregnancy planning and healthy birth spacing. The relatively high fertility and occurrence of unintended pregnancy identified in the study indicate the importance of ensuring that women and couples have access to accurate information, a range of contraceptive methods, quality counselling, and appropriate follow-up. The World Health Organization emphasizes that family planning is an essential component of primary health care and that family planning services should be delivered as part of comprehensive sexual and reproductive health care (World Health Organization [WHO] & Johns Hopkins Bloomberg School of Public Health/Center for Communication Programs, 2022). In the context of Rote Ndao, these services are particularly important because geographical barriers may make regular access to facility-based reproductive health services more difficult for some communities.

Second, family planning counselling should extend beyond the provision of contraceptive methods and include pregnancy planning, birth spacing, maternal nutrition, and continuation of maternal and child health care. This life-course approach is consistent with the maternal nutrition framework in Indonesia, which emphasizes that maternal nutrition begins before conception and continues throughout pregnancy and the postpartum period (Ministry of Health of the Republic of Indonesia & UNICEF, 2023). Such an approach is relevant to the present findings because underweight, as measured by weight-for-age, may reflect inadequate dietary intake and illness during early childhood. Therefore, reproductive health interventions should be connected with maternal and child nutrition services rather than implemented as separate programme components.

Third, the variation in underweight prevalence across sub-districts identified in this study supports the need for geographically targeted nutrition and health interventions. Instead of implementing identical intervention intensity across all areas, health authorities could use available demographic, reproductive health, nutrition, and health-service indicators to identify communities requiring greater outreach and follow-up. The recent review of Indonesia's national nutrition programmes highlighted the continuing need to strengthen service delivery, coordination, financing, and data systems to address persistent inequalities in nutritional outcomes (Rusdianti et al., 2025; Marzulina et al., 2025; Afandi et al., 2026; Erlinawati, 2025; Shiddiq & Effendi, 2025). In an archipelagic district such as Rote Ndao, community-based outreach and strengthened frontline health services may therefore be particularly important for maintaining regular child growth monitoring and ensuring timely nutritional intervention.

Fourth, family planning and child nutrition services should be integrated at the point of service. Family planning contacts during antenatal and postnatal care can provide opportunities for counselling on pregnancy planning and birth spacing, while child growth-monitoring services can provide opportunities to identify nutritional vulnerability and connect families with appropriate maternal and reproductive health services. WHO guidance supports the integration of family planning within primary health care and emphasizes the importance of accessible, high-quality counselling and contraceptive services (WHO & Johns Hopkins Bloomberg School of Public Health/Center for Communication Programs, 2022). In Rote Ndao, such integration may be particularly valuable in communities where families face geographical barriers and have limited opportunities for repeated visits to health facilities.

Fifth, the findings highlight the importance of strengthening local data systems for programme planning. An important methodological finding of this study was that TFR and unintended pregnancy data were available at the regency, provincial, and national levels, whereas underweight data were available at the sub-district level. This difference prevented statistical assessment of relationships between the demographic and nutritional indicators. Future programme monitoring would therefore benefit from more harmonized sub-district- or village-level information on fertility, unintended pregnancy, contraceptive utilization, maternal health

services, and child nutritional status. According to Sufri et al. (2024) the national nutrition programme review similarly identifies data systems and coordination as important areas for strengthening Indonesia's nutrition response. More consistent local data would enable health managers to identify geographical disparities more accurately, prioritize resources, and monitor changes in reproductive and child nutritional indicators over time.

Finally, the programme implications of this study should focus not only on reducing fertility or increasing contraceptive coverage but also on improving the conditions that support healthy pregnancy and child growth (Karra et al., 2022; Khan et al., 2016; Barham et al., 2021). An integrated approach linking family planning, pregnancy planning, maternal nutrition, antenatal and postnatal care, child feeding, and growth monitoring may provide a more comprehensive response to the nutritional vulnerability identified in Rote Ndao. In an archipelagic setting, these interventions should be adapted to local geographical conditions through outreach services, community-based health activities, strengthened referral mechanisms, and equitable distribution of health resources (Sinuraya et al., 2026; Febriyanti et al., 2025; Palma et al., 2025). These recommendations represent programme implications derived from the population-level patterns observed in this study and should not be interpreted as evidence of a direct causal effect of TFR or unintended pregnancy on underweight.

CONCLUSION

In 2025, Rote Ndao Regency recorded a TFR of 3.06 and a KTD percentage of 34.9%, both far exceeding the national average (TFR 2.12; KTD 14%) and the East Nusa Tenggara (NTT) Province average (TFR 2.81; KTD 10.4%). This, combined with a prevalence of underweight among toddlers of 22.7% out of 11,067 toddlers weighed, places the regency in the 'serious' nutritional problem category according to WHO standards. Significant disparities between sub-districts in the prevalence of underweight among toddlers (ranging from 8.9% to 35.9%) indicate the need for differentiated intervention strategies based on regional mapping. An integrated approach is needed that integrates family planning programs, increased access to contraception, postpartum family planning counseling, nutrition education for pregnant and breastfeeding mothers, and strengthening the toddler growth and development monitoring system within a comprehensive maternal and child health service package in Rote Ndao Regency.

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