Beyond Health Interventions: Economic and Maternal Education Determinants of Child Nutritional Attainment in Indonesia

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Abstract

Stunting and child malnutrition remain critical challenges in Indonesia, yet conventional strategies often rely heavily on clinical and medical interventions while neglecting the structural socio-economic drivers that underpin these issues. This study aims to analyze the non-health determinants of child nutritional attainment in Indonesia, specifically examining the role of household economic status and maternal education. Using a quantitative descriptive approach, this study analyzes secondary data from the Survey Status Gizi Indonesia (SSGI) 2024, focusing on three complementary infant and young child feeding (IYCF) indicators for children aged 6–23 months: Minimum Dietary Diversity (MDD), Minimum Meal Frequency (MMF), and Minimum Acceptable Diet (MAD). National-level proportions of these indicators are compared across household wealth quintiles and maternal education levels. Our findings indicate that children in higher wealth quintils have better nutritional attainment: MDD scores increase from 34.9% to 59.3%. Maternal education shows a comparable trend, where MAD attainment reaches 41.0% among mothers with higher education degrees. MMF shows a markedly flatter gradient across both economic and educational strata, suggesting that meal frequency is less sensitive to household resources than dietary diversity. These findings indicate that household economic status and maternal education are significantly associated with children's minimum nutritional attainment, particularly the diversity and adequacy of diet rather than feeding frequency alone. As a preliminary conclusion, this study suggests that the government should shift its focus from short-term, clinically oriented programs toward cross-sectoral public policies oriented around sustainable family economic empowerment and maternal education.

Keywords: Child Nutrition, Economic Status, Human Capital, Maternal Education, Public Policy

INTRODUCTION

Child health and growth are key indicators of a nation's social and economic development. Chronic undernutrition among children under five, particularly stunting, remains a major challenge for Indonesia's human capital development. National survey data show a substantial long-term decline in stunting prevalence, from 37.6% in 2013 to 19.8% in 2024 (Badan Kebijakan Pembangunan Kesehatan, 2025), yet the figure remains well above the World Health Organization's public health threshold of 20%. Beyond stunting, the 2024 Survei Status Gizi Indonesia (SSGI) also documents persistent gaps in infant and young child feeding (IYCF) practices: only around 48% of children aged 6–23 months meet the Minimum Dietary Diversity (MDD) standard, and barely a third meet the Minimum Acceptable Diet (MAD) standard nationally. These feeding-practice indicators capture dimensions of nutritional adequacy that are not reducible to clinical undernutrition alone,

and they are strongly patterned by household and maternal characteristics.

Child malnutrition is widely recognized as multidimensional, driven not only by direct biomedical causes such as inadequate dietary intake and recurrent infection, but also by underlying social, economic, and environmental conditions (Black et al., 2013). The conventional public health response in Indonesia has historically emphasized clinical and supplementary feeding interventions delivered through the posyandu and puskesmas system. Although clinical programs are necessary, focusing solely on the medical sector may not solve the root issues. Policy makers need to directly address the underlying socio-economic factors behind poor child nutrition. Household economic capacity determines a family's ability to access diverse and nutrient-dense food, while maternal education shapes caregiving knowledge, hygiene practices, and the capacity to translate household resources into appropriate child feeding behavior .

A growing body of literature has examined the socioeconomic correlates of child nutritional status in Indonesia, much of which focuses on anthropometric outcomes such as stunting and wasting as the primary dependent variable (Beal et al., 2018; Torlesse et al., 2016). Comparatively less attention has been given to proxy behavioral indicators of feeding adequacy, MDD, MMF, and MAD which the World Health Organization recommends as earlier and more actionable markers of nutritional risk than anthropometric status, since they reflect feeding practices that can still be modified before chronic growth faltering occurs (WHO, 2021). Existing Indonesian studies that disaggregate these IYCF indicators by household wealth and maternal education tend to rely on earlier rounds of national survey data, leaving an empirical gap regarding the most recent national patterns captured in SSGI 2024.

This study contributes to the literature by providing an updated, nationally representative descriptive analysis of how household economic status (proxied by wealth quintile) and maternal education relate to MDD, MMF, and MAD attainment among Indonesian children aged 6–23 months, using the most recently released SSGI 2024 data. The paper departs from the standard medical perspective by looking at child nutrition through the lens of human capital development and household economics. By comparing the three IYCF indicators separately, we can identify whether feeding diversity, frequency, or overall adequacy is the most sensitive dimension to economic and educational disparities. The findings are intended to support a shift in policy emphasis from short term, health sector centered interventions toward cross-sectoral public policy oriented around sustainable family economic empowerment and maternal education.

RESEARCH METHODOLOGY

This study employs a quantitative descriptive design using secondary data from the Survei Status Gizi Indonesia (SSGI) 2024, a nationally representative cross-sectional household survey conducted by the Badan Kebijakan Pembangunan Kesehatan (BKPK), Kementerian Kesehatan Republik Indonesia, in collaboration with the Badan Pusat Statistik (BPS) and the Badan Riset dan Inovasi Nasional (BRIN). The survey covers children under five years of age across all provinces and districts/cities in Indonesia.

The analytical sample for this study is restricted to children aged 6–23 months, the age group for which the World Health Organization's Infant and Young Child Feeding (IYCF) indicators are defined (WHO, 2021; WHO, 2023). Three dependent indicators are examined: (1) Minimum Dietary Diversity (MDD), the proportion of children consuming at least five of eight defined food groups in the previous 24 hours;

(2) Minimum Meal Frequency (MMF), the proportion of children meeting age-specific minimum feeding frequency thresholds; and (3) Minimum Acceptable Diet (MAD), a composite indicator requiring children to simultaneously meet MDD and MMF criteria (and, for non-breastfed children, the Minimum Milk Feeding Frequency criterion as well).

The two independent variables of interest are household economic status, measured through the SSGI wealth quintile classification (Terbawah/lowest to Teratas/highest) derived from household asset ownership, and maternal education, classified into six categories ranging from no formal schooling to completed Diploma/Bachelor's degree. Data are analyzed descriptively using the national proportion tables published in "SSGI 2024 dalam Angka" (Tabel 5.42, 5.44, and 5.48), which report the percentage of children meeting each IYCF indicator by characteristic, together with their 95% confidence intervals. Cross-tabulated proportions are compared across wealth quintile and maternal education strata to identify the direction and steepness of the socioeconomic gradient for each indicator. As this study relies on the survey's published aggregate tables rather than unit-record (raw) data, no individual-level inferential model (e.g., multivariate logistic regression) is estimated; the analysis is descriptive and comparative in nature, consistent with the scope of a proceeding paper.

RESULTS AND DISCUSSION

This section presents the national proportions of MDD, MMF, and MAD attainment among Indonesian children aged 6–23 months, disaggregated by household wealth quintile and maternal education level, followed by a discussion of how these patterns relate to existing literature on economic and human capital determinants of child nutrition.

Table 1 presents national MDD, MMF, and MAD proportions by household wealth quintile, while Table 2 presents the same indicators by maternal education level.

The cross-tabulations in Tables 1 and 2 reveal a consistent socioeconomic gradient in IYCF attainment, though the steepness of that gradient differs markedly across the three indicators. Dietary diversity (MDD) and overall diet adequacy (MAD) are the indicators most sensitive to both household wealth and maternal education, while meal frequency (MMF) shows almost no gradient at all, and is in fact slightly higher among the poorest households.

For household wealth quintile, MDD attainment increases by 24.4 percentage points from the lowest quintile (34.9%) to the highest (59.3%), and MAD attainment increases by 16.9 percentage points (23.3% to 40.2%). This pattern is consistent with the economic theory of household production, in which food diversity is a normal good: as income or asset holding rises, households are able to substitute toward more varied and nutrient-dense food groups, including animal-source protein and vitamin A rich fruits and vegetables, rather than relying on a narrow staple-dominated diet (Becker, 1964). The wealth gradient observed here mirrors, and is consistent in direction with, the broader stunting and underweight gradient documented elsewhere in the same survey, where stunting prevalence falls from 29.8% in the lowest economic quintile to 12.1% in the highest.

A similar, though comparatively moderate, gradient is observed for maternal education. MDD attainment rises from 31.9% among children of mothers with no schooling to 59.7% among children of mothers with completed Diploma/Bachelor's education, a difference of 27.8 percentage points, while MAD attainment rises from 19.9% to 41.0%, a difference of 21.1 percentage points. This is consistent with the human capital framework of Schultz (1961), in which maternal

education functions as a form of human capital that improves the efficiency with which household resources are converted into child welfare outcomes in this case, through improved knowledge of appropriate complementary feeding practices, food group diversity, and hygiene, independent of the household's economic capacity. Notably, the gradient by maternal education for MDD and MAD is comparable in magnitude to the gradient by wealth quintile, suggesting that maternal education operates as a determinant of feeding quality that is at least as important as household economic status, echoing the findings of Ravallion and Chen (1997) on the joint role of income and human capital in welfare improvement.

In contrast, MMF shows almost no association with either wealth or maternal education: it ranges narrowly from 67.7% in the lowest wealth quintile to 65.3% in the highest, and from 62.8% among children of mothers with no schooling to 66.9% among children of mothers with tertiary education. The lack of variation in MMF scores implies that feeding frequency in Indonesia does not depend much on household wealth or education, this pattern is potentially driven by common cultural habits regarding daily meal times. The implication is that nutritional disadvantage among poorer and less-educated households in Indonesia operates primarily through the quality and composition of food offered dietary diversity rather than through how often children are fed. This distinction matters for policy design: interventions that focus narrowly on encouraging more frequent feeding are unlikely to close the observed gap in overall diet adequacy (MAD), since MAD attainment is being constrained primarily by the MDD component rather than the MMF component.

Table 1. IYCF Indicator Attainment by Household Wealth Quintile, Indonesia 2024 (%)

Wealth Quintile	MDD (%)	MMF (%)	MAD (%)
Lowest (Q1)	34.9	67.7	23.3
Lower Middle(Q2)	42.4	67.1	28.8
Middle (Q3)	49.1	66.2	33.5
Upper Middle (Q4)	54.7	65.9	37.3
Highest (Q5)	59.3	65.3	40.2

Source: SSGI 2024

Table 2. IYCF Indicator Attainment by Maternal Education Level, Indonesia 2024 (%)

Maternal Education	MDD (%)	MMF (%)	MAD (%)
No Formal Schooling	31.9	62.8	19.9
Unfinished Primary School	32.4	64.9	21.5
Primary School Graduate	37.8	65.8	25.2
Junior High School Graduate	43.5	66.1	29.4
Senior High School Graduate	54.8	66.0	37.0
University Degree	59.7	66.9	41.0

Source: SSGI 2024

CONCLUSION

This study analyzed the association between household economic status, maternal education, and child nutritional attainment in Indonesia using IYCF indicator data from SSGI 2024. The results demonstrate a clear and consistent positive socioeconomic gradient in dietary diversity (MDD) and overall diet adequacy (MAD), both across household wealth quintiles and across maternal education levels, with attainment rates rising substantially from the lowest to the highest strata. Specifically, MAD attainment more than doubles from the lowest to the highest wealth quintile (23.3% to 40.2%), and similarly increases from 19.9% to 41.0% across maternal education levels. In contrast, meal frequency (MMF) shows almost no socioeconomic gradient, suggesting that feeding frequency is far less sensitive to

economic and educational disparities than dietary diversity. These findings confirm that child malnutrition in Indonesia is fundamentally shaped by non-health structural determinants, specifically household economic capacity and maternal human capital, rather than by clinical or biomedical factors alone. The divergent gradient between MDD and MMF indicates that policy interventions should prioritize improving the quality and diversity of children's diets, not merely feeding frequency, which is already relatively uniform across socioeconomic groups. Addressing dietary diversity gaps requires approaches that go beyond the health sector, including economic empowerment of households, targeted food access support for the lowest wealth quintiles, and sustained investment in women's education as a long-term determinant of child nutrition outcomes.

RECOMMENDATION (Optional)

Based on the findings of this study, the following policy recommendations are proposed. First, the national nutrition strategy should explicitly reframe child undernutrition as a multi-sectoral development problem rather than a purely health-sector concern, with formal budget and program coordination between the Ministry of Health, the National Team for the Acceleration of Poverty Reduction (TNP2K), and the Ministry of Education. Second, complementary feeding promotion programs (such as PMBA/Pemberian Makan Bayi dan Anak) should be intensified and redesigned to emphasize dietary diversity through food group diversity counseling and practical demonstration, targeted especially at low-wealth quintile and low-maternal-education households. Third, cash transfer programs (such as PKH) and non-cash food assistance (BPNT/Sembako) should explicitly include complementary feeding components and eligibility rules tied to children's dietary diversity, rather than relying on volume or caloric supplementation alone. Fourth, the education sector should recognize maternal education attainment as a long-term upstream determinant of child nutrition, supporting policies that increase girls' school retention and transition rates as part of the national stunting reduction roadmap.

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