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The Role of Posyandu in Monitoring Toddler Growth and the Prevalence of Stunting in Indonesia

Siti Maisaroh[1], Thahirah[2]
[1,2]Universitas Salakanagara,Tangerang, Indonesia
Email: siti.maisaroh@unsaka.ac.id

Abstract

Background: Posyandu are the primary venues for monitoring the growth of toddlers in the community; however, the national prevalence of stunting remained virtually unchanged from 2022 to 2023. **Objective:** To compare the prevalence of stunting across provinces in the 2022 SSGI and the 2023 SKI and to examine its consistency with trends in growth monitoring indicators at Posyandu. **Methods:** An ecological study using publicly available secondary data from the Ministry of Health. Changes in prevalence across 32 provinces with comparable geographical boundaries were tested using the Wilcoxon test and paired t-tests; regional differences were tested using the Mann–Whitney test; and Posyandu indicators from 2021–2023 were compared descriptively. **Results:** The median provincial prevalence was 21.6% (IQR 18.6–27.0) in 2022 and 22.3% (IQR 17.9–25.3) in 2023 (Wilcoxon p = 0.41); 17 provinces showed a decrease and 15 showed an increase. Only three provinces fell below the 14% target, and provinces outside Java–Bali had a higher median (24.6% vs. 18.0%; p = 0.021). The proportion of toddlers whose growth was monitored increased from 68.9% to 82.2% (2021–2023), while only 55.8% of toddlers were weighed ≥8 times a year. **Conclusion:** Increased administrative coverage of posyandu has not been accompanied by a significant reduction in stunting; strengthening the quality of monitoring, follow-up, and the role of village midwives is necessary.
Keywords: posyandu; stunting; growth monitoring; village midwives; community midwifery care

Abstract

Background: Posyandu is the primary community platform for child growth monitoring in Indonesia; however, the national stunting prevalence remained virtually unchanged between 2022 and 2023. **Objective:** To compare provincial stunting prevalence between the 2022 SSGI and the 2023 SKI and relate it to posyandu growth-monitoring indicators. **Methods:** An ecological study using public secondary data. Changes across 32 provinces with comparable boundaries were analyzed using the Wilcoxon signed-rank test and paired t-tests; regional differences were assessed using the Mann–Whitney test; and national posyandu indicators for 2021–2023 were described. **Results:** The median provincial prevalence was 21.6% (IQR 18.6–27.0) in 2022 and 22.3% (IQR 17.9–25.3) in 2023 (Wilcoxon p = 0.41); 17 provinces showed a decline and 15 showed an increase. Only three provinces fell below the 14% target, and provinces outside Java–Bali had a higher median (24.6% vs. 18.0%; p = 0.021). The proportion of children monitored for growth rose from 68.9% to 82.2% (2021–2023), but only 55.8% were weighed ≥8 times per year. **Conclusion:** Higher administrative posyandu coverage has not been accompanied by a meaningful reduction in stunting; improved monitoring quality, follow-up, and the involvement of village midwives are needed.
Keywords: posyandu; stunting; growth monitoring; village midwife; community midwifery

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Introduction

Stunting—defined as height-for-age below −2 standard deviations from the WHO Child Growth Standards—is an indicator of chronic malnutrition and repeated exposure to infections during the first 1,000 days of life (WHO Multicenter Growth Reference Study Group, 2006). Its impact extends beyond physical stature. Children who are stunted are at higher risk of cognitive developmental disorders, lower educational attainment, reduced economic productivity in adulthood, and an increased risk of noncommunicable diseases later in life (Victora et al., 2008). A series of studies in **The Lancet** on maternal and child nutrition estimates that malnutrition contributes to nearly half of all under-five deaths in low- and middle-income countries (Black et al., 2013).

In Indonesia, the prevalence of stunting among children under five decreased from 37.6% in the 2013 Riskesdas to 30.8% in the 2018 Riskesdas, then to 24.4% in the 2021 Indonesian Nutrition Status Study (SSGI) and 21.6% in the 2022 SSGI (Health Development Policy Agency [BKPK], 2024). However, the 2023 Indonesian Health Survey (SKI) recorded a rate of 21.5%, nearly the same as the previous year, even though the government has set a target of 14% by 2024 through Presidential Regulation No. 72 of 2021 on Accelerating the Reduction of Stunting (Government of the Republic of Indonesia, 2021). Studies on the determinants of stunting indicate that it is influenced by numerous interrelated factors in Indonesia, ranging from maternal height, birth weight, infant and child feeding practices, sanitation, to household socioeconomic status and the region of residence (Beal et al., 2018; Titaley et al., 2019; Torlesse et al., 2016).

Integrated Health Service Posts (posyandu) are the spearhead of community-based health efforts and serve as the primary platform for monitoring the growth of toddlers at the village level. Through monthly weigh-ins, length or height measurements, record-keeping in the Health Progress Card (KMS) or Maternal and Child Health Book (Buku KIA), and health education provided by community health workers and village midwives, posyandu are expected to detect growth disorders early and refer children before stunting occurs. Conceptually, *growth* monitoring and promotion (GMP) is effective only if measurement results are followed up with appropriate counseling and nutritional interventions; measurement alone is insufficient (Ashworth et al., 2008; Mangasaryan et al., 2011). At the field level, mothers' participation in posyandu is influenced by their knowledge, family support, distance, and perceptions of the benefits of the service (Nazri et al., 2016), while the quality of monitoring depends on the knowledge and skills of community health workers, which can be improved through brief training (Siswati et al., 2022).

Village midwives play a central role in community midwifery care because they are responsible for training volunteers, ensuring the accuracy of anthropometric measurements, interpreting growth charts, and liaising between posyandu and community health centers (puskesmas) for nutrition referrals. In recent years, administrative indicators for posyandu have shown rapid improvement, such as the number of districts/cities with active posyandu and the percentage of toddlers whose growth is monitored (Directorate General of Public Health, 2024). The key questions are whether this increase in administrative coverage aligns with a decrease in the

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prevalence of stunting at the provincial level, and how regularly toddlers are actually weighed according to household survey data.

This study aims to (1) compare the prevalence of stunting among toddlers by province between the 2022 SSGI and the 2023 SKI, (2) describe inter-regional disparities, and (3) examine the alignment between trends in growth monitoring indicators at posyandu and national stunting trends, as a basis for strengthening the role of village midwives and community health workers in community midwifery care.

Methods

Study Design. This study is a descriptive-analytical ecological study with provinces as the unit of analysis, using aggregated secondary data publicly released by the Ministry of Health. An ecological design was chosen because individual-level data from the SSGI and SKI are not publicly available, whereas provincial estimates and national program indicators can be downloaded and re-verified by readers.

Data sources. The 2022 provincial stunting prevalence was taken from the 2022 SSGI results for 34 provinces as reported by the Ministry of Health and republished by Annur (2023) and Kompas (2023). The 2023 provincial stunting prevalence was taken from the 2023 SKI for 38 provinces via the 2023 Public Health Profile (Directorate General of Public Health, 2024), the 2023 SKI nutrition fact sheet (BKPK, 2024), and Kompas press releases (2024a, 2024b). Growth monitoring indicators at posyandu from 2021 to 2023 were taken from the 2023 Public Health Profile, while the frequency of weighing and measuring the height of toddlers according to household surveys was taken from the 2023 SKI nutrition fact sheet. A summary of the data sources is presented in Table 1.

Table 1. Research Data Sources

Variable	Year	Coverage	Source
Prevalence of stunting among toddlers by province (%)	2022	34 provinces	SSGI 2022 (Annur, 2023; Kompas, 2023)
Prevalence of stunting among toddlers by province (%)	2023	38 provinces	SKI 2023 (Directorate General of Public Health, 2024; Kompas, 2024a, 2024b)
National Stunting Prevalence Trends (%)	2013–2023	National	Riskesdas, SSGI, SKI (BKPK, 2024)
Toddlers with monitored growth and development (%)	2021–2023	National	2023 Public Health Profile
Districts/cities with ≥80% active posyandu (%)	2021–2023	National	2023 Public Health Profile
Children under 5 weighed ≥8	2023	National	SKI 2023 (BKPK, 2024)

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Variable	Year	Coverage	Source
times and measured for height ≥2 times in 12 months (%)			

Operational definition. Stunting is defined as children aged 0–59 months with a z-score for length or height-for-age below −2 SD based on WHO standards (WHO Multicenter Growth Reference Study Group, 2006). Changes in prevalence are calculated as the difference in percentage points, i.e., the 2023 prevalence minus the 2022 prevalence; a negative value indicates a decrease. Regions were grouped into Java–Bali (DKI Jakarta, West Java, Central Java, DI Yogyakarta, East Java, Banten, Bali) and outside Java–Bali. The national target used as a benchmark is 14%, in accordance with Presidential Regulation No. 72/2021.

Regional harmonization. In 2022, Papua Province was split into Papua, South Papua, Central Papua, and Mountainous Papua, while West Papua was split into West Papua and Southwest Papua. Because the boundaries of Papua and West Papua in 2023 differed from those in 2022, these two provinces were excluded from the paired analysis; thus, the analysis of changes covered 32 provinces with fixed boundaries. The four new autonomous regions in Papua were still presented descriptively for 2023.

Data analysis. Provincial prevalence was summarized using the median and interquartile range (IQR) because the distribution was asymmetric. Paired changes from 2022 to 2023 were tested using the Wilcoxon signed-rank test and, as a sensitivity analysis, the paired t-test. The relationship between baseline prevalence and the magnitude of change was assessed using Spearman's correlation to determine whether provinces with a high burden declined more rapidly. Differences in 2023 prevalence between Java–Bali and outside Java–Bali were tested using the Mann–Whitney test. Posyandu indicators were presented as national trends and descriptively compared with stunting trends as well as with the frequency of weigh-ins according to the survey. All tests were two-tailed with $\alpha = 0.05$ and analyzed using Python 3 (SciPy library).

Design limitations. The 2022 SSGI and 2023 SKI differ in sampling frames and sample sizes; thus, some year-over-year changes may reflect differences in survey methodology rather than actual changes. Posyandu data by province are not publicly available, so the relationship between posyandu performance and stunting cannot be tested at the provincial level. As an ecological study, these findings cannot be generalized to the individual level. This study used publicly available aggregate data without individual identifiers; therefore, no ethical approval was required.

Results

National stunting trends and posyandu indicators. The national prevalence of stunting decreased from 37.6% (2013) to 30.8% (2018), 27.7% (2019), 24.4% (2021), and 21.6% (2022), and remained virtually unchanged in 2023 (21.5%). During the same period, administrative indicators for Posyandu improved across nearly all areas (Table 2). The percentage of toddlers whose growth and development were monitored rose from 68.9% to 82.23% and exceeded the target every year; the number of districts/cities

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implementing Posyandu guidelines increased from 47.67% to 83.07%; and the percentage of districts/cities with ≥80% active posyandu centers surged from 6.03% to 82.68%. However, the 2023 SKI household survey showed that only 55.8% of toddlers were weighed ≥8 times in the past 12 months, even though 85% of toddlers had their height measured at least twice.

Table 2. Growth monitoring indicators at posyandu and national stunting prevalence, 2021–2023

Indicator	2021	2022	2023	2023 Target
Toddlers monitored for growth and development (%)	68.90	78.30	82.23	80
Districts/cities implementing Posyandu guidelines (%)	47.67	65.95	83.07	100
Districts/cities with ≥80% active posyandu (%)	6.03	48.44	82.68	–
National prevalence of stunting among toddlers (%)	24.4	21.6	21.5	14 (2024)

Note: Sources: Directorate General of Public Health (2024) and BKPK (2024).

Interprovincial changes in stunting, 2022–2023. Across 32 provinces with comparable territorial boundaries, the median prevalence of stunting was 21.6% (IQR 18.6–27.0) in 2022 and 22.3% (IQR 17.9–25.3) in 2023 (Table 3). The mean difference of −0.56 percentage points (SD 2.79) was not statistically significant (Wilcoxon p = 0.41; paired t-test p = 0.27). A total of 17 provinces experienced a decrease and 15 provinces experienced an increase (Figure 1). If Papua and West Papua are included, the number of provinces showing a decrease rises to 19, in accordance with the 2023 Public Health Profile report.

Table 3. Prevalence of stunting among toddlers in 32 provinces with comparable territorial boundaries, SSGI 2022 and SKI 2023

Measure	SSGI 2022	SKI 2023	Test
Median (IQR), %	21.6 (18.6–27.0)	22.3 (17.9–25.3)	Wilcoxon p = 0.41
Range, %	8.0–35.3	7.2–37.9	–
Mean difference (SD), points	−0.56 (2.79)		t-test p = 0.27
Province: Decrease / Increase	17 / 15		–
Correlation between initial prevalence and change	ρ = −0.25		p = 0.16

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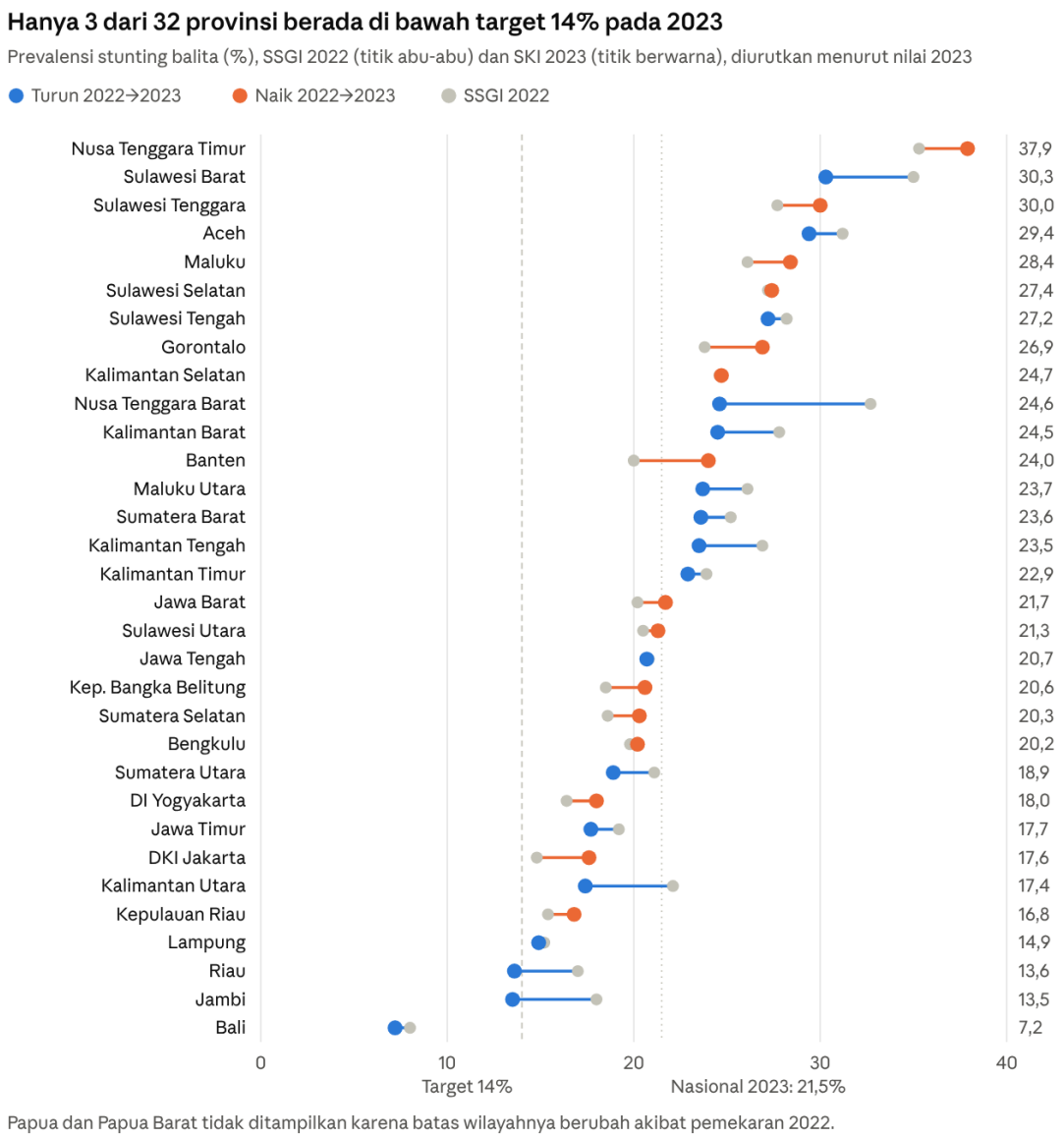


Figure 1. Only 3 of 32 provinces fell below the 14% target in 2023. Source: SSGI 2022 and SKI 2023, compiled by the author

The largest decreases occurred in West Nusa Tenggara (−8.1 points), West Sulawesi and North Kalimantan (−4.7 each), and Jambi (−4.5). The largest increases were recorded in Banten (+4.0), Gorontalo (+3.1), DKI Jakarta (+2.8), and East Nusa Tenggara (+2.6). Provinces with higher initial prevalence tended to show larger decreases, but this relationship was not statistically significant ($\rho = -0.25$; $p = 0.16$).

Regional disparities and target achievement. In 2023, only three provinces fell below the 14% target: Riau (13.6%), Jambi (13.5%), and Bali (7.2%). Six provinces still had a prevalence of ≥30%: Central Papua (39.4%), East Nusa Tenggara (37.9%), Mountainous Papua (37.3%), Southwest Papua (31.0%), West Sulawesi (30.3%), and Southeast Sulawesi (30.0%). The median prevalence in the Java–Bali region (18.0%)

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was lower than that in provinces outside the Java–Bali region (24.6%; Mann–Whitney p = 0.021).

Discussion

Administrative coverage has increased, but stunting remains unchanged. The main finding of this study is the discrepancy between improvements in posyandu indicators and the stagnation of stunting. Between 2021 and 2023, the percentage of toddlers whose growth was monitored rose by more than 13 percentage points, and the percentage of districts/cities with active posyandus increased from 6.03% to 82.68%, but the national prevalence of stunting changed only slightly from 21.6% to 21.5% in the last year, and changes across provinces from 2022 to 2023 were not statistically significant. This pattern is consistent with the review by Ashworth et al. (2008), which states that growth monitoring is effective only when linked to adequate counseling and follow-up, as well as with the assertion by Mangasaryan et al. (2011) that growth monitoring should be understood as a gateway to nutritional interventions, not an end in itself. In other words, the "monitored" indicator measures whether a child is recorded, not whether their growth issues are addressed.

Quality gap: regularity of weighing and follow-up. The 2023 SKI figures, which show that only 55.8% of toddlers were weighed ≥8 times a year, indicate that the majority of toddlers are not being monitored regularly on a monthly basis, even though administrative coverage appears high. This discrepancy is understandable because administrative indicators count children monitored at least once, whereas the early detection of growth faltering requires repeated measurements that form a growth curve. Factors influencing maternal attendance include knowledge, family support, ease of access, and perceived benefits (Nazri et al., 2016). From the service provider's perspective, the accuracy of measurements and interpretations depends heavily on the competence of health volunteers; brief training has been shown to improve volunteers' knowledge of growth and development monitoring as well as home visits (Siswati et al., 2022). The role of village midwives as mentors to these volunteers is therefore strategic: supportive supervision, calibration of measuring instruments, and clear referral pathways from posyandu to community health centers.

Determinants beyond the posyandu. The stagnation in stunting rates also serves as a reminder that posyandus address only a portion of the determinants of stunting. Beal et al. (2018) demonstrated that stunting in Indonesia is influenced by maternal height, birth weight, feeding practices, sanitation, and poverty; Titaley et al. (2019) and Torlesse et al. (2016) found that household and regional factors—such as poverty, maternal education, access to sanitation, and area of residence—remain strongly associated with stunting even after accounting for child-related factors. This is consistent with the findings of regional disparities in this study: provinces outside Java–Bali have a higher prevalence (median 24.6% vs. 18.0%), and the provinces with the highest burden are in Nusa Tenggara, western and southeastern Sulawesi, and Papua. Because the causes of stunting are multisectoral, posyandu programs need to be integrated with improvements in maternal nutrition during pregnancy, appropriate

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breastfeeding and complementary feeding, sanitation, and social protection so that their benefits are reflected in prevalence rates (Black et al., 2013).

Interpretation of interprovincial changes. The small and variable changes from 2022 to 2023 (ranging from −8.1 to +4.0 points) should be interpreted with caution. In addition to being influenced by program efforts, significant changes in a single province—such as the decline in West Nusa Tenggara or the increase in Banten—may be affected by survey sampling errors and methodological differences between the SSGI and SKI. Therefore, this study does not conclude that programs in specific provinces have succeeded or failed, but rather that, at the aggregate level, there is no evidence of consistent change. The rapid initial decline from 2018 to 2022 also indicates that progress becomes increasingly difficult to achieve as prevalence approaches the most vulnerable household groups.

Implications for community midwifery care. First, village midwives need to shift their focus from weighing coverage to the accuracy of results and follow-up: children with stunted weight gain or below-standard height should receive feeding counseling, screening for comorbidities, and appropriate referrals. Second, training for community health workers and regular supervision are needed to maintain the quality of measurements (Siswati et al., 2022). Third, posyandu data at the provincial and district levels should be made publicly available so that the relationship between posyandu performance and stunting can be evaluated at a more granular level.

Limitations. This study is ecological in nature and uses aggregated data; therefore, it cannot draw causal conclusions. Posyandu indicators are only available at the national level. Differences in the design of the SSGI and SKI surveys may affect year-over-year changes. Two provinces (Papua and West Papua) were excluded due to administrative reorganization, and some of the 2023 SKI values were obtained from graphs and official fact sheets rather than from raw data tables; additionally, the value for Central Papua was recorded as 39.4% in the graph but 38.4% in the narrative of the same document. Future research should use district-level data or individual SKI data to examine the relationship between posyandu attendance and stunting.

Conclusion

Improvements in administrative posyandu indicators from 2021 to 2023 were not accompanied by a significant reduction in stunting: the national prevalence remained stagnant at 21.6% and 21.5%, changes across provinces were not statistically significant ($p = 0.41$), only three of 32 provinces fell below the 14% target, and only 55.8% of toddlers were weighed ≥8 times a year. Regional disparities remain wide, with the highest burden outside of Java–Bali. Village midwives and community health workers need to strengthen the quality of monitoring—specifically, the regularity of weigh-ins, measurement accuracy, counseling, and referrals—and collaborate with other sectors to address determinants of stunting beyond health services. The availability of open posyandu data at the provincial and district levels is necessary for a more robust evaluation.

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