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Exclusive Breastfeeding in the Community and the Socioeconomic Factors That Influence It

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Abstrak

Background: Exclusive breastfeeding protects infants, but its coverage varies widely across provinces in Indonesia, and this variation is often attributed to socioeconomic factors. Comprehensive tables on exclusive breastfeeding by province are not publicly available; therefore, this analysis focuses on the provinces with the highest and lowest rates. **Objective:** To describe the 2022 exclusive breastfeeding coverage in provinces with extreme rates and to assess its association with poverty and the Human Development Index (HDI). **Methods:** An ecological study involving 19 provinces (9 with the highest and 10 with the lowest rates) for the 2022 exclusive breastfeeding coverage among infants aged 0–5 months, based on data published by the Central Statistics Agency (BPS). The 2022 poverty rates and HDI were obtained from the 2022 Indonesia Health Profile. Groups were compared using the Mann–Whitney test, and associations were assessed using Spearman's correlation, with 95% Fisher-z confidence intervals (CI), accompanied by a sensitivity analysis excluding West Papua. National figures for 2021–2023 are presented for comparison. **Results:** National figures were 71.58% (2021) and 72.04% (2022); the 2023 SKI reported 68.6% using a different methodology. The median exclusive breastfeeding rate was 77.0% in the highest-ranking province and 61.7% in the lowest-ranking province; the range was from 53.60% (Gorontalo) to 79.69% (West Nusa Tenggara). Poverty (median 11.44% vs. 7.84%; $p = 0.307$) and HDI (72.79 vs. 72.04; $p = 0.713$) did not differ significantly between the two groups. The correlation with poverty was $\rho = 0.12$ (95% CI −0.35 to 0.55) and with the HDI was $\rho = 0.15$ (95% CI −0.33 to 0.57). East Nusa Tenggara has a poverty rate of 20.23% but an exclusive breastfeeding rate of 78.56%, while the Riau Islands have a poverty rate of 6.03% and an HDI of 76.46 but an exclusive breastfeeding rate of 62.40%. **Conclusion:** Based on this limited data, provincial-level poverty and HDI do not explain the differences in exclusive breastfeeding coverage; other factors at the community and service levels need to be examined using individual-level data.
Keywords: exclusive breastfeeding; socioeconomic factors; poverty; Human Development Index; province; Indonesia

Introduction

Breastfeeding is a public health practice with wide-ranging benefits. A review of the evidence concludes that breastfeeding protects infants from infections and benefits mothers, and that its effects extend far beyond infancy (Victora et al., 2016). A review of the literature on breastfeeding investment confirms that this practice depends not only on a mother's decision but also on a supportive environment, including the health system, community support, and policies (Rollins et al., 2016). Thus, regional

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differences in coverage should be examined as a result of the conditions surrounding mothers, rather than solely individual choice.

In Indonesia, the coverage of exclusive breastfeeding among infants aged 0–5 months was reported at 71.58% in 2021 (Rizaty, 2022) and 72.04% in 2022 (Annur, 2023). The 2023 Indonesian Health Survey (SKI) reported a rate of 68.6% (Health Development Policy Agency [BKPK], 2024). The SKI figures are derived from a survey using a different methodology and therefore cannot be directly compared with figures from previous years. These national figures mask significant differences between provinces: in 2022, coverage in West Nusa Tenggara reached 79.69% (Lase, 2023), while in Gorontalo it was only 53.60% (Annur, 2023).

Regional disparities are often attributed to socioeconomic factors such as poverty and human development levels. The socioeconomic factors determining exclusive breastfeeding in eastern Indonesia have been reexamined in the literature (Lo Bue & Priebe, 2017), but it remains unclear whether provincial-level socioeconomic indicators—which are easily accessible and frequently used to set priorities—truly distinguish between provinces with high and low coverage. Furthermore, comprehensive tables on exclusive breastfeeding for all 34 provinces are not available as verifiable open data; therefore, the analysis could only include the provinces mentioned in the published data.

This article aims to (1) describe national trends in exclusive breastfeeding from 2021 to 2023; (2) compare poverty and the Human Development Index (HDI) between provinces with the highest and lowest rates of exclusive breastfeeding in 2022; (3) assess the association between exclusive breastfeeding and poverty and the HDI; and (4) examine whether provinces with low performance in 2021 remained low in 2022. The results are expected to help midwives and community health workers determine whether breastfeeding support should be prioritized based on regional poverty or other factors.

Methods

Design. This study is a cross-sectional ecological study with provinces as the unit of analysis. All data are secondary, aggregated, and publicly available; therefore, ethical approval was not required. The results describe interprovincial differences and cannot be interpreted at the individual mother level.

Data Sources. The 2022 exclusive breastfeeding coverage rates were drawn from two data publications citing the Central Statistics Agency (BPS) as the source: a list of the top ten provinces (Lase, 2023) and the bottom ten provinces (Annur, 2023). In the list of the highest-ranking provinces, one province was referred to only as “Kalimantan” without a full name and was excluded; thus, the nine highest-ranking and ten lowest-ranking provinces (n = 19) were analyzed. The 2021 national figure was taken from Rizaty (2022) and the 2022 figure from Annur (2023), while the 2023 SKI figure was taken from BKPK (2024). The 2021 figures for five provinces (Gorontalo, Central Kalimantan, North Sumatra, West Papua, and Riau Islands) were taken from Rizaty (2022). The 2022 percentages of the poor population and HDI by province were taken

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from the appendix to Chapter 1 of the 2022 Indonesian Health Profile (Ministry of Health of the Republic of Indonesia, 2023). A summary of the sources is presented in Table 1.

Table 1. Research Data Sources

Indicator	Coverage	Year	Source
Exclusive breastfeeding of infants aged 0–5 months (%)	Top 9 provinces	2022	Lase (2023)
Exclusive breastfeeding of infants aged 0–5 months (%)	10 provinces with the lowest rates	2022	Annur (2023)
Exclusive breastfeeding of infants aged 0–5 months (%)	National; 5 provinces	2021	Rizaty (2022)
Exclusive breastfeeding of infants aged 0–5 months (%)	National	2023	BKPK (2024)
Poor population (%) and HDI	34 provinces	2022	Ministry of Health of the Republic of Indonesia (2023)

Operational definitions. Exclusive breastfeeding is the percentage of infants aged 0–5 months who are exclusively breastfed. The “highest” and “lowest” groups follow the source publication’s classification. The poor population is the percentage of the population below the poverty line, and the HDI is the composite human development index at the provincial level.

Statistical analysis. The median and interquartile range (IQR) were used because the data distribution was not assumed to be normal. Poverty and HDI were compared between the highest and lowest groups using the Mann–Whitney test. The association between exclusive breastfeeding and poverty and the HDI was assessed using Spearman’s correlation (ρ), with a 95% confidence interval (CI) based on the Fisher-z transformation and the Bonett–Wright standard error, which is the square root of $(1 + \rho^2/2)/(n - 3)$. A sensitivity analysis recalculated the correlation excluding West Papua, the province with the highest poverty rate in the analysis group. Changes from 2021 to 2022 were calculated as the difference in percentage points for five provinces. The significance level was set at a two-sided $p < 0.05$, and the analysis was performed using Python 3 with SciPy.

Design limitations. First, provinces were selected based on outcome values (highest and lowest), so the range of outcomes is wide and the correlations may deviate from those observed across all provinces. Second, with n = 19, the statistical power is low; thus, non-significant results do not prove the absence of an association. Third, the figures for exclusive breastfeeding were taken from secondary data publications citing BPS and should be verified against BPS tables. Fourth, poverty and the Human Development Index (HDI) are provincial measures and do not reflect the conditions of the mothers’ households.

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Results

National trends. The rate of exclusive breastfeeding among infants aged 0–5 months was 71.58% in 2021 (Rizaty, 2022) and 72.04% in 2022 (Annur, 2023), an increase of 0.46 percentage points. The 2023 SKI figure of 68.6% (BKPK, 2024) cannot be directly compared with these two figures because it comes from a survey using a different methodology.

Extreme provinces in 2022. The nine highest-ranking provinces had a median exclusive breastfeeding rate of 77.0% (IQR 76.6–78.6), while the ten lowest-ranking provinces had a median of 61.7% (IQR 57.8–62.7). The lowest value in the highest group (74.67%, West Sulawesi) was 10.1 percentage points higher than the highest value in the lowest group (64.59%, South Kalimantan), and the range across all analyzed provinces was 26.1 percentage points, from Gorontalo (53.60%) to West Nusa Tenggara (79.69%) (Figure 1). Nine of the ten provinces with the lowest rates had coverage below 64%, and the nine provinces with the highest rates were all above the national average of 72.04%.



Figure 1. Provinces with high and low rates of exclusive breastfeeding are not differentiated by poverty. Source: Lase (2023); Annur (2023); Ministry of Health of the Republic of Indonesia (2023)

Poverty and HDI. The two groups did not differ significantly in terms of poverty or HDI (Table 2). Provinces with high poverty rates are distributed across both groups: East Nusa Tenggara (20.23%) and West Nusa Tenggara (13.82%) are in the highest group, while West Papua (21.43%), Maluku (16.23%), and Gorontalo (15.51%) are in the lowest group. Conversely, Riau Islands (poverty rate 6.03%; HDI 76.46) and East

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Kalimantan (6.44%; HDI 77.44) have high HDI scores but fall into different groups, with exclusive breastfeeding rates of 62.40% and 76.58%, respectively.

Table 2. Comparison of Provinces with the Highest and Lowest Rates of Exclusive Breastfeeding

Variable	Highest (n = 9), median (IQR)	Lowest (n = 10), median (IQR)	p
Exclusive breastfeeding 2022 (%)	77.0 (76.6–78.6)	61.7 (57.8–62.7)	–
Poor Population 2022 (%)	11.44 (8.66–11.92)	7.84 (5.42–14.45)	0.307
HDI 2022	72.79 (69.46–73.12)	72.04 (70.57–72.59)	0.713

Associations. In 19 provinces, exclusive breastfeeding was weakly and non-significantly correlated with poverty (ρ = 0.12; 95% CI −0.35 to 0.55; p = 0.611) and with the HDI (ρ = 0.15; 95% CI −0.33 to 0.57; p = 0.547). After excluding West Papua, the correlation with poverty was ρ = 0.24 (95% CI −0.26 to 0.64; p = 0.336) and with the HDI was ρ = 0.07 (95% CI −0.41 to 0.52; p = 0.779). The sign of the correlation with poverty is positive, meaning that poorer provinces tend to have slightly higher rates of exclusive breastfeeding, but the uncertainty is high.

Continuity from 2021 to 2022. Of the five provinces with data for both years (Table 3), Gorontalo, Central Kalimantan, and North Sumatra remained among the lowest, with changes of less than 1 percentage point, while West Papua and the Riau Islands increased by 3.02 and 3.56 percentage points but remained below 63%.

Table 3. Exclusive breastfeeding coverage in 2021 and 2022 across five provinces

Province	2021 (%)	2022 (%)	Change (percentage points)
Gorontalo	52.75	53.60	+0.85
Central Kalimantan	55.98	55.26	−0.72
North Sumatra	57.83	57.17	−0.66
West Papua	58.77	61.79	+3.02
Riau Islands	58.84	62.40	+3.56

Discussion

A large disparity exists, but it does not correlate with poverty and the HDI. The 26.1 percentage-point difference between Gorontalo and West Nusa Tenggara indicates that the national figure of 72.04% masks significant variations. Provinces with high poverty rates and low HDI do not automatically have low rates of exclusive

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breastfeeding: East Nusa Tenggara (poverty rate 20.23%; HDI 65.90) reached 78.56%, while Riau Islands (poverty rate 6.03%; HDI 76.46) was only 62.40%. The correlations with poverty ($\rho = 0.12$) and the HDI ($\rho = 0.15$) are small and not statistically significant, with a wide confidence interval encompassing both negative and positive values. These findings do not imply that socioeconomic factors are unimportant. At the individual level, socioeconomic determinants of breastfeeding in eastern Indonesia have indeed been the focus of research (Lo Bue & Priebe, 2017), but provincial averages may mask differences among households within the same province. With 19 provinces and a selection based on outcome values, this analysis is only sufficient to state that there is no evidence of a strong association at the provincial level.

Environmental factors related to breastfeeding are likely more decisive. Studies on investments in breastfeeding emphasize that breastfeeding practices are influenced by the health system, community support, and policies—not just by the mothers themselves (Rollins et al., 2016). This aligns with the pattern observed here, where provinces with similar poverty burdens are spread across both ends of the distribution. Other possible but untested explanations include differences in local norms, support in the early postpartum period, marketing of breast milk substitutes, and the quality of data recording. Data quality is important because the figures are derived from secondary data publications and may vary across sources, as evidenced by the 2023 SKI figure (68.6%), which differs from the 2022 figure (72.04%) due to different methodologies.

Provinces with low performance tend to remain stagnant. Gorontalo, Central Kalimantan, and North Sumatra remained in the lowest group with changes of less than 1 percentage point from 2021 to 2022, while West Papua and the Riau Islands improved by about 3 percentage points. With only five provinces, this observation is anecdotal, but it suggests that the gap is not a one-year fluctuation. Given the benefits of breastfeeding for infants and mothers (Victora et al., 2016), provinces that remain in the lowest tier warrant targeted breastfeeding support.

Implications for community health services. Priorities for breastfeeding support should not be determined solely by poverty maps or the Human Development Index (HDI). Midwives and community health workers can begin by mapping exclusive breastfeeding coverage by district and subdistrict, identifying local barriers, and providing support during the early postpartum period—in line with calls for a supportive environment (Rollins et al., 2016). Publishing complete tables of exclusive breastfeeding rates by province and household characteristics would enable more robust analysis.

Limitations. First, only 19 of 34 provinces were analyzed and selected based on outcome values, so the correlations do not represent all provinces. Second, fifteen other provinces (including one province with the highest rate, which remains unnamed) were not analyzed because their data were not publicly available. Third, the exclusive breastfeeding figures are derived from secondary data publications and have not been verified against BPS tables. Fourth, poverty and the Human Development Index (HDI) are provincial measures, while maternal education, employment, household wealth, and rural–urban status are not available. Fifth, ecological analysis does not allow for conclusions about individuals.

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Conclusion

Exclusive breastfeeding coverage in 2022 ranged from 53.60% (Gorontalo) to 79.69% (West Nusa Tenggara) in the highest- and lowest-performing provinces, respectively; however, provincial poverty rates and HDI scores did not distinguish between the two groups (p = 0.307 and 0.713) and showed a weak correlation with exclusive breastfeeding (ρ = 0.12 and 0.15). Provinces with low performance tended to remain so from 2021 to 2022. Priorities for breastfeeding support should therefore be determined using more detailed coverage data and by examining community and service factors, rather than relying solely on poverty indicators. Future research should use individual-level data from SKI or Susenas to examine household socioeconomic factors.

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