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The Role of Midwives in Childbirth at Health Facilities: An Analysis of Trends in Childbirth Attendants in Indonesia, 2017–2023

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Abstract

Background. Childbirth attended by health care providers at health care facilities is a key strategy for reducing maternal mortality. Midwives are the most common birth attendants in Indonesia, but current policies emphasize that all births should take place at health care facilities.

Objectives. To describe trends in birth attendants and delivery settings in Indonesia from 2013 to 2023, the proportion of midwives as birth attendants, and interprovincial disparities between births attended by health workers and births occurring at health care facilities.

Methods. A descriptive-analytical study using trend analysis and Spearman's correlation on downloadable secondary data: Riskesdas 2013 and 2018, SDKI 2017, the 2023 Indonesian Health Survey (SKI), and the 2020 Indonesian Health Profile for data from 33 provinces, as well as the 2020 Population Census (SP2020) Long Form on maternal mortality.

Results. Deliveries at health facilities increased from 66.7% (2013) to 79.3% (2018) and 90% (2023), while deliveries attended by health personnel reached 96.1% in 2023. Midwives assisted in about six out of ten births (61% in the 2017 SDKI; 62.7% in the 2018 Riskesdas), while obstetricians accounted for about 29%. According to routine data from 2020, the coverage of deliveries at health facilities ranged from 31.4% in Maluku to 99.6% in DKI Jakarta, and 12 out of 33 provinces remained below 80%. The rate of deliveries at health facilities showed a strong negative correlation with the Long Form SP2020 maternal mortality rate (rho = −0.69; $p < 0.001$; $n = 20$).

Conclusion. Midwives remain the backbone of childbirth care, and their role has shifted from providing care at home to providing care at health facilities and serving as referral liaisons. Provinces in eastern Indonesia require support to ensure that midwife-assisted deliveries can take place at health facilities.

Keywords: midwife, birth attendant, facility-based childbirth, SDKI, SKI 2023, Riskesdas

Introduction

Most maternal deaths occur around the time of delivery and within the first 24 hours afterward. Postpartum hemorrhage, preeclampsia, prolonged labor, and infections can develop within hours, so maternal safety depends heavily on who assists with the delivery and where it takes place (Campbell & Graham, 2006). Consequently, the proportion of births attended by trained health personnel serves as an indicator for SDG 3.1.2, and births occurring in health care facilities (fasyankes) are a key indicator of maternal health programs in Indonesia (Ministry of Health of the Republic of Indonesia [Kemenkes RI], 2021a).

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Midwives have played a central role in the history of childbirth care in Indonesia. The program to station midwives in villages, launched in the early 1990s, led to the fastest increase in professional-assisted births among the poorest groups—approximately 11% per year—thereby drastically narrowing socioeconomic disparities in childbirth care (Hatt et al., 2007). However, the same study found that access to emergency obstetric care—as indicated by cesarean section rates—has actually become more unequal between the rich and the poor.

This experience demonstrates that having trained birth attendants alone is not sufficient. An analysis of the 1994–2007 SDKI data found that home births attended by trained personnel did not reduce the risk of early neonatal death compared to home births attended by untrained personnel, and in rural areas the risk was even higher (Titaley et al., 2012). Complications such as severe hemorrhage require uterotonics, intravenous fluids, blood transfusions, and sometimes surgical procedures that are only available at health facilities. Therefore, Ministry of Health Regulation No. 97 of 2014 stipulates that childbirth must take place at health facilities, and this policy direction is maintained in Ministry of Health Regulation No. 21 of 2021 (Indonesian Ministry of Health, 2014, 2021b).

These policy changes have altered the role of midwives. Law No. 4 of 2019 on Midwifery affirms midwives' authority in providing care for normal deliveries, whether at community health centers (puskesmas), clinics, or Midwife Independent Practice Sites (TPMB), which are also classified as health facilities. Analysis of the Demographic and Health Survey (SDKI) shows that the proportion of births attended by midwives rose from 69.3% in 2012 to 73.5% in 2017, and midwives are most frequently chosen by young mothers, mothers in rural areas, and mothers with uncomplicated normal deliveries (Adnani et al., 2025).

Nevertheless, the utilization of health facilities for childbirth remains uneven. Only 71.6% of women in eastern Indonesia give birth at health facilities, with a significant disparity between urban (87.8%) and rural (63.5%) areas (Efendi et al., 2020). Traditional practices and a high density of traditional birth attendants reduce the likelihood of giving birth at health facilities, even among mothers who have completed their antenatal visits (Aryastami & Mubasyiroh, 2021). Financial factors also play a role: enrollment in the Jamkesmas health insurance program increases the likelihood of giving birth at a health facility among poor women, but barriers such as distance, staff shortages, and cultural factors persist (Brooks et al., 2017). On the other hand, participation in prenatal classes nearly triples the likelihood of giving birth at a health facility (Azhar et al., 2020).

At the same time, the proportion of obstetricians and the cesarean section rate continue to rise globally (Betrán et al., 2016). In Indonesia, the availability of obstetricians at the provincial level is associated with better referral practices but also with higher cesarean section rates (Wenang et al., 2024). This situation raises questions about the role of midwives in assisting with normal deliveries.

Most previous studies have analyzed individual determinants from a single survey. An overview of trends across national surveys combined with interprovincial comparisons remains limited. This study aims to: (1) describe trends in deliveries attended by health personnel and deliveries at health facilities in Indonesia from 2013 to 2023; (2) describe the proportion of midwives compared to other birth attendants; and (3) compare the

coverage of births attended by health personnel and at health facilities across provinces to identify regions where births attended by health personnel still occur outside health facilities.

Methods

Study Design. This study is a descriptive-analytical quantitative study with two components: (1) a *repeated cross-sectional* trend analysis across national surveys from 2013 to 2023, and (2) a cross-provincial ecological cross-sectional analysis for the year 2020.

Population and sample. The trend component used national estimates from published nationwide household surveys. The provincial component covers all 34 provinces in Indonesia according to the 2020 administrative division (*total sampling*). Gorontalo was excluded because data on births attended by health personnel were not reported; thus, 33 provinces were analyzed. The analysis of the relationship with the MMR covers 20 provinces that have Long Form MMR values from the 2020 Population Census (SP2020) available in open-access sources.

Data sources and collection. All data are aggregated secondary data downloaded from official websites in October 2026:

Table 1. Research data sources

Source	Year	Data Used	Data Type
Riskesdas (Indonesian Ministry of Health, 2019; Katadata, 2021)	2013, 2018	Childbirth at health facilities; type of birth attendant	Household survey
SDKI (Adnani et al., 2025; BKKBN et al., 2018)	2012, 2017	Deliveries attended by health personnel; type of attendant; proportion of midwives	Household survey
SKI (Health Development Policy Agency, 2024a, 2024b)	2023	Deliveries attended by health workers; deliveries at health facilities	Household survey
Indonesia Health Profile (Ministry of Health of the Republic of Indonesia, 2021a)	2020	Deliveries Assisted by Health Workers and at Health Facilities by Province (Appendix 23.a)	Routine reports from health departments
SP2020 Long Form (Central Statistics Agency, 2023; Kompas.com, 2024a, 2024b)	2020	MMR by province	Census-based estimates

Operational definitions.

Table 2. Operational definitions of variables

Variable	Definition	Scale
Deliveries Assisted by Healthcare Personnel	Percentage of deliveries assisted by an obstetrician, general practitioner, midwife, or nurse	Ratio (%)

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Variable	Definition	Scale
Deliveries at health facilities	Percentage of deliveries in hospitals, community health centers, clinics, or TPMBs relative to the target number of mothers giving birth	Ratio (%)
Type of birth attendant	Proportion of births by the highest category of birth attendant providing care	Nominal (%)
Deliveries by health workers outside health facilities	Difference in coverage between births attended by health workers and births at health facilities	Ratio (percentage points)
MMR LF 2020 Census	Estimated pregnancy-related deaths per 100,000 live births	Ratio

Data processing and analysis. Data were processed using Python 3 (pandas and SciPy libraries). National trends were analyzed descriptively by calculating absolute changes (percentage points) between surveys; the 2018 Riskesdas and the 2023 SKI used comparable methods, allowing for direct comparison (Health Development Policy Agency, 2024b). Provincial data are presented using the median and interquartile range (IQR), as well as a *dumbbell* plot. The relationship between delivery coverage and MMR was analyzed using Spearman's rank correlation (α = 0.05) because the data were not normally distributed, accompanied by 95% confidence intervals (Fisher-z transformation, Bonett–Wright standard error). A sensitivity analysis was conducted by excluding provinces with inconsistent data (East Kalimantan, Riau, and West Sulawesi).

$$z = \frac{1}{2}\ln\left(\frac{1+\rho}{1-\rho}\right), \qquad SE = \frac{1{,}06}{\sqrt{n-3}} \tag{1}$$

$$\text{IK } 95\% = \tanh\left(z \pm 1{,}96 \times SE\right) \tag{2}$$

Research ethics. This study used publicly available aggregate data without individual identifiers; therefore, no ethical approval was required. If the target journal requires it, the researchers may submit a request for *an ethical exemption* to the institutional ethics committee.

Results

Births at health facilities increased by 23 percentage points over ten years. Household surveys show a consistent increase, and by 2023, nine out of ten births were taking place at health facilities.

Table 3. Trends in deliveries attended by health workers and at health facilities, national survey

Survey	Deliveries Assisted by Health Workers (%)	Births at health facilities (%)
Riskesdas 2013		66.7
SDKI 2017	91	
2018 Riskesdas	93.1	79.3
SKI 2023	96.1	90

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An empty cell indicates that the figure could not be obtained from accessible publications. The 2018 Riskesdas rate of deliveries attended by health personnel (93.1%) was calculated by summing the proportions of midwives, obstetricians, general practitioners, and nurses in Table 4.

Midwives assist in about six out of ten births. The proportion of midwives remained relatively stable between the 2017 SDKI and the 2018 Riskesdas, while obstetricians assisted in about three out of ten births.

Table 4. Type of birth attendant (%)

Attendant	2017 SDKI	2018 Riskesdas
Midwives	61	62.7
Obstetricians and Gynecologists (SpOG)	29	28.9
General practitioner	1	1.2
Nurse		0.3
Traditional midwife		6.2
No helper		0.7

Further analysis of the SDKI shows that the proportion of births attended by midwives rose from 69.3% in the 2012 SDKI to 73.5% in the 2017 SDKI (Adnani et al., 2025). The 2023 SKI also recorded that 25.9% of deliveries were performed via cesarean section (GoodStats, n.d.), the majority of which were handled by specialists in hospitals.

Disparities among provinces remain significant. Routine data from 2020 show that provinces in Java, Bali, and West Nusa Tenggara (NTB) have reached nearly 100% of births occurring in health facilities. In contrast, Maluku, West Papua, Papua, and East Nusa Tenggara (NTT) remain below 61%.

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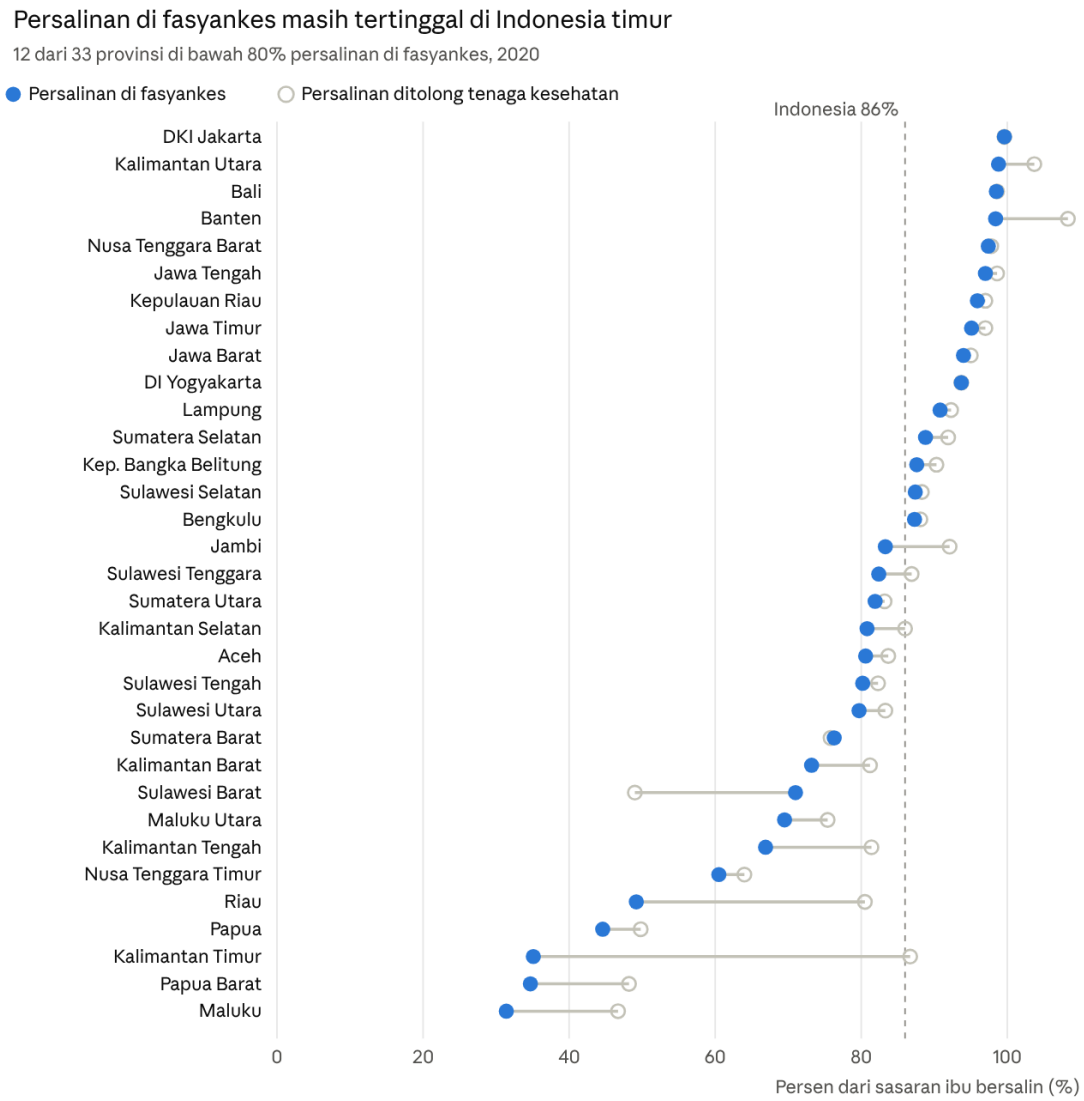


Figure 1. Childbirth in health facilities still lags behind in Eastern Indonesia. Source: Indonesia Health Profile 2020, Appendix 23.a (Ministry of Health) · 33 provinces; Gorontalo not reported

The gap between the open point and the blue point indicates births attended by health workers but not at health facilities, which generally means births attended by midwives at home. This gap is largest in Maluku (15.3 points), Central Kalimantan (14.5 points), and West Papua (13.5 points). East Kalimantan and Riau show very large gaps (51.6 and 31.3 points), but the same pattern also appears in the K4 data for these two provinces, suggesting that this likely reflects a data recording issue. West Sulawesi reports a higher number of births at health facilities than births attended by health workers, which also indicates data inconsistency. Coverage rates above 100% (Banten, North Kalimantan) occurred because the denominator used target projections.

The median coverage of births at health facilities across provinces is 82.4% (IQR 71.0–94.0), and 12 of 33 provinces remain below 80%.

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Delivery coverage is strongly associated with MMR. In the 20 provinces with MMR data from the 2020 Population and Housing Census (SP2020), the higher the coverage of deliveries attended by health workers and at health facilities, the lower the MMR.

Table 5. Spearman's correlation between the 2020 delivery coverage rate and the MMR from the 2020 Population and Housing Census

Variable pairs	n	rho	95% CI	p
Deliveries by healthcare professionals vs. maternal mortality	20	−0.80	−0.92 to −0.53	< 0.001
Childbirth at a health facility vs. maternal mortality	20	−0.69	−0.87 to −0.33	< 0.001
Sensitivity: childbirth at health facilities vs. AKI, excluding East Kalimantan, Riau, and West Sulawesi	17	−0.83	−0.94 to −0.55	< 0.001

CI = confidence interval. After excluding the three provinces with inconsistent data, the correlation between deliveries at health facilities and MMR strengthened (rho = −0.83).

Discussion

Midwives remain the backbone of childbirth care. In two consecutive national surveys, midwives attended approximately 61–63% of births—twice the proportion attended by obstetricians. The increase in births attended by health professionals to over 96% by 2023 was largely achieved through midwives. These findings are consistent with Hatt et al. (2007), who showed that village midwife programs are the primary drivers of the expansion of professional childbirth care, particularly among the poor, as well as with Adnani et al. (2025), who identified midwives as the most accessible and trusted service providers. The framework for quality of midwifery care in *The Lancet* Series also concludes that educated and regulated midwives can provide most essential interventions for mothers and newborns (Renfrew et al., 2014).

The role of midwives has shifted from the home to health facilities. The increase in births at health facilities from 66.7% to 90% over a ten-year period occurred alongside a stable proportion of midwives. This means that midwives remain indispensable, but their workplaces have shifted to community health centers, clinics, and TPMBs. These changes were driven by policies promoting facility-based childbirth (Indonesian Ministry of Health, 2014), the expansion of health insurance coverage—which has been shown to increase facility-based births among poor women (Brooks et al., 2017)—and prenatal classes that increase the likelihood of facility-based childbirth (Azhar et al., 2020).

The place of delivery determines safety. Within the framework of the "three delays," home births attended by midwives can reduce the first delay, but the second delay remains significant because mothers experiencing hemorrhage must be transported to a health facility in critical condition (Thaddeus & Maine, 1994). Titaley et al. (2012) demonstrated that home births attended by trained personnel do not provide meaningful protection against early neonatal mortality. The results of this study reinforce that argument: the coverage of births at health facilities is strongly correlated with MMR across provinces (rho = −0.69, and −0.83 after outliers were removed). Cameron et al. (2019) also found that distance to a hospital and the availability of doctors were the largest contributors to differences in MMR between Java–Bali and other islands.

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Childbirth attended by midwives outside health facilities remains prevalent in eastern Indonesia. In Maluku, West Papua, and Central Kalimantan, a 13–15-point gap between births attended by health workers and those at health facilities indicates that many midwives still assist with home births. Efendi et al. (2020) reported that only 63.5% of rural women in Eastern Indonesia gave birth at health facilities, and Aryastami and Mubasyiroh (2021) found that a high density of traditional birth attendants reduces the likelihood of giving birth at a health facility by up to 70%. Strategies such as birth waiting homes, on-call village transportation, and midwife–traditional birth attendant partnerships—which shift the role of traditional birth attendants from assisters to companions—need to be strengthened. Until such access is available, midwives assisting with home births must be equipped with basic emergency care skills, knowledge of uterotonics, and referral communication channels.

The increasing role of medical specialists and cesarean sections. The 2023 SKI reported that 25.9% of deliveries were via cesarean section (GoodStats, n.d.), far above the 10–15% range considered medically appropriate (Betrán et al., 2016). Wenang et al. (2024) found that the availability of obstetricians at the provincial level is associated with higher cesarean section rates, even in uncomplicated cases. Strengthening midwife-led continuous care—which is associated with fewer interventions without increasing adverse effects (Sandall et al., 2016)—can help ensure that normal deliveries remain normal.

Quality of care, not just coverage. NTB recorded 97.4% of births occurring in health facilities in 2020, but its maternal mortality rate (MMR), according to the 2020 Population and Housing Census (LF SP2020), remained at 257 per 100,000 live births. A maternal mortality audit at referral hospitals in East Java found that most mothers arrived in a condition where they could still be saved, but died due to weak protocol implementation, delays in treatment, and tiered referrals (Mahmood et al., 2021). A study in Garut also showed that maternal deaths continue to occur in areas with high coverage of deliveries at health facilities (Susiarno et al., 2026). Thus, the readiness of PONED community health centers, midwives' competence in active third-stage management and hemorrhage management, and the speed of referral to PONEK hospitals are just as important as shifting deliveries to health facilities.

Data quality. Provincial routine data contain anomalies: coverage rates above 100%, a higher proportion of births at health facilities than births attended by health workers (West Sulawesi), and extreme discrepancies in East Kalimantan and Riau. Sensitivity analyses indicate that these anomalies tend to weaken, rather than create, the observed associations. Survey data are more consistent for assessing national trends, while routine data are more appropriate for examining interprovincial patterns with caution.

Limitations. First, detailed data on SKI 2023 birth attendants by type of health worker have not yet been obtained; therefore, comparisons of the proportion of midwives are limited to the 2017 SDKI and the 2018 Riskesdas. Second, the SDKI and Riskesdas have slightly different reference populations and time periods. Third, the 2020 provincial data coincided with the onset of the COVID-19 pandemic. Fourth, the correlation analysis was ecological in nature, covering only 20 provinces with available MMR data, and did not account for confounding factors. Fifth, deliveries at TPMBs were recorded

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as occurring at health facilities; therefore, deliveries attended by midwives at TPMBs and community health centers (puskesmas) could not be distinguished.

Conclusions and Recommendations

Births at health facilities in Indonesia increased from 66.7% (2013) to 90% (2023), and births attended by health workers reached 96.1%. Midwives continue to assist in about six out of ten births, so this success largely relies on midwives who now work in health facilities. The gap remains wide: 12 out of 33 provinces have less than 80% of births occurring in health facilities, particularly in Maluku, Papua, West Papua, and East Nusa Tenggara.

Recommendations:

- **For midwives:** make P4K and birth plan discussions a standard part of every antenatal visit, and maintain competence in basic obstetric emergencies, particularly the management of postpartum hemorrhage.
- **For community health centers and health departments:** expand birthing waiting homes and transportation support in hard-to-reach areas, and ensure that PONED and TPMB community health centers are prepared to manage early complications.
- **For professional organizations and midwifery education institutions:** strengthen the model of continuous care provided by midwives to ensure normal deliveries and reduce unnecessary interventions.
- **For researchers:** analyze the breakdown of birth attendants in the 2023 SKI data by province to observe changes in the proportion of midwives since 2018.

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