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A Comprehensive Overview of Postpartum Visits and Postpartum Complications Among Mothers in Indonesia

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Abstract

Background. Most maternal deaths occur during the postpartum period, making postpartum visits (PPV) a critical opportunity to detect complications. However, PPV coverage in Indonesia varies depending on the data source and region.
Objectives. To describe the coverage of the first postpartum visit (KF1) and complete postpartum visits by province; to analyze their association with antenatal care, delivery services, and the maternal mortality rate (MMR); and to compare routine reporting data with survey data.
Methods. A cross-sectional ecological study across 33 provinces using data from the 2020 Indonesia Health Profile, the 2020 Population Census (SP2020) Long Form on MMR, and national figures from the 2023 Indonesia Health Survey (SKI). Analyses employed the Mann–Whitney test and Spearman's correlation with a 95% confidence interval, accompanied by sensitivity analyses.
Results. National coverage of complete antenatal care (ANC) in the 2020 routine reports was 88.3%, with an interprovincial median of 83.3% (IQR 77.5–91.1); 12 provinces were below 80%, with the lowest rate in West Papua (30.7%). Complete postpartum care was strongly correlated with K4 (rho = 0.89) and delivery at a health facility (rho = 0.94), and was negatively correlated with maternal mortality (rho = −0.76; $p < 0.001$; $n = 20$). The 2023 SKI reported a complete postpartum care rate of only 26.8%, postpartum complications at 9.1%, and knowledge of postpartum danger signs at 47.8%. Hemorrhage (28.6%) and hypertension during pregnancy (23.9%) were the leading causes of maternal mortality in 2020.
Conclusion. Postpartum care is the weakest link in the maternal health care continuum, particularly in eastern Indonesia. Strengthening postpartum visits by midwives, counseling on danger signs, and routine data validation are necessary to reduce maternal mortality.
Keywords: postpartum visits, postpartum period, midwives, postpartum complications, maternal mortality, SKI 2023

Introduction

The postpartum period is the six-week (42-day) period following childbirth, during which the mother's body returns to its pre-pregnancy state. This period is often considered a safe recovery phase, yet the majority of maternal deaths actually occur during the postpartum period. Analysis of data from various developing countries shows that more than half of maternal deaths occur after childbirth, particularly in the first few days (Li et al., 1996). Hemorrhage, hypertensive disorders, and sepsis are the three leading direct causes of maternal mortality worldwide, with hemorrhage accounting for 27.1% of deaths, the majority of which occur postpartum (Say et al., 2014).

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A similar pattern is observed in Indonesia. In 2020, the Ministry of Health recorded 4,627 maternal deaths, with the leading causes being hemorrhage (1,330 cases), hypertension in pregnancy (1,110 cases), and infection (216 cases) (Ministry of Health of the Republic of Indonesia [Kemenkes RI], 2021a). Results from the 2020 Population Census Long Form placed the national maternal mortality rate (MMR) at 189 per 100,000 live births, with a wide range across provinces (Central Statistics Agency, 2023). These three leading causes can emerge or worsen during the postpartum period, making postpartum monitoring a critical opportunity to prevent deaths.

Postpartum maternal health care in Indonesia is regulated by Minister of Health Regulation No. 21 of 2021. Postpartum mothers must receive at least four postpartum visits (KF): KF1 between 6 hours and 2 days, KF2 on days 3 through 7, KF3 on days 8 through 28, and KF4 on days 29 through 42 after delivery (Indonesian Ministry of Health, 2021b). This regulation aligns with the World Health Organization (WHO) recommendation for at least four postpartum contacts to monitor bleeding, blood pressure, infections, mental health, breastfeeding, and contraception (World Health Organization, 2022). Midwives are the primary providers of postpartum care, both in health care facilities and through home visits (Adnani et al., 2025).

In many low- and middle-income countries, the utilization of maternal health services declines from pregnancy to the postpartum period. An analysis of Demographic and Health Surveys in 35 countries shows that 55.8% of women received at least four antenatal visits, but only 36.7% received the full package of antenatal care, skilled delivery, and postpartum care (Baten et al., 2025). In Tanzania, only 10% of mothers received the recommended package of services, and the largest dropout from care occurred after delivery (Mohan et al., 2017).

In Indonesia, mothers who are poor, have low levels of education, live in rural areas, and give birth outside of health facilities are less likely to receive postpartum care (Titaley et al., 2009). A qualitative study in West Java found that cost, transportation, distance, and the frequent absence of village midwives were the main barriers, as well as the perception that services are only needed when complications arise (Titaley et al., 2010). In Klaten, barriers to the use of postpartum care services include low maternal and family health literacy, cultural beliefs and practices, as well as the workload and capacity of village midwives to provide counseling (Probandari et al., 2017).

Data on postpartum visit coverage in Indonesia also present a varied picture depending on the source. Routine reports from the Ministry of Health in the Indonesia Health Profile recorded a full postpartum care coverage rate of 88.3% in 2020 (Indonesian Ministry of Health, 2021a). In contrast, the 2023 Indonesia Health Survey (SKI) reported that only 26.8% of mothers received complete postpartum care visits, 9.1% of mothers experienced complications during the postpartum period, and only 47.8% of mothers were aware of postpartum danger signs (Health Development Policy Agency, 2024, as cited in Rachel & Yulianti, 2025). Such a significant discrepancy must be understood so that program planning does not rely on overly optimistic figures.

This study aims to: (1) describe the coverage of KF1 and complete KF in each province in Indonesia, as well as the gap between the two; (2) analyze the relationship between complete KF and antenatal and delivery care at health facilities as a continuum of care; (3) analyze the relationship between the complete KF and maternal mortality rates across provinces; and (4) compare the achievement of the complete KF from routine

reports with survey results, and describe postpartum complications and causes of maternal death.

Methods

Study Design. This study is a descriptive-analytical quantitative study with an ecological *cross-sectional* design. The unit of analysis is the province. The study includes a comparison between routine report data and national household survey data.

Population and Sample. The study population consisted of all 34 provinces in Indonesia according to the 2020 administrative division (*total sampling*). Gorontalo did not report KF1 or complete KF coverage in 2020; therefore, the provincial analysis included 33 provinces. The analysis of the relationship with the 2020 Long Form SP2020 AKI included 20 provinces for which AKI values were available in open sources and for which KF data were available.

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

Table 1. Research Data Sources

Source	Data Year	Data Used	Data Type
Indonesian Health Profile (Indonesian Ministry of Health, 2021a)	2020	Coverage of K1, K4, deliveries at health facilities, KF1, complete KF, and vitamin A for postpartum mothers by province (Appendix 23.a); number of live births and maternal deaths by province (Appendix 20); causes of maternal mortality (Appendix 21)	Routine reports from health departments
SP2020 Long Form (Central Statistics Agency, 2023; Kompas.com, 2024a, 2024b)	2020	MMR by province	Census-based estimates
2023 Indonesia Health Survey (Health Development Policy Agency, 2024, as cited in Rachel & Yulianti, 2025)	2023	Complete KF, postpartum complications, knowledge of postpartum danger signs, *baby blues*, and delays in seeking help (national figures)	Household survey

Operational definitions.

Table 2. Operational definitions of variables

Variable	Definition	Scale
KF1	Percentage of postpartum mothers who received their first postpartum care within 6 hours to 2 days after delivery	Ratio (%)
Complete KF	Percentage of postpartum mothers who received postpartum care according to schedule through the final visit	Ratio (%)

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Variable	Definition	Scale
KF Gap	The difference between KF1 coverage and complete KF coverage, indicating mothers who discontinued care after the first visit	Ratio (percentage points)
K4 and delivery at a health facility	Percentage of pregnant women who received at least four standard antenatal visits, and percentage of deliveries at health facilities	Ratio (%)
MMR LF 2020 Census	Estimated maternal mortality per 100,000 live births from the census	Ratio
Routine MMR Report	Number of reported maternal deaths divided by the number of live births, multiplied by 100,000	Ratio

The indicator definition follows Minister of Health Regulation No. 21 of 2021 (Indonesian Ministry of Health, 2021b). In routine reports, the denominator is the projected number of women in labor or the postpartum period, whereas in the 2023 SKI, the denominator is the number of women who gave birth during the survey reference period.

Data processing and analysis. Data were processed using Python 3 (the pandas and SciPy libraries) in four stages:

1. Descriptive analysis: Coverage of KF1, complete KF, and KF gaps by province were presented using the median, interquartile range (IQR), and minimum and maximum values. Normality was tested using the Shapiro–Wilk test.
2. Group comparison: Complete KF in the seven Java–Bali provinces was compared with the other 26 provinces using the Mann–Whitney U test.
3. Correlation analysis: Spearman's rank correlation between the complete KF and K1, K4, deliveries at health facilities, the 2020 SP2020 maternal mortality rate (MMR), and the routine MMR report, since the data were not normally distributed. The 95% confidence interval (CI) was calculated using the Fisher-z transformation and the Bonett–Wright standard error ($1.06/\sqrt{(n-3)}$). The significance level was $\alpha = 0.05$.

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

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

4. Sensitivity analysis: Excluding Banten and West Sulawesi, which recorded higher complete KF values than KF1, resulting in inconsistent data.

The 2023 SKI data and causes of maternal mortality were analyzed descriptively and compared with routine report data.

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 researcher may submit a request for *an ethical exemption* to the institutional ethics committee.

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Results

National coverage of the complete KF is high, but it is uneven across provinces. In 2020, routine reports recorded a KF1 rate of 89.8% and a complete KF rate of 88.3% nationwide. The median complete KF across provinces was 83.3% (IQR 77.5–91.1), and the data were not normally distributed (Shapiro–Wilk $p < 0.001$). Twelve of the 33 provinces remained below 80%.

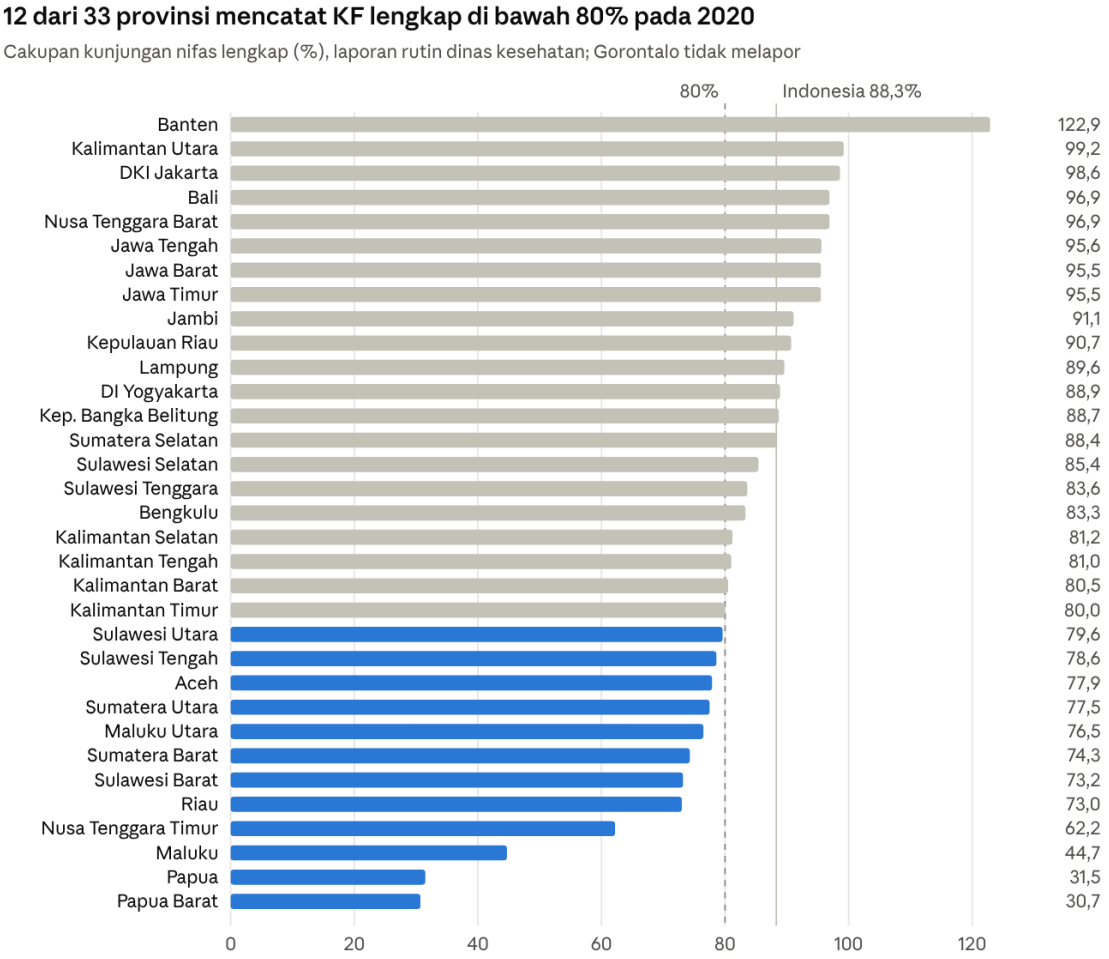


Figure 1. Twelve of 33 provinces recorded a complete immunization coverage rate below 80% in 2020. Source: Indonesia Health Profile 2020, Appendix 23.a (Indonesian Ministry of Health) · 33 provinces; values above 100% occur because the denominator uses projected targets

The Java–Bali and West Nusa Tenggara (NTB) provinces were above 95%, while West Papua (30.7%), Papua (31.5%), Maluku (44.7%), and East Nusa Tenggara (NTT) (62.2%) lagged far behind. The median rate of complete KF in Java–Bali is 95.6%, compared to 80.3% in other provinces (Mann–Whitney $U = 168.5$; $p < 0.001$). Banten recorded 122.9% because the denominator used projected targets.

Service discontinuation after the first visit was relatively low in routine reports. The gap between KF1 and complete KF nationally was only 1.5 percentage points, with an interprovincial median of 3.4 points (IQR 1.7–4.7). The largest gaps were recorded in

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Riau (8.1 percentage points), Papua (7.4 percentage points), and East Kalimantan (7.3 percentage points). Banten and West Sulawesi recorded higher complete follow-up rates than KF1 (differences of −20.7 and −22.9 percentage points), which is logically impossible and indicates a data recording issue.

The complete KF followed the pattern observed in previous service data. Provinces with high coverage of antenatal care and delivery at health facilities also recorded high complete KF scores.

Table 3. Spearman's correlation between the complete KF and antenatal care, delivery services, and MMR

Variable Pairs	n	rho	95% CI	p
Complete KF vs. K1	33	0.88	0.75 to 0.94	< 0.001
Complete KF vs. K4	33	0.89	0.79 to 0.95	< 0.001
Complete KF vs. delivery at a health facility	33	0.94	0.87 to 0.97	< 0.001
Complete KF vs. AKI LF SP2020	20	−0.76	−0.90 to −0.45	< 0.001
KF1 vs. AKI LF SP2020	20	−0.83	−0.93 to −0.60	< 0.001
Complete KF vs. AKI routine report	33	−0.39	−0.66 to −0.03	0.027
Discrepancy Between KF and AKI LF in the 2020 Population Census	20	0.13	−0.36 to 0.56	0.585
Sensitivity: Complete KF vs. AKI LF, excluding Banten and West Sulawesi	18	−0.72	−0.89 to −0.35	< 0.001

CI = confidence interval. Routine MMR is calculated as the number of reported maternal deaths divided by the number of live births.

Complete family planning (FP) coverage is strongly associated with the MMR. The higher the coverage of complete FP, the lower the MMR in the 2020 Population and Housing Census (rho = −0.76), and this association remains strong after inconsistent data are excluded (rho = −0.72). The association with the routinely reported MMR is weaker (rho = −0.39), while the FP coverage gap is not associated with the MMR.

The survey indicates that the coverage of comprehensive postpartum care is significantly lower. The 2023 SKI provides a very different picture from routine reports.

Table 4. Postpartum care and complications indicators by data source

Indicator	2020 Routine Reports	2023 SKI
KF1 (%)	89.8	
Complete KF (%)	88.3	26.8
Mothers with postpartum complications (%)		9.1
Mothers experiencing *the baby blues* (%)		1.1
Mothers are aware of postpartum warning signs (%)		47.8
Mothers delayed seeking help when danger signs appeared (%)		4.7

Source: Indonesian Ministry of Health (2021a); Health Development Policy Agency (2024, as cited in Rachel & Yulianti, 2025). Blank cells indicate that the indicator is not available in the source.

Hemorrhage and hypertension are the leading causes of maternal mortality. Of the 4,652 maternal deaths for which the cause was specified in 2020, hemorrhage accounted for 1,330 cases (28.6%), hypertension in pregnancy for 1,110 cases (23.9%), circulatory system disorders for 230 cases (4.9%), infections 216 cases (4.6%), metabolic disorders 144 cases (3.1%), heart disease 33 cases (0.7%), and COVID-19 5 cases (0.1%), while 1,584 cases (34.1%) were recorded as other causes. This figure differs slightly from the total reported maternal deaths (4,627 cases).

Discussion

Postpartum care is part of a continuum of care. The very strong correlation between complete antenatal care and the fourth antenatal visit (rho = 0.89) as well as delivery at a health facility (rho = 0.94) indicates that provinces that successfully provide antenatal care and delivery services also successfully provide postpartum care. These findings are consistent with an analysis of 35 low- and middle-income countries, which found that mothers who received at least four antenatal visits and gave birth with skilled attendants were far more likely to receive postpartum care (Baten et al., 2025). In Indonesia, childbirth attended by a health worker, a complete series of antenatal visits, and residence in the Java–Bali region are factors associated with the utilization of postpartum care, with region being the most dominant factor (Idris & Syafriyanti, 2021). Conversely, mothers who give birth outside health facilities or are assisted by untrained personnel are less likely to receive postpartum care (Titaley et al., 2009). Consequently, efforts to increase the comprehensive coverage rate cannot be separated from efforts to increase antenatal visits and deliveries at health facilities.

Regional disparities remain wide. The rate of complete family planning in Papua, West Papua, Maluku, and East Nusa Tenggara (NTT) is only 31–62%, far below the rate in Java–Bali, which is nearly 96%. A qualitative study in West Java showed that transportation costs, distance, road conditions, and village midwives who are often absent are the main barriers to postpartum care (Titaley et al., 2010). These barriers are more severe in the island and mountainous regions of eastern Indonesia. In addition to geographic factors, maternal and family health literacy, cultural beliefs, and unsafe self-care practices also hinder the utilization of postpartum care services (Probandari et al., 2017). Therefore, home visits by midwives, the utilization of community health workers and posyandu, and family support need to be strengthened in provinces with low coverage.

The complete KF is associated with maternal mortality. The strong negative correlation between the complete KF and the 2020 SP maternal mortality rate (rho = −0.76) is consistent with evidence that the majority of maternal deaths occur during the postpartum period, particularly in the first few days after delivery (Li et al., 1996). The correlation between the first contact (KF1) and the MMR is even stronger (rho = −0.83), which aligns with the critical importance of the first contact occurring within 6 hours to 2 days—when the risks of postpartum hemorrhage, postpartum preeclampsia, and infection are highest. Hemorrhage and hypertension during pregnancy accounted for more than half of maternal deaths in Indonesia in 2020 with known causes, consistent

with global patterns (Say et al., 2014). However, this association is ecological in nature and does not prove a cause-and-effect relationship. Provinces with low rates of complete KF are also those with limited access to health facilities, so delays in deciding to seek help, reaching a facility, and receiving care may all play a role simultaneously (Thaddeus & Maine, 1994).

Awareness of danger signs remains low. The 2023 SKI survey indicates that only 47.8% of mothers are aware of postpartum danger signs, and 4.7% of mothers delayed seeking help when experiencing such signs (Health Development Policy Agency, 2024, as cited in Rachel & Yulianti, 2025). This low level of knowledge increases the risk of the first delay within the "three delays" framework. Mohan et al. (2017) found that knowledge of danger signs and counseling by health workers are associated with mothers' return to receive postpartum care. Counseling on danger signs using the Maternal and Child Health (MCH) Handbook—beginning during pregnancy and before mothers are discharged from health facilities—needs to be a standard component of midwifery care.

Routine reports and surveys paint a different picture. The disparity between the rate of complete postpartum care in the 2020 routine report (88.3%) and the 2023 SKI (26.8%) is enormous and cannot be explained solely by the difference in years. Previous household surveys also recorded low rates: 32.1% in the 2013 Riskesdas and 37% in the 2018 Riskesdas (Indonesian Ministry of Health, 2019), whereas the 2023 SKI defines complete postpartum care as a minimum of four visits (KF1 through KF4) within 42 days after delivery (Health Development Policy Agency, n.d.). Possible explanations include differences in definitions, as the 2020 data likely still followed the standard of three postpartum visits outlined in Ministry of Health Regulation No. 97 of 2014 (Indonesian Ministry of Health, 2014), whereas since 2021, complete postpartum care has required four visits (Indonesian Ministry of Health, 2021b). Other explanations include the use of target projections in routine reports, which can result in coverage rates exceeding 100%; a tendency toward over-reporting in routine information systems; and differences in measurement methods between health facility records and survey respondents' recollections. An assessment of the quality of the health information system in Ethiopia also found that routine data tended to report higher coverage rates for antenatal care, deliveries attended by skilled personnel, and postpartum care than household surveys (Ouedraogo et al., 2019). The internal inconsistencies found in this study—namely, higher complete KF rates than KF1 rates in Banten and West Sulawesi—reinforce the need for validation of routine data.

The role of midwives in postpartum care. Midwives are the most common providers of postpartum care in Indonesia (Adnani et al., 2025). WHO guidelines recommend that every postpartum visit include an assessment of bleeding, blood pressure, signs of infection, mental health, breastfeeding support, and contraceptive counseling (World Health Organization, 2022). The low rate of *"baby blues"* recorded in the 2023 SKI (1.1%) should be interpreted with caution, as mental health disorders often go unrecognized without structured screening. The heavy workload of village midwives and their limited counseling capacity (Probandari et al., 2017) indicate that strengthening postpartum care requires systemic support, such as home visit schedules, mobile phone reminders, and periodic supervision.

Limitations. First, the 2020 provincial data coincided with the onset of the COVID-19 pandemic, which may have affected service delivery and record-keeping. Second, the 2023 SKI data were obtained from secondary sources because the full reports were inaccessible, and province-specific details as well as the types of postpartum disorders are not yet available. Third, routine reports and the SKI differ in year, definitions, and measurement methods, so comparisons between the two are descriptive in nature. Fourth, the correlation analysis is ecological in nature, covering only 20 provinces for the 2020 SP maternal mortality rate (AKI LF), and does not account for confounding factors such as poverty and geographic accessibility. Fifth, one-third of maternal deaths were recorded under "other causes," so the proportion of causes related to the postpartum period is likely higher than recorded.

Conclusions and Recommendations

The 2020 routine report recorded a national complete KF coverage rate of 88.3%, but 12 of 33 provinces remained below 80%, with the lowest coverage rates in West Papua, Papua, Maluku, and East Nusa Tenggara. Complete family planning is strongly correlated with the K4 indicator and deliveries at health facilities, and is strongly negatively correlated with maternal mortality rates across provinces. The 2023 SKI survey indicates a significantly lower rate of complete family planning coverage (26.8%); 9.1% of mothers experienced postpartum complications; and only 47.8% of mothers were aware of the warning signs of postpartum complications. Postpartum care is the weakest link in the continuum of maternal health services and needs to be strengthened alongside antenatal and delivery care.

Recommendations:

- **For midwives:** ensure that Postpartum Visit 1 (KF1) is conducted before the mother is discharged from the health facility; schedule Postpartum Visits 2 through 4 (KF2–KF4) starting during pregnancy; and provide counseling on postpartum warning signs—including signs of mental health issues—to mothers and their families using the Maternal and Child Health Handbook (Buku KIA).
- **For community health centers and health departments:** strengthen home visits and postpartum visit reminders in areas with low coverage, particularly in Eastern Indonesia, and conduct periodic validation of KF data to prevent coverage rates above 100% and inconsistencies between KF1 and the complete KF set.
- **For the Ministry of Health:** align the definition of a complete postpartum follow-up between routine reports and surveys, and publicly release data by province so that progress can be consistently monitored.
- **For researchers:** analyze individual data from the 2023 SKI to assess determinants of complete postpartum care and types of postpartum complications by province.

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