Determinants of Unregistered Births Among Children Under Five in Indonesia

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Abstract

Birth registration is a critical aspect of a child's identity and an essential human right, facilitating access to education and health services. There is a need for evidence regarding the availability of information about children with unregistered birth status. This study aims to identify factors affecting unregistered births. It employed a cross-sectional study design using the 2017 Indonesia Demographic and Health Survey data involving 16,555 children born to women of childbearing age. The dependent variable was birth registration status, whereas the independent variables covered characteristics of children, parents, and health services. Determinants of unregistered births were analyzed using logistic regression. The results of this study indicated that 81% of children under five have a birth registration document, 64% have a birth certificate, and 17% have a birth notification letter. Still, the rest are without it due to various reasons, including the high costs involved in arranging for a birth registration document, parents' lack of awareness, and distance issues. The results further revealed the determinants of unregistered births, including low maternal education, extreme poverty, a lack of official marital status, residency in the eastern region of Indonesia, and childbirths outside health facilities without the assistance of health professionals. These findings highlight the need for strengthened collaboration among health facilities, the civil organization system, and public education services to raise awareness about the importance of birth registration.

Keywords

Children under five; civil status; Indonesia; unregistered births

Introduction

Birth registration is a critical aspect of a child's identity and an essential human right; it is pivotal in ensuring access to basic services such as education, health services, protection, and legal recognition (Phillips et al., 2015; United Nations Children's Fund [UNICEF], 2013). The United Nations Convention on the Rights of the Child, ratified by Indonesia, asserts that every child has the right to be recognized in their identity from birth (UNICEF, 2013). This right is enshrined in Article 7 of the Convention, emphasizing the necessity of swift and free birth registration, ensuring the child's entitlement to know and be recognized by the law (UNICEF, 2013).

Governments and organizations, such as the United Nations Children's Fund (UNICEF), prioritize increasing birth registration rates among children under five. Improved birth registration is a crucial indicator of achieving Sustainable Development Goal (SDG) 16.9, which aims for universal legal identity recognition by 2030 (United Nations, 2023). Despite global efforts to promote universal birth registration, many countries, including Indonesia, still have high rates of unregistered births among children under five (Mills et al., 2017).

Civil registration and vital statistics (CRVS), particularly on birth registration, are vital for fulfilling children's rights and supporting social and community well-being (Jackson et al., 2018). In Indonesia, civil status includes marital status, birth, and death, significantly impacting legal recognition and access to various rights. Birth registration is a vital component of the civil status system. In Indonesia, the aim is to ensure that every born child is officially recognized and granted the fundamental rights established by law. However, many children in Indonesia still lack a birth certificate and only possess a birth notification letter issued by a healthcare facility (Jackson et al., 2014; Sumner, 2015). While this letter provides official notification of childbirth, it does not afford the same legal recognition as a birth certificate (Jackson et al., 2014). This notification is recorded as live birth data and utilized for health statistical purposes, and it is required by the Civil Registry Office to issue a birth certificate.

Primarily, birth registration ensures a child's right to recognition as a legitimate citizen. An official identity document, such as a birth certificate, will be helpful for administrative, educational, and healthcare purposes (Pont et al., 2023), providing a clear identity and protecting the child's rights as a citizen (Candia, 2019). In addition to fulfilling children's rights, birth registration holds significant benefits in statistics and development planning. The recording of births assists in calculating child mortality rates, a crucial indicator of community health (Mills et al., 2017). These data serve as a foundation for identifying demographic groups that require special attention to enhance child health (Mills et al., 2017).

Some factors, including mothers' education, household wealth, and residence, influence which children under five are registered or unregistered (Amo-Adjei & Annim, 2015). Birth and infant and child mortality data are the most reliable demographic measures for monitoring population health. However, without a proper birth registration system, crucial estimates for child health indicators depend on surveys typically conducted only at the national level. District governments in Indonesia demand data on childhood mortality rate and maternal mortality ratio, but they continue to face challenges due to the lack of reliable data sources.

In Indonesia, birth certificate registration is regulated through laws, presidential decrees, and directives issued by the Ministry of Home Affairs. The Indonesian government has initiated efforts to accelerate the increase in birth certificate ownership. One of the government's efforts is to integrate birth registration services with healthcare facilities such as hospitals, clinics, midwifery practice settings, and community health centers to enable immediate registration after birth (Kertati, 2017). Despite this effort, Indonesia is still categorized as a country with limited civil registration for birth statistics (Adair et al., 2023) due to geographic barriers, low public awareness, and administrative obstacles. Furthermore, the limitations of the civil registration system in the context of decentralization are particularly concerning, especially in estimating child and maternal mortality at the district level (Afifah et al., 2022).

Birth and death data are essential for childbirth services, making health facilities crucial for efforts to improve birth registration (United Nations, 2014). Unregistered births constrain the registration system's use as a data source for child health indicators at the state and district levels. Given the importance of birth registration, this study aimed to identify factors affecting unregistered births among children under five. The results are invaluable for the Indonesian government's evaluation of constraints related to birth registration.

Methods

Study design and population

This study employed a cross-sectional design and utilized data from the 2017 Indonesian Demographic and Health Survey (IDHS). It was conducted by Statistics Indonesia (BPS) in collaboration with the National Population and Family Planning Board (BKKBN) and the Ministry of Health of the Republic of Indonesia, with technical support from Inner City Fund-United States of America (ICF-USA). Data collection was carried out from July to September 2017 across 34 provinces of Indonesia.

The sampling design of the 2017 IDHS covered 1,970 census blocks in urban and rural areas, targeting 49,250 households and 59,100 women of reproductive age as the focus. Additionally, adolescent and married males were selected from households with women of reproductive age. The household selection was carried out in two stages. The first stage involved the probabilistic selection of census blocks proportional to their size (PPS) based on the household listing from the 2010 Population Census. In this stage, area (urban and rural) stratification was performed in the sample framework according to the sequence of the wealth index from the 2010 Population Census.

In the subsequent stage, 25 households were involved based on the updated results of each selected census block, of which eight were chosen for the married male sample. The respondents were women of reproductive age residing in the selected households. Each woman of reproductive age who had given birth was inquired about the history of all their live-born children, including details regarding the possession of a birth document.

Our study analyzed surviving children under five years of age at the time of the survey based on the data subset of children under five obtained from the DHS program website. Within a household, more than one child under five might be included in our analysis. The total number of children under five included was 17,019, with 464 children reported as deceased

and 16,555 still alive. We specifically utilized data on children who were still alive and had *de jure* status when interviewed (National Population and Family Planning Board [BKKBN]et al., 2018).

Variables

The dependent variable in this analysis was the birth registration status of children under five, categorized as registered or unregistered. We addressed the variable related to registration and documentation through questions in the individual women of childbearing age questionnaire, specifically in Section 4 (Variable s407ab). In our context, birth registration refers to children under five having a birth certificate or any other birth document allowing the children to be categorized as registered. Respondents whose children under five had no birth document or those who responded "do not know" were categorized as having children with unregistered births. We collected detailed information on the age at which a child's birth was registered for those in the registered group. For the unregistered group, we identified the reasons for the mothers not registering their children. According to six responses to the IDHS questionnaire, the reasons for unregistered births included high costs, distant registration location, a lack of awareness about the registration requirements, passing the time limit for registration or aversion to fines, uncertainty about where to register, and other unspecified reasons (BKKBN et al., 2018).

We incorporated several explanatory variables related to the characteristics of children, parents, and health services during childbirth (birth attendants and places of delivery). Child characteristics included gender and age. Parental characteristics included the mother's marital status, mother's education, husband/partners of respondent education, residence, region, and the household wealth index. Marital status was grouped into "married/widowed/divorced" and "never in union/living together/separated." Education for both mother and husband or partner was categorized into four groups: "no education," "primary education," "secondary education," and "higher education." The wealth index was a proxy for the household's economic status derived from household asset variables collected during the survey, categorized into five groups: "poorest," "poorer," "middle," "richer," and "richest." The residency was divided into "urban" and "rural." The region variable grouped provinces based on their island location into five categories: "Sumatra," "Java-Bali," "Kalimantan," "Sulawesi," and "Eastern Indonesia," which covered provinces in Nusa Tenggara, Maluku, and Papua. Characteristics of health services related to the childbirth process included birth attendants and places of delivery. Birth attendants comprised health professionals (obstetricians, general practitioners, midwives, and nurses) and non-health professionals (traditional birth attendants, relatives, no one). The places of delivery included health facilities (hospital/clinic, midwife practice setting, other sectors) and non-health facilities (home).

Statistical analysis

Descriptive analysis was used to examine the proportion of each research variable and explain why parents did not register their children's births based on responses to the questions in the IDHS 2017 questionnaire. This study employed a dual analytical approach to investigate the reasons behind the lack of birth registration. Initially, a bivariate analysis was conducted to identify specific factors contributing to non-compliance with birth registration practices. This analysis examined the relationship between each predictor variable and the outcome (non-compliance with birth registration). The association was quantified using the Crude Odds

Ratio (COR), with a significant p value ≤ .05. Subsequently, a multivariate analysis using binary logistic regression was employed to examine the determinants of unregistered births. The multivariate analysis controlled for the influence of multiple factors simultaneously to identify which factors remained significantly associated with unregistered births after adjusting for other variables. The results of the multivariate analysis are reported as Adjusted Odds Ratios (AOR), with a $p \leq .05$ and 95% confidence intervals (CI). The data analysis process covered importing data, selecting variables, recoding variables according to their operational definitions, excluding missing values, and analyzing the data by running logistic regression using Stata 15.

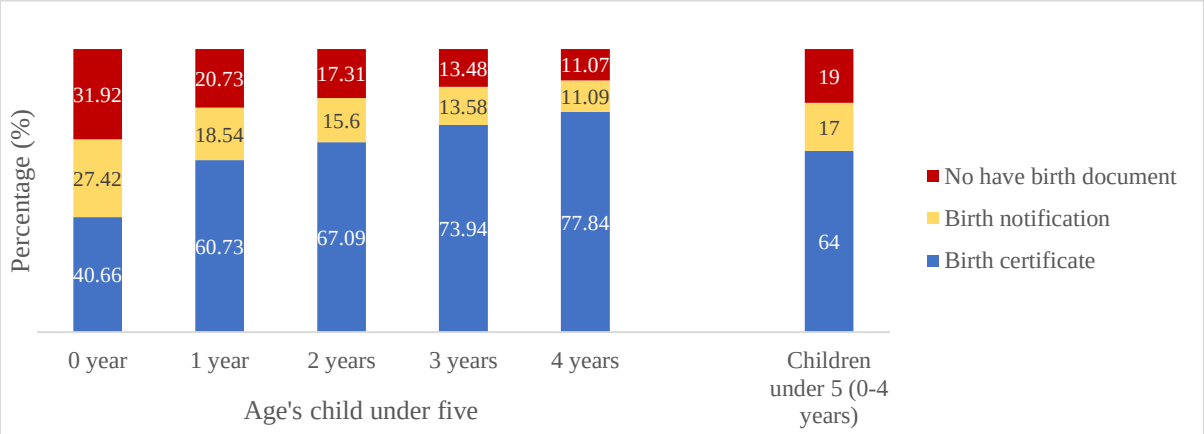
Ethical statement

The 2017 Indonesia Demographic and Health Survey (IDHS) received ethical clearance from the Institutional Review Board of Inner-City Fund (ICF) International and ORC Macro (ICF IRB192 FWA00000845). During the data collection, interviewers comprehensively explained the survey and secured respondents' consent before participating. The researchers then requested permission from the DHS Program to download and use the 2017 IDHS dataset.

Results

An overview of children under five in Indonesia by age and status of birth registration, based on the type of birth document available, is presented in Figure 1. The survey found a gradual increase in birth certificate ownership as children grew older. Among newborns, only 40.66% had a birth certificate. By age 1, the percentage of birth certificate ownership increased to 60.73%, and by age 2, it increased further to 67.09%. This coverage continued through ages 3 and 4. These findings showed delays in birth registration. While many children in Indonesia were eventually registered, a significant number were unregistered during their early years.

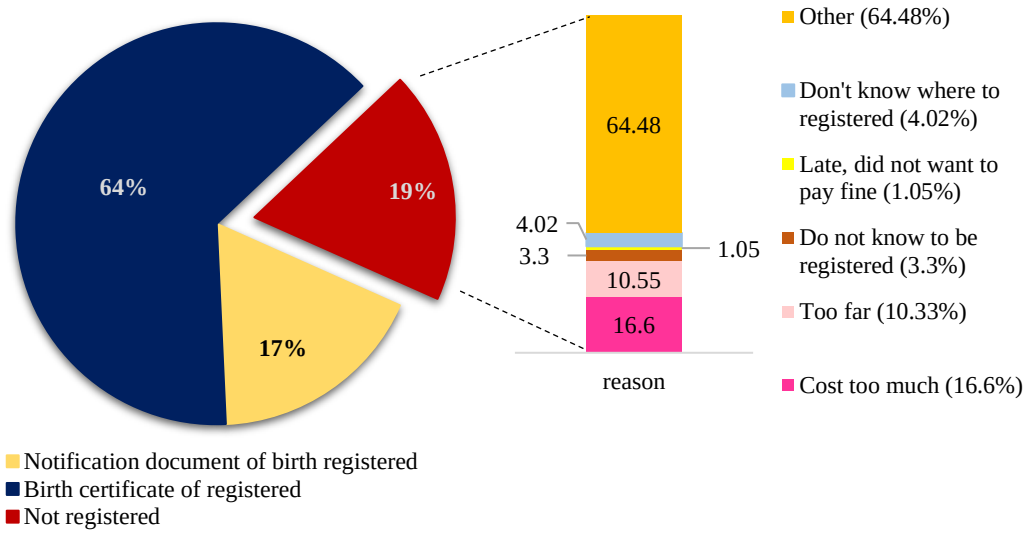
Figure 1: Birth Registration Status by Age Among Children Under Five in Indonesia, 2017



The study further explored why children under five in the unregistered group did not have a birth document (Figure 2). It was found that 81% of all children under five were recorded in the birth register, while 17% did not have a birth certificate. A significant 19% of children did not have either a birth certificate or a birth notification letter. A lack of awareness about the

registration process was a significant barrier. Other reasons included high administrative costs, distance to the birth registration offices, and reluctance to pay fines for late registration (Figure 2). Furthermore, 3.3% of respondents were unsure about the necessity of a birth certificate, underscoring the critical need for improved education on this issue.

Figure 2: Overview of Birth Registration Status and Reasons for Unregistered Births in Indonesia, 2017



Logistic regression results in Table 1 showed that gender was not significantly correlated with unregistered birth, unlike the other ten independent variables tested. This indicates that gender did not determine whether a birth was registered. Meanwhile, as age increased, the number of registered children under five tended to increase, with 67.98% of children under five registered at age one and 88.75% registered at age four. This factor was statistically significant, with the odds ratio (OR) indicating that the chances of a child being registered increased as age increased. The unregistered births of children under five were primarily associated with parents never living together or separated, parents not receiving a formal education, children belonging to families with the lowest level of welfare, children being born with no assistance from health professionals, and being born outside health facilities, and the children living in rural areas, especially in the eastern region of Indonesia. For a more detailed examination, a multivariate analysis was conducted to consider the variables collectively.

Table 1: Distribution of Children Under Five by Type of Birth Document and Crude Odds Ratios for Unregistered Status, Indonesia 2017

Characteristic	Registered		Unregistered		Total	*p* value	Crude OR
	n	%	n	%			
Sex of children							
Male	6,802	80.84	1,612	19.16	8,414		Ref
Female	6,601	81.27	1,521	18.73	8,123		0.939 (0.860, 1.024)
Age							
0	2,180	67.98	1,026	32.02	3,207		Ref
1	2,688	79.10	710	20.90	3,399	***	0.561 (0.492, 0.639)
2	2,692	82.52	570	17.48	3,363	***	0.449 (0.394, 0.512)
3	2,860	86.45	448	13.55	3,308	***	0.332 (0.288, 0.383)
4	2,981	88.75	377	11.25	3,359	***	0.269 (0.231, 0.312)

Characteristic	Registered		Unregistered		Total	*p* value	Crude OR
	n	%	n	%			
Current married status							
Married/widowed/ divorced	13,320	81.49	3,026	18.51	16,347		Ref
Never in union/living together/separated	82	43.57	107	56.43	190	***	5.700 (4.268, 7.614)
Mother's education							
Higher	2,327	91.04	228	8.96	2,556	***	Ref
Secondary	7,973	83.48	1,578	16.52	9,553	***	2.012 (1.686, 2.401)
Primary	3,029	71.32	1,218	28.68	4,247	***	4.088 (3.401, 4.914)
No education	71	39.77	108	60.23	179	***	15.400 (10.253, 23.130)
Husband/partners of respondent education							
Higher	2,020	91.49	187	8.51	2,208		Ref
Secondary	7,721	83.51	1,524	16.49	9,245	***	2.010 (1.660, 2.433)
Primary	3,203	72.68	1,204	27.32	4,407	***	3.725 (3.058, 4.538)
No education	96	51.73	90	48.27	187	***	10.598 (7.425, 15.127)
Wealth index							
Richest	2,928	93.03	219	6.97	3,148		Ref
Richer	2,947	88.51	392	11.49	3,330	***	1.755 (1.403, 2.196)
Middle	2,898	86.53	451	13.47	3,349	***	2.004 (1.610, 2.496)
Poorer	2,652	79.57	680	20.43	3,333	***	3.298 (2.677, 4.062)
Poorest	1,976	58.54	1,399	41.46	3,376	***	9.130 (7.508, 11.101)
Residence							
Urban	7,045	87.76	982	12.24	8,027		Ref
Rural	6,358	74.72	2,151	25.28	8,507	***	2.425 (2.185, 2.691)
Region							
Sumatra	3,111	80.75	741	19.25	3,952		Ref
Java-Bali	7,850	85.84	1,294	14.16	9,145	***	0.692 (0.609, 0.786)
Kalimantan	836	81.04	195	18.96	1,032		0.981 (0.814, 1.182)
Sulawesi	851	72.14	329	27.86	1,191	***	1.620 (1.403, 1.870)
Eastern Indonesia	753	56.82	572	43.18	1,326	***	3.189 (2.799, 3.633)
Birth attendants							
Health professional	12,731	84.14	2,400	15.86	15,132		Ref
Non-health Professional	667	47.71	730	52.29	1,398	***	5.812 (5.007, 6.746)
Place of delivery							
Health facility	11,337	86.11	1,828	13.89	13,165		Ref
Non-health facility	2,062	61.27	1,303	38.73	3,366	***	3.920 (3.524, 4.359)

Note: n = number of observations (weighted)

Table 2: Logistic Regression Analysis: Determinant of Unregistered Births among Children Under Five in Indonesia

Unregistered	AOR	95% CI	*p* value
Age			
0	Ref		
1	0.471	0.405, 0.549	.001*
2	0.315	0.269, 0.368	.001*
3	0.242	0.204, 0.288	.001*
4	0.173	0.146, 0.206	.001*
Mother's education			
Higher	Ref		
Secondary	1.421	1.131, 1.785	.003*
Primary	1.817	1.404, 2.352	.001*

Unregistered	AOR	95% CI	*p* value
No education	3.728	2.182, 6.368	.001*
Husband/ partners of respondent education			
Higher	Ref		
Secondary	1.358	1.054, 1.749	.018*
Primary	1.438	1.086, 1.904	.011*
No education	1.839	1.173, 2.883	.008*
Current married status			
Married/widowed/divorced	Ref		
Never in union/living together/ separated	2.087	1.384, 3.147	.001*
Residence			
Urban	Ref		
Rural	1.123	0.984, 1.282	.083
Wealth index			
Richest	Ref		
Richer	1.316	1.013, 1.709	.040*
Middle	1.355	1.043, 1.759	.023*
Poorer	1.825	1.407, 2.367	.001*
Poorest	3.472	2.655, 4.541	.001*
Region			
Sumatera	Ref		
Java-Bali	0.935	0.804, 1.088	.388
Kalimantan	0.911	0.744, 1.116	.371
Sulawesi	1.432	1.215, 1.687	.001*
Eastern Indonesia	2.067	1.767, 2.417	.001*
Birth attendants			
Health professional	Ref		
Non-health professional	1.955	1.595, 2.397	.001*
Place of delivery			
Health facility	Ref		
Non-health facility	1.983	1.702, 2.311	.001*

*Note: *Significance level, p value < .05*

Table 2 presents the adjusted odds ratios obtained from the analysis of delivery services after adjusting for various characteristics. It shows that the likelihood of unregistered births among children aged four years was lower than that of younger children. These results are consistent with the analysis results in Table 1, indicating that the proportion of registered children under five also tended to increase as age increased. Children under five born to uneducated mothers were 3.7 times more likely to be unregistered compared to children born to mothers with higher education (AOR = 3.728, 95% CI [2.182, 6.368], $p < .000$). This stark difference in birth registration rates based on maternal education underscores the urgent need to address this issue.

The poorest families had a 3.4 times higher likelihood of having children with unregistered births (AOR = 3.472, 95% CI [2.655, 4.541], $p < .000$), mothers without official marital status (never in union/living together/separated) were twice as likely to have children with unregistered births as mothers with official marital status (AOR = 2.087, 95% CI [1.384, 3.147], $p < .000$). Families living in the eastern region of Indonesia had twice the tendency to have children with unregistered births of that of those living in other areas (AOR = 2.067, 95% CI [1.767, 2.417], $p < .000$). Delivery services provided by non-healthcare providers and outside health facilities were nearly two times (1.9) as likely to result in unregistered births as those

provided by healthcare providers and within health facilities. Healthcare providers were authorized to issue a birth notification required to obtain an official birth certificate.

Discussion

This study investigated the determinants of unregistered births for children under five and their mothers' influence on their birth registration status. The results showed that in 2017, the coverage of birth registration for children under five in Indonesia was 81%; the other 19% did not have a birth certificate or any other birth registration document. This condition was similar to that in India in 2020, where 80% of children under five were registered, but 16% did not have a birth certificate. In India, 20% of children under five were found to require being registered, a complex issue affecting 2.7 million children (Kumar & Saikia, 2021). Nigeria faced a contrasting condition, with only 17.1% and 95% CI [16.3, 7.9] of children under five possessing a birth certificate, leaving 83% at risk of not being recognized by the country's legal system (Anaduaka, 2022).

Figure 1 shows that 64% of children had a birth certificate. The SDGs highlight the commitment to "leave no one behind" (United Nations Sustainable Development Group [UNSDG], 2022), so improvement is needed. Of those without a birth certificate, 17% had a birth notification letter, which can be converted into a birth certificate.

Some parents of children under five have not registered their children's births or obtained birth certificates for their children for various reasons. Of these parents, 10% identified distance as a significant obstacle to birth registration. Despite extensive infrastructure development, multiple regions in Indonesia, particularly underdeveloped and border regions scattered throughout its 17,744 islands, still face challenges. High transportation and opportunity costs can prevent or delay poor households from registering their children's births (Amo-Adjei & Annim, 2015; Oung et al., 2019). Innovative approaches are needed to simplify the birth registration process, reduce these costs, and encourage parents to register their children's births within the required time frame. Evidence from 43 countries suggested that partnerships between birth registration services and health institutions, such as enabling government vaccination identity cards for birth registrations, could significantly increase the likelihood of children being registered (UNICEF, 2005). Several regency/city governments, such as those of Surakarta, Makassar, and Padang Pariaman, have initiated collaborative efforts between healthcare facilities and the Civil Registration Office for the issuance of birth certificates (Musabry & Haerana, 2021; Rahmawati & Suryawati, 2021). If these initiatives prove successful, the challenge will be to expand their implementation to the remaining 510 regencies and cities nationwide.

Administrative costs and fines for late reporting also set barriers to birth registration. According to Law Number 23 of 2016, births must be reported within 60 days. At the same time, birth certificates are free, and late reporting results in fines. Decentralization allows local governments to impose fees on those seeking a birth certificate (Kertati, 2017). Even more burdensome for parents is the transportation cost to obtain a birth certificate from the local Civil Registry Office (Kertati, 2017). Cultural beliefs about naming a child, which hold against naming a child before 40 days, also hinder timely registration. Additionally, women with unwanted pregnancies often encounter difficulties in obtaining the necessary documents required for submitting a birth certificate (Kertati, 2017). Addressing these challenges requires

intensive education to ensure that parents, especially mothers, fulfill their obligation to register all children, including abandoned ones.

Survey results revealed that 3.3% of respondents were unsure about the importance of registering children's births and obtaining a birth certificate for the children, highlighting the need for better education, especially in rural, low-welfare areas. A birth certificate constitutes the state's first official recognition of a child's existence and a requirement for accessing other rights (Amo-Adjei & Annim, 2015). Therefore, it is essential to emphasize that a birth certificate confers a citizen's identity to an individual, which is necessary for accessing government programs. However, many individuals with low education levels perceive that obtaining a birth certificate is a burden due to the transportation or opportunity costs involved. Birth, death, and vital statistics are crucial demographic tools for monitoring population and health (Mahapatra et al., 2007). Without a birth certificate, individuals miss government programs, such as formal education assistance for children up to grade nine, National Health Insurance coverage, social assistance for disadvantaged families, and legal support.

This study's results showed that children under five with unregistered births are associated with parents' low levels of formal education, marital status, low-income family status, residence in the eastern region of Indonesia, especially Sulawesi, and births attended by non-health professionals outside health facilities. These findings align with previous studies in Uganda and Ghana (Amo-Adjei & Annim, 2015; Candia, 2019).

While the bivariate analysis highlighted that child gender had no significant association with birth registration status, the multivariate analysis revealed that children under the age of one were more likely to be without a birth certificate compared to those over the age of four. A study in Ghana showed that birth registration and certification are often done beyond the first year of birth, which should be a concern for the government. Similar findings have been reported in Nigeria (Makinde et al., 2016). Possible reasons for the delay in birth registration include the requirement that a child must have a birth certificate for school enrollment or to access social assistance as they grow older (Amo-Adjei & Annim, 2015).

In addition, mothers without education were found to have a greater likelihood of not registering their children's births (AOR 3.728). This finding is consistent with previous studies, which found that mothers with higher levels of education were significantly less likely to have children without a birth certificate (Candia, 2019; Dake & Fuseini, 2018; Isara & Atimati, 2015). This link between the mother's education and birth registration can be attributed to several factors. Firstly, mothers with higher levels of education typically possess greater awareness of the importance of birth registration and its associated benefits for their children, such as improved access to health and education services. Secondly, mothers with higher levels of education often have enhanced access to the information and resources required to complete birth registration processes accurately (Isara & Atimati, 2015).

This study also found that children from the poorest group were more likely to be unregistered at birth, consistent with a previous study covering 74 countries and most UNICEF regions (Bhatia et al., 2017). Targeted assistance is provided to people experiencing poverty, but poorer households potentially face restrictions to access social services, healthcare, and government programs.

Marital status also affected birth registration. Mothers who were never married, living together with their partners, or separated were twice as likely to fail to register their children's

births as married mothers. This failure was associated with administrative barriers, lack of awareness, limited access to the civil registry office, or a lower level of education. This result aligns with a 2018 Ethiopia-based mixed-method study, which found that mothers with informal relationships were less likely to register their children. Ethiopian women who give birth outside of a marriage do not want to register their babies' births and officially publicize the babies' fathers, as premarital births are traditionally considered taboo, especially in the Tigray district.

Additionally, unmarried mothers or those in informal relationships may face administrative challenges or social barriers that make them less likely to register their children's births. Legally married mothers are more likely to receive more information about the importance of birth registration and the associated legal obligations (Abay & Gebre-Egziabher, 2020). To increase the coverage of birth certificate ownership and address challenges such as a lack of a marriage certificate or a birth certificate, the Indonesian government has introduced a policy involving the Statement of Absolute Responsibility. This statement, made by the applicant or guardian, is a sworn truth, validated by two witnesses (Ministry of Home Affairs of Indonesia, 2016).

Residence by region had a significant impact on birth registration and certificate ownership. Children living in the eastern region were twice as likely (AOR 2.067) to be unregistered as those living in the Sumatra region (western region), which is concerning. This finding is similar to the finding of a previous study, which highlights the urgent need to address the higher incidence of unregistered births in the eastern region, especially in East and West Nusa Tenggara Provinces (Jackson et al., 2014). Nonetheless, mothers' use of perinatal health services, such as delivery services in a clinic or a hospital and postnatal care, enhances the probability of birth registration (Jackson et al., 2014).

This study also found that births attended by non-health workers outside health facilities were highly likely unregistered. Births attended by non-healthcare providers outside health facilities were nearly twice as likely to be not registered and documented as those attended by healthcare providers in health facilities. This finding is similar to a previous study in Ghana, which observed that births at home and births not assisted by medical professionals were the least likely to be registered and certified (Dake & Fuseini, 2018). According to a 2012 regulation of the Indonesian Minister of Women's Empowerment and Child Protection, the Ministry of Health shall facilitate the process of obtaining birth certificates for children born in hospitals, clinics, community health centers, midwife's practice settings, and other government and community health service facilities through the issuance of a birth registration letter. This letter is required to be issued as a birth certificate by the Population and Civil Registration Office.

However, a study in West and East Nusa Tenggara in 2013 showed that not all women who gave birth in healthcare facilities, including formal ones, registered their births. Of the 259 children (57% of the sample) born in clinics, only 36% were officially registered. Another finding was that 30% of the women observed gave birth in their own homes, and 43% relied on traditional midwives during delivery. These groups are more likely to need access to birth notification letters. Integrating services into community clinic settings, with community health workers and midwives already serving the community, can help overcome existing barriers and increase enrollment rates among some of Indonesia's most vulnerable populations (Jackson et al., 2014). Efforts to integrate community healthcare facilities and community health workers or midwives must be continuously monitored and improved to increase birth certificate coverage among disadvantaged groups.

The Indonesian government has targeted birth certificate issuance for children aged 0–18 through an accelerated program, with 88.6% coverage currently achieved. Tables 1 and 2 show that the birth registration rate increased with age. However, according to Table 1, 32% of infants were unregistered, suggesting the need to pay more attention to the birth registration system in Indonesia and carry out development at the district level. Continuous and permanent birth registration facilitates the collection of accurate birth data for various health programs. In the health sector, the registration system mainly provides birth data for calculating the Infant Mortality Rate (IMR) and Maternal Mortality Ratio (MMR), which constitute indicators of the maternal and child health status at the district level.

Ideally, every vital population event, particularly live births, should be universally registered, with a goal of 100% coverage (United Nations, 2014). In Indonesia, universal birth certificate coverage can be achieved through collaboration between healthcare facilities and the Civil Registration Office in the birth certificate issuance process.

A birth certificate provides legal recognition to every child, granting them the right to various services available to every resident in Indonesia (Falahiyati & Ahmad, 2021). Despite the challenges mentioned above, the World Health Organization states that birth data from the registration system are valid for calculating IMR and MMR if a 90% data completeness level is achieved (United Nations Economic and Social Commission for Asia and the Pacific [UNESCAP], 2021). The Ministry of Health mandates that childbirth should occur in healthcare facilities (Ministry of Health of the Republic of Indonesia, 2020). If all Indonesian healthcare facilities collaborate with the Department of Population and Civil Registration in recording and issuing birth certificates, the quality of the birth registration system in Indonesia is believed to increase, and efforts to strengthen CRVS to meet the need for the availability of indicators for maternal and child health status at the district level can be achieved.

Limitations

This study has several limitations. It primarily relied on responses to the 2017 IDHS questionnaire, which provides predefined options for reasons of non-registration and lacks qualitative data that could offer a deeper understanding of individual circumstances. In addition, it did not explore socioeconomic, cultural, or geographic factors in depth. Consequently, it did not capture nuanced, in-depth insights into the specific factors that may contribute to the failure to register births.

Conclusion

This study concludes that there are children under five whose births are unregistered for reasons related to cost, community unawareness, and distance issues. Factors associated with unregistered births include low maternal education, extreme poverty, a lack of official marital status, residence in the eastern region, and childbirth in non-health facilities and assisted by non-health professionals. The registration of every live birth provides data for Civil Registration and Vital Statistics (CRVS) to calculate ideal Infant Mortality Rate (IMR) and Maternal Mortality Ratio (MMR) indicators at the district level, which is helpful for the health sector. Therefore, there is a need for enhanced collaboration between healthcare facilities and the Civil Registration Office and educational efforts through media campaigns to raise

awareness about the importance of birth certificates. These campaigns should address the issues related to birth registration and provide solutions to fulfill the requirements for birth registration.

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