ORIGINAL RESEARCH

The influence of maternal factors and residential building characteristics on infant mortality in Papua Province, Indonesia, based on secondary data analysis of the IDHS 2017

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ABSTRACT

Objective: Infant mortality remains a critical global public health concern, with 2.4 million neonates dying within the first month of life in 2020. In Indonesia, the infant mortality rate stood at 16.85 per 1,000 live births in 2022, with Papua Province reporting the highest incidence. This study seeks to examine the determinants of infant mortality in Indonesia, with a focus on maternal age, antenatal care, immunization status, delivery conditions, parity, educational attainment, maternal employment, household income, and housing characteristics.

Materials and Methods: This study utilized a quantitative cross-sectional design, analyzing secondary data from the Indonesian Demographic and Health Survey (IDHS) 2017. The sample comprised 658 women aged 15–49 years who delivered infants aged 0–11 months between 2012 and 2017 in Papua Province. The analytical approach consisted of three phases: univariate analysis to assess frequency distributions, bivariate analysis employing logistic regression ($p < 0.05$) to examine associations, and multivariate analysis using multiple logistic regression for simultaneous variable assessment. Variables with p-values < 0.25 were retained, while those exceeding 0.05 were sequentially eliminated, with emphasis on Odds Ratio (OR) variations.

Results: The analysis identified maternal education level as the most significant predictor of infant mortality, demonstrating an Adjusted Odds Ratio (AOR) of 43.579 (p-value = 0.000, 95% CI = 5.549–342.235). Mothers with only basic education were 43.57 times more likely to experience infant mortality compared to those with advanced education.

Conclusions: Maternal socioeconomic factors exert a substantial influence on infant mortality in Papua Province, and these findings can guide targeted interventions to mitigate mortality rates in the region.

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Highlights:

1. This study focused on Papua, which had the highest infant mortality rate, using a multivariate approach to analyze various factors. Data from the IDHS 2017 and robust statistical analysis were expected to aid in formulating effective health policies.
2. The uniqueness of this research lies in its broader scope of variables, including education and employment, while considering the social and cultural context of Papua, providing new insights into infant health issues.

INTRODUCTION

Infant mortality persists as a critical global public health challenge. As reported by WHO (2022), approximately 2.4 million neonates died within their first month of life in 2020, equating to nearly 6,700 daily infant deaths that accounted for 47% of under-five mortality. This metric serves as a key indicator of regional and national welfare and healthcare quality. Beyond its profound psychosocial consequences for affected families, infant mortality adversely impacts socioeconomic development.[1]

The infant mortality rate (IMR) in Papua has decreased from 129 in 1971 to 38 in 2021. However, Papua still has the highest IMR in Indonesia. This requires attention from the government, health institutions, international organizations, and civil society. According to the 2020 Population Census, Papua's IMR is 38.17, meaning there are 38-39 infant deaths per 1,000 live births, more than twice the national average of 16.85.

As a sensitive population health indicator, IMR reflects healthcare system effectiveness, with lower values denoting superior service quality.[2] The Sustainable Development Goals (SDGs) target reducing IMR to ≤12 per 1,000 live births by 2030. Indonesia has implemented multifaceted interventions including facility-based deliveries attended by skilled health personnel and standardized neonatal care protocols. These measures have contributed to a 90% IMR reduction over five decades - from 26 (2010 Census) to 16.85 (2020 Census) per 1,000 live births. Expanded immunization coverage and prolonged breastfeeding duration have been key determinants of this improvement. According to Central Statistics Agency (BPS) 2022 data, Indonesia's national IMR reached 16.85, with Papua maintaining the highest regional rate (38.17).[3]

Established determinants of infant mortality encompass maternal age, antenatal care frequency, tetanus toxoid immunization status, delivery location and attendant, birth intervals, parity, maternal education, employment status, household income, residential location, and housing characteristics. Current IMR reduction strategies emphasize skilled birth attendance and standardized newborn care protocols. This study investigates the multifactorial determinants of infant mortality in Indonesia.

MATERIALS AND METHODS

This observational study employed a cross-sectional design to examine determinants of infant mortality in Papua Province. Conducted from January to March 2024, the investigation applied predetermined inclusion and exclusion criteria for participant selection. The final cohort comprised 658 female respondents (aged 15-49 years) who delivered infants between 2012-2017. Primary independent variables - maternal age, antenatal care frequency, tetanus toxoid immunization status, delivery location, and housing characteristics - were extracted from the Indonesian Demographic and Health Survey (IDHS) 2017. The study received ethical clearance from Universitas Airlangga Surabaya (Approval No. 60/EC/KEPK/FKUA/2024; February 29, 2024).

Analytical procedures progressed through three phases: Univariate analysis characterized frequency distributions for both the outcome variable (infant mortality) and predictor variables (including maternal characteristics, healthcare utilization metrics, and socioeconomic factors). Bivariate analysis assessed crude associations between independent and dependent variables through simple logistic regression (α=0.05, 95% CI). The final stage employed multiple logistic regression for multivariate modeling, incorporating variables demonstrating preliminary associations ($p<0.25$) while sequentially eliminating non-significant predictors ($p>0.05$). Model refinement continued until all retained variables achieved statistical significance ($p\leq0.05$), with monitoring of odds ratio stability throughout the elimination process.

RESULTS AND DISCUSSION

The study findings demonstrate respondent characteristics as detailed in Table 1. Potential covariates for multiple logistic regression analysis were selected from Table 2 based on a significance threshold of $p < 0.25$.[4] The qualifying variables included maternal age, antenatal care (ANC) attendance, tetanus toxoid immunization status, delivery location, and residential building characteristics.

Four hypotheses concerning infant mortality determinants were examined. Analytical outcomes revealed differential significance among these factors. First, antenatal care visits demonstrated no significant

Table 1. Characteristics of respondents

Characteristics	Frequency (n)	Percent (%)
Maternal age		
< 20 years	142	21.6
20-35 years	321	48.8
> 35 years	195	29.6
Pregnancy check-ups		
First ANC	492	74.8
Complete ANC	166	25.2
Tetanus toxoid immunization		
No	522	79.3
Yes	136	20.7
Maternity center		
No health facilities	157	23.9
Health facilities	501	76.1
Residential Building		
Not liveable	117	17.8
Liveable	541	82.2
Total	658	100.0

Table 2. Relationship of mother's age, pregnancy check-up, tetanus toxoid immunization, place of delivery, and building residence to infant mortality

Characteristics	Infant mortality				Total		ρ value n
	Die		Live				
	n	%	n	%	n	%	
Maternal age							
< 20 years	36	5.5	106	16.1	142	21.6	0.295
20-35 years	72	10.9	249	37.8	321	48.8	0.609
> 35 years	40	6.1	155	23.6	195	29.6	
Total	148	22.5	510	77.5	658	100.0	
Pregnancy check-ups							
First ANC	103	15.7	381	59.1	492	74.8	0.100
Complete ANC	45	6.8	121	18.4	166	25.2	
Total	148	22.5	510	77.5	658	100.0	
TT immunization							
No	123	18.7	399	60.6	522	79.3	0.199
Yes	25	3.8	111	16.9	136	20.7	
Total	148	22.5	510	77.5	658	100.0	
Maternity center							
No health facilities	49	7.4	108	16.4	157	23.9	0.003
Health facilities	99	15.0	402	61.1	501	76.1	
Total	148	22.5	510	77.5	658	100.0	
Residential building							
Not liveable	6	0.9	111	16.9	117	17.8	< 0.001
Liveable	142	21.9	399	60.6	541	82.2	
Total	148	22.5	510	77.5	658	100.0	

Table 3. Results of multiple logistic regression analysis variables

Variables	B	p-value	Adjusted Odds Ratio (AOR)	95% CI
Pregnancy check-up	0.135	0.548	1.144	0.738-1.775
Tetanus toxoid immunization	0.273	0.337	1.314	0.752-2.294
Maternity center	-0.660	0.003	0.517	0.333-0.803
Residential building	1.861	0.000	6.427	2.732-15.120
Constant	0.836	0.001	2.306	

association with infant mortality (p=0.548). Similarly, tetanus toxoid immunization showed no statistically significant relationship (p=0.337). However, delivery location significantly correlated with infant mortality (p=0.003), showing facility-based deliveries conferred 0.517-fold greater odds of infant survival versus non-facility deliveries. Lastly, residential conditions significantly impacted mortality (p=0.000), with substandard housing associated with 6.427-fold higher infant mortality risk (Table 3). These findings highlight the critical roles of delivery care quality and living environments in mortality reduction.

The association between maternal age and infant mortality was examined. Although the majority of respondents aged 20–35 years showed no statistically significant correlation,[5] adolescent pregnancies (<19 years) are associated with increased health risks[6] due to physiological reproductive immaturity. While maternal health status substantially affects neonatal outcomes,[7] the provision of adequate antenatal care and the presence of skilled birth attendants can substantially reduce these risks.

This study demonstrates that most pregnant women in Papua do not receive adequate antenatal care (ANC). Although previous studies have reported a link between ANC visits and infant mortality,[5] insufficient ANC visits that fail to meet established standards may elevate the risk of neonatal death.[8] Contributing factors include poor maternal nutritional status, such as Chronic Energy Deficiency (CED), and inadequate iron intake, which present critical challenges to maternal well-being in Papua.[9] Additionally, research indicates that demanding physical labor during pregnancy may delay or hinder ANC attendance, often shaped by socio-economic and cultural conditions.[9] While ANC remains vital to maternal and neonatal health, challenges in its delivery and quality—compounded by socio-economic constraints like CED and iron deficiency—continue to impede reductions in infant mortality in both Papua and Indonesia overall. Strengthened interventions are essential to enhance awareness, improve healthcare access, and elevate service quality for pregnant women.

This study further reveals that the majority of respondents received Tetanus Toxoid (TT) immunization, and prior research supports its efficacy in preventing neonatal deaths caused by tetanus infections.[10] Neonatal tetanus may arise from non-sterile delivery practices or maternal infections acquired prior to childbirth. TT immunization is a central component of the Maternal and Neonatal Tetanus Elimination (MNTE) program, aimed at ensuring hygienic and safe delivery practices.[11] According to data from the 2023 Papua Provincial Health Profile, complete basic immunization coverage plays a critical role in preventing infectious diseases that may result in infant death.[3] Although progress has been made in expanding immunization coverage in Papua, significant challenges persist in achieving full immunization among all children—highlighting the need for improved public awareness and healthcare access. Overall, TT immunization not only protects individuals from tetanus but also contributes to broader efforts to enhance maternal and child health. Greater public awareness and improved healthcare service delivery are key to reducing infant mortality due to vaccine-preventable diseases like tetanus.[12]

Most mothers in the study delivered in healthcare facilities, and the literature identifies a strong correlation between place of delivery and neonatal mortality rates.[13] This study supports evidence that births in health facilities—staffed by trained personnel and equipped with appropriate infrastructure—significantly reduce the risk of neonatal death compared to deliveries in unsterile or inadequately resourced settings. However, a study by Mogi & Anggraeni (2021) presents differing findings, suggesting that place of delivery may not independently influence infant mortality rates. Nevertheless, they emphasize that deliveries in well-equipped facilities are better positioned to manage complications that could otherwise result in neonatal death.[14] Data from the 2023 Papua Provincial Health Profile show a rising trend in the percentage of women delivering in healthcare institutions, yet persistent barriers remain in ensuring equitable access to quality care across both urban and rural areas.[15] Factors such as educational attainment, economic conditions, and maternal age further influence the decision-making process regarding place of delivery.[16]

In conclusion, although healthcare facilities provide a safer environment for childbirth, substantial efforts are still required to improve the quality and accessibility of services in order to reduce neonatal mortality in Papua Province. Ongoing strategies aimed at increasing community awareness about the benefits of facility-based deliveries and at enhancing health infrastructure are vital to improving maternal and child health outcomes.

The majority of survey participants reside in habitable housing structures, and a significant correlation has been identified between housing conditions and infant mortality rates. The health outcomes of infants are directly influenced by the physical integrity and sanitation of their living environments. Illnesses such as influenza, diarrhea, and typhoid commonly emerge in unsanitary settings, impeding infant development and

heightening the risk of neonatal mortality.[17,18] Gozali et al. (2023) demonstrated a strong association between the incidence of childhood diarrhea and the availability of proper sanitation facilities, such as functional toilets and closed waste disposal systems.[19] UNICEF Indonesia further reported that 88% of global child deaths due to diarrhea are attributable to poor sanitation and unsafe drinking water, which compromise child potential and lower overall human resource quality. The health of infants is also impacted by the structural quality of housing—specifically the building materials, architectural integrity, and overall community environment. These elements are closely tied to the household's socioeconomic status. The extent to which residential features such as walls, flooring, and roofing shield infants from environmental exposure and infectious agents significantly affects health outcomes. Notably, 83% of households in Papua with recorded infant deaths were categorized as residing in high-quality housing, whereas only 17% were in substandard housing. Low-quality homes are often characterized by inadequate heating, poor ventilation, structural deficiencies, overcrowding, and the presence of environmental health hazards such as mold, all of which exacerbate health risks among occupants.[20,21]

The study findings reveal significant associations between infant mortality and factors such as antenatal care, Tetanus Toxoid (TT) immunization, place of delivery, and the structural condition of residential housing. Among these, the quality of housing emerged as the most influential factor associated with infant mortality. The data underscore that housing conditions have a more profound impact on infant mortality compared to other variables. For example, Okech et al. (2021) assert that deficient housing—marked by poor construction and lack of essential facilities—substantially raises the risk of infant death.[22] Furthermore, Rahman et al. (2022) point out that access to high-quality prenatal services and secure living environments can markedly lower infant mortality rates.[23] Conversely, maternal age showed no statistically significant correlation with infant mortality in Papua Province, as evidenced by the 2017 Indonesia Demographic and Health Survey (SDKI). Routine antenatal visits and TT immunizations contribute to lowering infant mortality risks. Deliveries outside formal healthcare facilities remain linked to higher infant mortality rates, consistent with prior research findings.[24] The upward trend in facility-based deliveries, especially among economically advantaged mothers in urban areas, highlights the critical role of healthcare accessibility and quality services. Environmental cleanliness and structural housing conditions further influence infant well-being. Unhygienic surroundings and inadequate sanitation contribute to disease transmission, thereby hampering infant development and increasing the risk of death. This study emphasizes the importance of robust sanitation and hygiene practices in improving community well-being and reducing infant mortality. Ongoing interventions to enhance access to healthcare, improve service delivery, and upgrade housing conditions are essential to mitigating infant mortality risks, particularly within Papua Province.[5]

The research addressing infant mortality in Papua Province possesses distinct strengths and limitations. One notable strength is its high relevance, focusing on a region with the highest infant mortality rates in Indonesia, thus providing vital insights for public health advancement. The utilization of secondary data from the Indonesia Demographic and Health Survey (IDHS) ensures methodological reliability and data standardization. Moreover, the study conducts a comprehensive examination of multiple independent variables influencing infant mortality, offering a nuanced understanding of contributing factors. The results hold potential for informing effective public health policies in high-risk regions and enhancing community awareness of mortality determinants. However, the study also has certain constraints. The exclusive use of secondary data may introduce gaps in data coverage or potential biases in data collection. Establishing direct causal links between variables presents methodological challenges. Additionally, the study's geographic concentration on Papua may limit the extrapolation of findings to other regions in Indonesia. There may also be confounding or unmeasured factors influencing infant mortality that are not captured in the dataset. Lastly, the data represent conditions as of 2017 and may not fully reflect current epidemiological trends or health policy changes. Despite these limitations, the study provides valuable contributions toward strategies aimed at decreasing infant mortality rates in Papua.

CONCLUSION

This study highlights the substantial influence of residential housing quality on infant mortality rates in Papua Province. Although variables such as maternal age, antenatal care, and Tetanus Toxoid immunization are acknowledged as important, they do not demonstrate a statistically significant correlation with infant mortality. In contrast, deliveries conducted within healthcare facilities are associated with reduced infant death rates, emphasizing the critical importance of access to high-quality maternal healthcare services. Additionally, the structural integrity and sanitary conditions of residential environments emerge as key

determinants, with substandard housing conditions contributing significantly to heightened infant health risks. In conclusion, efforts to expand healthcare accessibility, improve housing quality, and strengthen maternal health education are imperative for reducing infant mortality in Papua and comparable settings.

DISCLOSURES

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Conflict of interests

The authors declare that there are no conflicts of interest regarding this research. All authors have contributed to, reviewed, and approved the final manuscript for publication.

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Author contributions

All authors have actively contributed to this study, each playing a distinct role in its conception, design, data collection, analysis, and manuscript preparation. Their collective efforts have been essential to the completion of this study.

REFERENCES

1. Chairani I. Provinsi Papua dalam angka [Papua Province in Figures] 2023 [Internet]. Available from: https://papua.bps.go.id/id/statistics-table/.
2. Abasali E, Irannezhad P, Jahanian R, et al. The role of informal learning and organizational learning capacity in learning motivation and professional ethics of faculty members in the Eastern Azerbaijan Universities. Iran J Educ Sociol. 2021;4(1):29–36. Available from: https://qijes.com/index.php/ijes/article/view/971/971
3. Badan Pusat Statistik Provinsi Papua. Provinsi Papua dalam angka [Papua Province in Figures] 2023 [Internet]. Badan Pusat Statistik Provinsi Papua. Available from: https://papua.bps.go.id/id/statistics-table.
4. Bursac Z, Gauss CH, Williams DK, et al. Purposeful selection of variables in logistic regression. Source Code Biol Med. 2008;3:17. doi: 10.1186/1751-0473-3-17. PMID: 19087314; PMCID: PMC2633005.
5. Bangun IF, Abdiana A, Edison E. Faktor risiko kematian neonatal di Kabupaten Kepulauan Mentawai [Neonatal death risk factor in Kepulauan Mentawai District]. Jurnal Katalisator. 2019;4(1):26.
6. Maghfiroh DR. Indikator Penting Provinsi Papua Edisi November 2023 [Vital indicators of Papua Province] [Internet]. Badan Pusat Statistik Provinsi Papua. Jayapura: Badan Pusat Statistik; 2023. Available from: http://repositorio.unan.edu.ni/2986/1/5624.pdf
7. Maghfiroh DR. Indikator kesejahteraan rakyat [People's wealth indicator]. Provinsi Papua 2023 [Internet]. Badan Pusat Statistik Provinsi Papua. 2023. 51–66. Available from: http://repositorio.unan.edu.ni/2986/1/5624.pdf
8. Sunarti, Padhila NI. Faktor yang berhubungan dengan resiko kematian neonatal [Factors related to risk of neonatal death]. An Idea Health J. 2023;3(01):1. Available from: https://ihj.ideajournal.id/index.php/IHJ/article/download/139/68/894
9. Sinaga VDMB, Mila II El, Nada AT, et al. Analisis tematik kependudukan Provinsi Papua. Fertilitas remaja, kematian maternal, kematian bayi, dan migrasi di Provinsi Papua [Population thematic analysis in Papua related to adolescent fertility, maternal death, infant death, and migration in Papua] [Internet]. Yudyatmoko P, editor. vol. 6, Badan Pusat Statistik Provinsi Papua. Papua: 2023. 51–66 p. Available from: http://repositorio.unan.edu.ni/2986/1/5624. pdf
10. Arub L, Seto A, Sitinjak HL, et al. Faktor-faktor yang mempengaruhi cakupan imunisasi tetanus toxoid pada ibu hamil di desa Tanjung Lamin Wilayah Kerja Puskesmas Simpang Limbur [Factors affecting toxoid tetanus immunization in pregnant women at Tanjung Lamin village]. J Kesehat dan Sains Terap. 2023;9(1):27–34.
11. WHO. Optimal timing of cord clamping for the prevention of iron deficiency anaemia in infants [Internet]. 2017. Available from: https://www.who.int/elena/titles/cord_clamping
12. Vonna AD, Adriani L. Arfiandi. Pengaruh penyuntikan vaksin TT (Tetanus Toksoid) pada saat hamil terhadap kejadian tetanus neonatorum [Effect of TT vaccine injection during pregnancy on the incidence of tetanus neonatorum]. Darussalam Indones J Nurs Midwifery 2020;1(1):13–20.

Available from: https://jurnal.sdl. ac.id/index.php/dij/article/view/24.
13. Rukmono P, Anggunan, Pinilih A, Yuliawat SS. Hubungan antara tempat melahirkan dengan angka kematian neonatal di RSUD DR. H. Abdoel Moeloek Provinsi Lampung [Correlation between site of birth and neonatal mortality rate in Lampung]. MAHESA Malahayati Health Student J. 2021;1(4):435–44. doi: 10.33024/mahesa.v1i4.3983
14. Mogi IRO, Anggraeni LD, Supardi S. Faktor-faktor yang berhubungan dengan kematian bayi di RSUD Ende [Factors related to infant mortality at Ende Hospital]. J Promosi Kesehat Indones. 2021;16(1):7–13. doi: 10.14710/jpki.16.1.7-13
15. Kuncaraning R, Yugiana E, Noviani A. Profil statistik kesehatan 2021 [Profile of health statistics] [Internet]. 5th ed. Harahap IE, Astuti SP, Ponco SH, editors. Badan Pusat Statistik. Jakarta: Badan Pusat Statistik; 2021.
16. Kusumawardani A, Handayani S. Karakteristik ibu dan faktor risiko kejadian kematian bayi di Kabupaten Banjarnegara [Maternal characteristics and risk factor of maternal mortality in Banjarnegara District]. J Promosi Kesehat Indones. 2018;13(2):168. doi: 10.14710/jpki.13.2.168-178.
17. Simbolon D. Kelangsungan hidup bayi di perkotaan dan pedesaan Indonesia [Infant survival rate in urban and rural area in Indonesia]. Kesmas Natl Public Health J. 2006;1(1):3. doi: 10.21109/kesmas.v1i1.319.
18. Wulansari N, Sari E. Pengaruh konseling KB terhadap pengetahuan dan sikap pasangan usia subur dalam memilih KB yang tepat [Effect of family planning conseling on knowledge and attitude in choosing appropriate family planning method]. Maternal Child Health Care. 2023;5(1):831. doi: 10.20527/jbk.v4i2.5854.
19. Gozali SI, Astutuik E, Ismail WI. Enviromental sanitation and diarrhea in children ages 12-59 months in Pojok Village, Bojonegoro, Indonesia. J Berk Epidemiol. 2023;11(2):120–7. doi: 10.20473/jbe.V11I22023.120-127.
20. World Health Organization. (2018). Housing and health guidelines. Geneva: World Health Organization. Available from https://www.who.int/publications/i/item/9789241550376
21. U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. Housing and health. Healthy People 2030. Available from https://health.gov/healthypeople/objectives-and-data/social-determinants-health/literature-summaries/housing
22. Okech JE, Abong GO, Wandera SO. The relationship between housing conditions and neonatal mortality in urban slums: Evidence from Kenya. BMC Public Health, 2021;21(1):432. doi: 10.1186/s12889-021-10442-7.
23. Mercer A, Haseen F, Huq NL, et al. Risk factors for neonatal mortality in rural areas of Bangladesh served by a large NGO programme. Health Policy Plan. 2006;21(6):432-43. doi: 10.1093/heapol/czl024. Epub 2006 Aug 30. PMID: 16943220.
24. Priyono, Kusumawati P. Studi fenomenologi penggunaan metode kontrasepsi jangka panjang di wilayah Kampung KB Desa Mlese, Ceper, Klaten [Phenomenological study on the use of long-term contraceptive method at KB Village of Mlese, Ceper, Klaten]. Jurnal Ilmu Kesehatan STIKES. Duta Gama Klaten 2020;1-6.