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Exploring the Factors Associated with Infant Mortality in Rural Indonesia

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Abstract

Infant mortality is a sensitive indicator to measure the health condition of a population. Despite large declines in infant mortality rates in Indonesia, the people living in rural areas are the most affected. This study aims to analyze the causes of infant mortality in rural Indonesia and suggested strategies for its reduction. This study is an analytical cross-sectional design based on the 2017 Indonesian Demographic and Health Survey (IDHS) dataset for children. The information on infant deaths collected from those mothers who experienced infant deaths. Series of logistic regression models were used to select the significant factors affecting infant mortality in rural Indonesia. Infant mortality is associated with intermediate social determinants such as birth order, birth weight, and breastfeeding status. Socio-demographic factors such as the educational status of mothers, wealth quintile, the smoking habit of the mother, age of mother at first delivery, and sex of the baby are also related to infant mortality. The most crucial factors in rural Indonesia were the age of first-time mothers. As a strategy for addressing the issue of infant mortality in rural areas, the result of the study highlights the need for decreasing adolescent pregnancies among the youngest age groups. Pregnant mothers in the youngest age group should be supported by quality maternal health services to ensure their pregnancies in healthy condition. The focus of breastfeeding promotion programs should be encouraged, particularly on early initiation and duration of breastfeeding.

Keywords: infant death, infant health, rural children

1. Introduction

Globally, the well-being and health status of families and communities are estimated indirectly by infant mortality. Infant mortality becomes a general indicator used for public health measurements across areas and periods (Ely et al., 2017). Sustainable Development Goals (SDGs) have set to reduce newborns deaths to at least as low as 12 per 1000 live births and under-5 mortality to at least as low as 25 per 1000 live births (United Nations, 2017; WHO, 2018). Thus, infant mortality analysis is very crucial for development planning and evaluation programs. Indonesia had experienced a further reduction in infant mortality rate from 59 deaths per thousand live births in 1988-1992 (BPS et al., 1991) to 24 deaths per thousand live births in 2015-2017 (BKKBN et al., 2018). Although some improvements made in recent years, infant mortality has not been quantified, particularly in rural Indonesia.

Further analysis indicated that relationships between socioeconomic characteristics and infant mortality were strong in rural areas than in urban areas. Earlier studies revealed that rural infants were faced with higher probabilities to experience deaths compared to urban infants (Ajaero & Owoh, 2013; Mustafa, 2008). Higher infant mortality associated with proximate risk factors that were more common in nonmetropolitan areas, including birth order (Kynast-Wolf et al., 2019), birth weight (Chen et al., 2016), and breastfeeding status (Banerjee, 2018; Sari, 2016). Infant mortalities were more likely to be related to exogenous socio-environmental determinants, such as the educational background of the mother (Kiross et al., 2019; Santos et al., 2016); wealth quintile (Adewuyi et al., 2017; Kumar & Singh, 2014; Mohamoud et al., 2019); smoking habits of the mother (Ratnasiri et al., 2020), age of mother at first delivery (Weldearegawi et al., 2015), and the sex of the baby (Byberg et al., 2017; Boghossian et al., 2018).

Based on earlier research, the association between birth order and infant mortality revealed a u-curve, in which both first-and later-infants had a higher probability of dying compared with those in the middle curve (Mishra et al., 2018; Modin, 2002). Mothers to first-born infants tended to be inexperienced and have fewer material resources to access health care facilities that can cause higher probabilities of infant deaths. As the number of children within a

family increase, mothers to third or later-born infants had more likely to experience parental pressure (Ahrens et al., 2017). Those mothers who had third or later-born infants were also less likely to initiate prenatal care, consume prenatal vitamins, and breastfeed compared with their earlier-born infants (Ahrens et al., 2017). Moreover, based on the hypothesis of biological depletion, later-born infants were more likely than their elder siblings to be less healthy since those infants were born to elder mothers who had delivered to some infants before, thus, physiologically less able to have tougher infants (Riodan et al., 2011; Hotz & Pantano, 2015).

The low-birth-weight had a greater probability of infant mortality. Infants weighing less than 2500 grams are more likely to experience visual problems due to pulmonary dysplasia (Travers et al., 2018), retinopathy of prematurity (Natarajan et al., 2019), respiratory infections (Everard, 2016), and heart illness (Hughes et al., 2017). Low birth infants have a higher probability of hospitalizations, developmental failure, and growth disorders particularly in the initial year of life (Liang et al., 2018; Vilanova et al., 2019).

Breastfeeding status is also very much associated with infant mortality. World Health Organization (WHO) suggested exclusive breastfeeding for six months continued breastfeeding up to 2 years of age to prevent children from diarrhea's (Shahid et al., 2019) and pneumonia's illness (Oktaria et al., 2017). Christian et al. (2015) had emphasized that breastmilk's nutrition is crucial for brain development, physical growth, gut maturity, preventing infection and inflammation, and promoting mother-infant attachment.

In regards to the association between socioeconomic status and infant and child mortality, Kiross et al. (2019) emphasized the effect of the educational background of the mother on decreasing infant mortality. Furthermore, Motsa et al. (2016) reveal a notion that the mother's schooling would influence the mother's knowledge of general nutrition and health care practices that might encourage those mothers to perform better health behavior and by altering the traditional marital relationships. Mother's education can increase the chance of infant survival by postponing women to marry and enter motherhood later and have fewer children, employ prenatal care, and vaccinate their children (Akter et al., 2015, Muj & Bhradwaj, 2015).

Previous studies also showed that parents living in lower wealth index had a higher risk of infant deaths. Ladusingh et al. (2016) stated that lower households' wealth had fewer capacities to access health care, public infrastructure, clean water, nutritious food, and a safe environment than higher household's wealth. A study conducted by Roy and Haque (2018) in Bangladesh pointed out that the mothers of the wealthy family were more likely to have 45% lower probabilities of experiencing infant mortality (OR = 0.55, CI =0.42-0.720) compared to the mothers who were from the impoverished family.

The smoking habit of mothers during pregnancy is closely linked with increased risks of infant deaths. Ding et al. (2017) revealed that compared with non-smoking mothers, smoking mothers in the United States have a higher probability of infant mortality [light smoking: adjusted odds ratio (aOR) = 1.21, 95% confidence interval (CI), 1.03-1.43; heavy smoking: aOR = 1.30, 95% CI, 1.12-1.52], correspondingly. Prenatal smoking mothers in The United States might cause short-and long-term health issues, neurologic, developmental, and neurosensory illnesses (Dietz et al., 2010).

Maternal age at first delivery is known to raise the odds of infant mortality. Kramer and Lancaster (2010) showed that young mothers faced immature physical growth that stimulates neonatal outcomes. In contrast, elder mothers had higher odds in the incidence of hypertension (Kozuki et al., 2013), gestational diabetes (Shepherd et al., 2017), and congenital abnormalities (Carolan & Frankowska, 2011).

The sex of infants corresponded with infant mortality. A study of Humphrey et al. (2012) revealed that male fetuses are more likely to be born pre-term than female fetuses due to respiratory distress syndrome, Sudden Infant Death Syndrome (SIDS), and other infectious diseases.

Hence, this study aims to analyze the impact of socio-demographic and proximate determinants on the incidence of infant death at the age of 0-11 months in rural areas of Indonesia. This study emphasizes education level, wealth quintile, sex of the child, maternal smoking habits, and age at first birth to the incidence of infant mortality. This study also identifies the association between breastfeeding patterns, birth order, and birth weight as proximate determinants of the incidence of infant mortality, especially in rural Indonesia.

2. Method

2.1 Data

The data were obtained from 2017 Indonesian Demographic and Health Survey (IDHS). The 2017 IDHS sampling frame was prepared using the 2010 Population Census block (SP 2010) (BKKBN et al., 2018). The survey represents 1,970 census blocks in urban and rural areas with a sample of 49,250 households obtained by female

respondents aged 15–49 years about 59,100 respondents (BKKBN et al., 2018). The sampling technique was applied in two stratified stages, the probability proportional to size (PPS) systematically selecting the size of the number of households stratified into urban and rural areas and sorted based on the wealth index of the 2010 Population Census (BKKBN et al., 2018). Systematic random selection was carried out on 25 households selected in the census block. Free downloadable data can be accessed by registering through the Demographic and Health Survey (DHS) website. This study used a questionnaire for women aged 15–49 years to collect information from women of childbearing age regarding the number of children born alive to a certain age, socio-demographic factors, and the closest determinant of the incidence of infant mortality.

2.2 Inclusion and Exclusion Criteria

The inclusion criteria of this study were: (1) women of childbearing age 15–49 years who are married or live together; (2) children born alive to 11 months; (3) babies who die between the ages of 0–11 months or before reaching their first birthday; and (4) age of fertile women living in rural areas. The exclusion criteria were infants living in urban areas. This study selected 43,787 infants as the initial sample. After that, the study excluded 78 infants who reported missing information on selected variables. Therefore, the final sample used in this study was 43,709 babies from villages in 34 provinces in Indonesia.

2.3 Key Explanatory Variables

The infant mortality rate is calculated based on the mother's statement in this case, whether the mother has successfully given birth and the baby survives until the age of 11 month. The birth order is classified into the third child or more, second child, and first child. Birth weight is classified as greater than or equal to 2500 grams and less than 2500 grams. Breastfeeding status is identified by whether the mother has breastfed her baby up to 11 months of age. The education status of the mothers is classified into secondary education or above, primary education, and no education at all. The wealth quintile variable is divided into rich, middle, and poor groups. The smoking habits of mothers were grouped into non-smoking mothers, mothers who smoked daily, and mothers who smoked infrequently. The age of mother at first delivery was categorized into less than 20 years, 20 to 39 years, and 40 to 49 years. The sex of an infant's variable consists of female and male infants.

The initial stage of the analysis was carried out using a descriptive approach through univariate analysis by describing the frequency distribution of the respondent characteristics of each variable. A stage is an inferential approach through bivariate and multivariate analysis. The bivariate analysis aims to explain the relationship between each predictor variable on the response variable, testing the relationship between the two variables with the chi-square test (El-Habil, 2012). The multivariate analysis aims to determine the effect of the overall predictor variable on the response variable. This influence is seen both simultaneously and partially through multiple logistic regression with p-value ≤ 0.05 so that there is an influence of predictor variables in this case socio-demographic factors and the lowest determinant on infant mortality variables. Also, risk factors were measured for predictor variables for the incidence of infant mortality using odds ratios (ORs) with 95% confidence intervals (CIs) (Kleinbaum & Klein, 2010). Data analysis in this study was calculated using R-4.0.2 for Windows.

2.4 Ethical Consideration

This study does not contain private records or confidential information. All procedures and surveys for the 2017 IDHS have been reviewed and permitted by the ICF International Institutional Review Board (IRB). The survey procedures have been considered by the ICF IRB, the Indonesian Ministry of Health, and the Indonesia National Population and Family Planning Board for the protection of human subjects and in compliance with Indonesia's laws and norms.

3. Results

3.1 Characteristics of Respondents

Samples that met the requirements for data analysis were 43,709 infants in rural Indonesia in which 2,050 infants had been declared died before the age of 11 months and 41,659 infants who had survived until the age of 11 months. Table 1 revealed the frequency distribution of the respondent characteristics in this study. The results of the descriptive analysis showed that the proportion of first and second birth order was more than 40% compared to the third or more birth order (13.5%). Only less than 1.3% of infants were born with low birth weight (<2,500 grams). The majority of mothers did not breastfeed their babies (83.0%). About 50.1% of mothers had graduated from primary school education, 59.1% of mothers came from the poor level of wealth quintile, and more than 90.0% of mothers had a non-smoking habit. More than 50 percent of the mothers were delivered their first infants at the age of 20-39 years (53.0%). The proportion of sex of infants born was nearly equal between females and males infants.

Table 1. Characteristics of infant mortality (0-11 month), rural Indonesia, 2017 (N=43.709)

Variable		N	%
Infant mortality (0-11 month)	No	41,659	95.3
	Yes	2,050	4.7
Proximate determinant factors			
a. Birth order	Third or more	5,907	13.5
	Second	19,708	45.1
	First	18,094	41.4
b. Birth weight	≥ 2.500 gr	43,150	98.7
	< 2.500 gr	559	1.3
c. Breastfeeding status	Yes	7,431	17.0
	No	36,278	83.0
Socio-demographic factor			
a. Educational status of mother	Secondary and above	19,836	45.4
	Primary	21,915	50.1
	No education	1,958	4.5
b. Wealth quintile	Rich	9,469	21.7
	Middle	8,426	19.3
	Poor	25,814	59.1
c. Smoking habit of mother	Not smoking	42,439	97.1
	Daily	511	1.2
	Infrequently	759	1.7
d. Age of mother at first delivery	< 20 year	20,289	46.4
	20-39 year	23,396	53.5
	40-49 year	24	0.1
e. Sex of infant	Female	21,183	48.5
	Male	22,526	51.5

Note: Author's calculation.

3.2 The Result of Bivariate Analysis

Table 2 shows the results of the bivariate analysis to determine the relationship between the incidence of infant mortality and the predictor variables, namely socio-demography and the proximate determinant. The statistical results of the chi-square test showed a significant relationship (p-value ≤ 0.05) between the incidence of infant mortality and the proximate determinants, including birth order, and breastfeeding status of the infants. However, the infant's birth weight did not significantly relate (p-value > 0.05) to the incidence of infant mortality in rural Indonesia. Socio-demographic factors, namely the educational status of the mother, wealth quintile, smoking habit of the mother, age of mother at first delivery, and sex of the infant revealed a significant association (p-value ≤ 0.05) to the incidence of infant mortality in rural Indonesia.

Table 2. Bivariate analysis between infant mortality (0-11 month) and proximate and socio-demographic factors, rural Indonesia, 2017

Variable			Infant mortality				*Chi square*	*p-value*
			No		Yes			
			N	%	n	%		
Proximate determinant factor								
a.	Birth order	Third or more	5,564	13.4	342	16.7	42.5	0.00**
		Second	18,919	45.4	790	38,5		
		First	17,176	41.2	918	44.8		
b.	Birth weight	≥ 2.500 grams	41,133	98.7	2,018	98.4	1.36	0.24
		< 2.500 grams	526	1.3	32	1.6		
c.	Breastfeeding status	Yes	7,230	17.4	201	9.8	78.8	0.00**
		No	34,430	82.6	1,848	90.2		
Socio-demography factor								
a.	Educational status of mother	Secondary and above	19,158	46.0	678	33.1	204.3	0.00**
		Primary	20,732	49.8	1,183	57.7		
		No education	1,769	4.2	189	9.2		
b.	Wealth quintile	Rich	9,172	22.0	296	14.4	120.0	0.00**
		Middle	8,119	19.5	308	15.0		
		Poor	24.368	58.5	1,446	70.6		
c.	Smoking habit of mothers	Not smoking	40,474	97.1	1,965	95.8	16.7	0.00**
		Daily	485	1.2	26	1.3		
		Infrequently	700	1.7	59	2,9		
d.	Age of mother at first delivery	20-39 year	22,524	54.1	871	42.5	117.5	0.00**
		< 20 year	19,116	45.9	1,174	57.3		
		40-49 year	19	0.05	5	0.2		
e.	Sex of infant	Female	20,275	48.7	907	44.2	15.3	0.00**
		Male	21,384	51.3	1,143	55.8		

Note. Author's calculation, IDHS 2017 ; *(p-value ≤ 0.1); **(p-value ≤ 0.05).

3.3 The Result of Logistic Regression Analysis

Table 3 revealed the results of the final model of multiple logistic regression. The second (OR: 0.88; 95% CI: 0.78-1.01) or third (OR: 0.73; 95% CI) birth order: (0.66-0.81) were more likely to have an incidence of infant mortality than the first birth order. The odds of infant mortality with low birth weight (LBW: < 2,500 gram) was 1.59 times higher (95% CI: 1.10-2.29) than normal birth weight (≥ 2,500 gram). Infant mortality of a mother who did not breastfeed her child was 1.87 times (95% CI: 1.61-2.18) relatively higher than those mothers who breastfeed their infants. Mothers who come from the poor wealth index have the highest chance of infant mortality, compared to mothers who came from middle and rich wealth index (OR: 1.58; 95% CI: 1.38-1.80). Infant mortality among uneducated mothers had the highest risk compared to educated mothers (OR: 2.23; 95% CI: 1.87-2.67). The possibilities of mothers who smoked daily was 1.44 times more likely (95% CI: 1.09-1.88) to cause infant mortality compared to a non-smoker mother. Those mothers who delivered their infants at the age of 40-49 years were more likely to be 6.10 times (95% CI: 2.18-17.08) of the incidence of infant mortality compared to those mothers who delivered their infants at the age of 20-39 years. The mothers who gave birth to their infants at the age below 20 years were 1.37 times higher odds (95% CI: 1.24-1.50) of the incidence of infant mortality compared to those mothers who delivered their infants at the age of 20-39 years. Mothers who had male infants

were 1.19 times more likely to experience infant mortality than mothers who had female infants.

Table 3. Multiple logistic regression model for determinants of infant mortality (0-11 month) in rural Indonesia, 2017

Variable		*OR*	*95% CI*	*p-value*
Proximate determinant factor				
a. Birth order	First	Ref		
	Second	0.88	0.78-1.01	0.06*
	Third or more	0.73	0.66-0.81	0.00**
b. Birth weight	≥ 2.500 grams	1		
	< 2.500 grams	1.59	1.10-2.29	0.01**
c. Breastfeeding status	Yes	1		
	No	1.87	1.61-2.18	0.00**
Socio-demographyc factor				
a. Education of mother	Secondary and above	Ref		
	Primary	1.34	1.21-1.48	0.00**
	No education	2.23	1.87-2.67	0.00**
b. Wealth quintile	Rich	Ref		
	Middle	1.08	0.92-1.27	0.35
	Poor	1.58	1.38-1.80	0.00**
c. Smoking habit of mother	Not smoking	Ref		
	Daily	1.44	1.09-1.88	0.01**
	Infrequently	0.79	0.53-1.18	0.24
d. Age of mother at delivery	20-39 year	Ref		
	< 20 year	1.37	1.24-1.50	0.00**
	40-49 year	6.10	2.18-17.08	0.00**
e. Sex of baby	Female	Ref		
	Male	1.19	1.09-1.31	0.00**

Note. Author's calculation, IDHS 2017; *(p-value ≤ 0.1); **(p-value ≤ 0.05).

4. Discussion

This study investigated the impact of socio-demographic and the proximate determinant factors on the incidence of infant mortality in rural Indonesia using data from the 2017 Indonesia Demographic and Health Survey. This research showed that the contribution of factors that influence the incidence of infant mortality still varied in rural areas in Indonesia. The results showed that birth order had a significant effect on the incidence of infant mortality (0–11 months). The higher birth order had a higher probability of the incidence of infant mortality (0–11 months) (Ahrens et al., 2017; Mishra et al., 2018). The birth order of the first and last children is more likely to be at risk of infant mortality than middle birth order (Mishra et al., 2018; Mustafa, 2008). The first birth order had higher odds of infant mortality since the mothers had no experience taking care of their first child. Thus, the first child had a higher chance of dying from preventable injuries (Thoma et al., 2019). However, the last birth order with a high number of births can reduce the chances of survival of the baby because maternal fatigue decreases the mother's ability to concentrate (Iwata et al., 2018), which can increase the incidence of postpartum fatigue (Thomas & Spieker, 2016), feeling tight Senol et al., 2019), and caused their babies to wean their breast milk earlier (Fata & Atan, 2018).

The logistic regression model shows that there is a significant influence between low birth weight (LBW: <2,500 grams) on the risk of infant mortality in rural areas in Indonesia. Infants who experience low birth weight have a

higher likelihood of infant mortality due to immaturity in humoral, multi-organ, and cellular immunity (Hughes et al., 2017). LBW is a determining factor that is closely related to the risk of infant mortality due to preterm birth or intrauterine growth retardation (Sovio et al., 2012). Other studies have shown that babies who are small at birth are more likely to experience infant mortality than babies with a standard size or larger (Dube et al., 2013; Khadka et al., 2015).

In rural areas in Indonesia, mothers who breastfeed their babies are more likely to reduce infant mortality than mothers who do not breastfeed. Previous research also showed that babies who have not been breastfed by their mothers have twice the risk compared to babies who are breastfed by their mothers (Sankar et al., 2015). The duration of breastfeeding in the first six months is one of the predictors of a significant reduction in infant mortality (Oktaria et al., 2017; Sankar et al., 2015). A study in South Africa showed that exclusive or partial breastfeeding reduces the risk of infant mortality (Motsa et al., 2016)

This study found that maternal education has a significant effect on infant mortality in rural Indonesia. Mothers with higher secondary education are more likely to experience infant survival than mothers with primary or uneducated education in rural Bangladesh (Akter et al., 2015). Increased maternal education leads to delays in age at first marriage, delays in the first delivery, and job opportunities for women (Kiross et al., 2019).

The wealth index, which is created by the resources owned by households, is very close to income (Ladusingh et al., 2016). Babies who have mothers with a low wealth index tend to have the highest risk of death compared to babies who have mothers from the middle to upper wealth index (Tall et al., 2018). Previous research has shown that the infant mortality rate is higher for mothers with poor and middle status compared to mothers with richer status (Khadka et al., 2015). Previous research from Ezeh et al. (2015) showed a significant effect of infant mortality in poor households, living in rural areas, and having uneducated mothers in Nigeria. Community-based interventions for mothers living in rural areas with low economic status are needed to increase the survival rate of children in rural Nigeria (Ezeh et al., 2015). Babies born to families with a higher wealth index and mothers with higher education tend to receive better nutrition, health care, and education to reduce the risk of infant mortality (Hosseinpoor et al., 2006).

This study also reveals a significant relationship between maternal smoking habits and the risk of infant mortality in rural Indonesia. The more often the mother smokes, the higher the likelihood of infant mortality (Cerda et al., 2017; Ratnasiri et al., 2020). Mothers who quit smoking reduce the risk of infant mortality (Johansson et al., 2009). Previous research found that there was an association between smoking, premature infant mortality, and sudden infant death syndrome (Dietz et al., 2010). Patrick et al. (2016) emphasized that there is a relationship between an increase in tax and cigarette prices with a decrease in infant mortality so that stakeholders can implement policies and strategies for increasing cigarette taxes in the context of preventing infant mortality.

Maternal age at first delivery is closely related to the incidence of infant mortality. It is shown by the logistic regression model that mothers at a young age (15–19 years) and the end of the reproductive period (40–49 years) are more likely to be at risk of experiencing infant death than those at first age. - when the mother is 20–39 years old. These results are in line with previous studies, where babies born to mothers aged 20–35 years have a 0.31 times lower risk of neonatal death than babies born to mothers aged less than 20 years and more than 35 years (Sari, 2016). It is also clear that delaying the age at first birth in women in their 20s reduces infant mortality and improves infant health (Finlay et al., 2011). Mothers who have male babies are more likely to have a higher risk of infant mortality than female babies. It is in line with research in South Africa that revealed that female infants tend to have a lower risk of infant mortality than male babies (Motsa et al., 2016). Previous research has shown a higher relationship between infant mortality in males than in females (Sovio et al., 2012).

This study finding indicates the need to allocate more to girl's education and family planning. The increasing number of women studying in schools will encourage the increased age at marriage and subsequently increase the age at first delivery and reduce adolescent pregnancies. It would address the teenage pregnancy issue and reduce the risk of infant mortality.

This study is limited to the number of variables that show a statistically significant relationship with the incidence of infant mortality in rural areas in Indonesia. In general, cross-sectional studies find it arduous to identify causality because exposure, as well as the measured results, collected at the same time, thus, can create a memory bias.

5. Conclusion

In conclusion, infant mortality is a vital indicator of community health and general development of a nation, since it reveals the social, economic, and environmental circumstances in which infants and their communities live,

including their health systems. The study indicates evidence of disparities in the reasons for infant mortality among divergent socio-demographic subclasses. Yet, in the face of dwindling infant mortality in rural areas of Indonesia, there is a vital prerequisite to classify that only the most significant determinants that affect infant mortality. Decrease in infant mortality rate in the proximate determinant factor was associated with normal birth weight, breastfeeding, number, and spacing of controlled and planned births. In this regard, the socio-demographic factors that can reduce infant mortality are associated with factors such as higher education, better economic status, the ideal age at first birth (not too young or too old), smoking habits, especially during pregnancy. Another factor is maintaining the health of the baby during the prenatal and postnatal periods, especially male babies who are more prone to death than female babies.

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Authors' Contributions

DKI: Conceptualized the design and overall study. She analyzed, interpreted the data, and prepared the manuscript. IE: Supported in statistical analyses, interpretation of data, and reviewed the manuscript, and provided inputs. EP: Critically reviewed the manuscript and provided inputs. All authors read and approved the final manuscript.

Ethics Approval

This study involves the analysis of anonymous publicly available secondary data and therefore no ethical approval was required.

Data Availability Statement

Data are available in a public, open access repository.

Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

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