

Determinant Infant Mortality Rate in Grobogan Municipality in 2019

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Abstract—**Infant Mortality Rate is an indicator of the quality of life welfare of a population in the world, especially children's health. The purpose of this research is to find out the factors that influence the part of the baby including the baby's birth weight, knowledge of pregnant women, income and nutritional status. This type of research is cross sectional with the population of infant mortality in Grobogan, Central Java in 2019. The sample of this study revealed a purposive sampling of 123 infants. The instrument used was Grobogan district medical record data in the form of maternal nutritional status during pregnancy and birth weight of the baby, while the questionnaire was used to determine knowledge and income. The results of this study indicate the influence of knowledge and nutritional status, while for the body beat of the baby's birth and income do not affect infant mortality at the age of 0-12 months.**

Keywords: Infant mortality rate, birth weight, income, nutritional statuses.

I. INTRODUCTION

Infant Mortality Rate is the number of passed away people before reaching their first year. It is stated in 1.000 life birth in the same year. Based on the data of the United Nations Children's Fund (UNICEF)¹, Indonesia was one of 10 countries that became the focuses of Every Child Alive campaign 2018. The other nine countries were Bangladesh, Ethiopia, Guinea - Bissau, India, Malawi, Mali, Nigeria, Pakistan, and Tanzania. The infant mortality rate in Indonesia is still high when it is compared with other South-East Countries. It is 4.6 higher than Malaysia, 1.3 higher than Philippine, and 1.8 higher than Thailand.

The high rate of infant mortality could raise to lower health statuses in a certain region². The infant mortality rate is a sensitive indicator to find out the level of a state's health. It even functions to measure a certain state advancement. The data of basic health research (Riskesdas) in 2018 showed that the national infant mortality rate prevalence in Indonesia had decreased annually. However, the infant mortality rate of Indonesia is still categorized higher than any other South-East country. It is 4.6 higher than Malaysia, 1.3 higher than Philippine, and 1.8 higher than Thailand. 10 provinces with highest infant

¹ UNICEF, WHO. (2018). Capture the Moment—Early initiation of breastfeeding: The best start for every newborn. *New York: UNICEF*.

mortality rate were North Maluku with 37/1.000 birth life, Papua with 35/1.000 birth life, Nusa Tenggara Bara with 33/1.000 birth life, South Borneo with 30/1.000 birth life, South Sulawesi with 26/1.000 birth life, South East Sulawesi with 25/1.000 birth life, Banten 23/1.000 birth life, Central Java with 22/1.000 birth life, Riau Island with 21/1.000 birth life, and Lampung with 20/1.000 birth life (Riskesdas, 2018).

The sociodemography factor becomes an influential factor of the Infant Mortality Rate in Grobogan municipality. They are such as age in which most of the expectant is still under the ideal age to pregnant (under 20 years old), the educational background level of the family (most of them had average background levels such as JHS and SHS), social economy condition, custom value system, the expectant behaviors (paying less attention to their pregnancy by consuming nutritious meals), and high rate of ill expectant due to comorbidities. Such cases with comorbidities increased quickly. They were such as preeclampsia (46%) and anemia (37%). They were found to cause a high mortality rate in Grobongan such as in 2018 with 36 cases. Then, per February 2020, there were 4 cases.

Therefore, this research aims to find out the correlation among cognition, birth weight, income, and nutritional status of the expectant toward IMR occurrence in Grobogan municipality 2019.

II. METHODS

This research applied a cross-sectional approach. The population consisted of infants who passed away with a maximum age of 12 months and recorded by the Health Institution of Grobogan municipality, Central Java. This research used purposive sampling by selecting five regencies with the highest infant mortality rate and recruiting the expectant who volunteered to fill in the questionnaire. There were 123 alive and dead infants.

The dependent variable consisted of infant mortality rate while the dependent variables were cognition, birth weight, nutritional status while pregnant, and income. This research used primary data such as the statement about cognition, nutritional status, and income; and the secondary data about the birth weight that was taken from the health Institution

² Kemenkes, R. I. (2018). Hasil Utama Riset Kesehatan Dasar Tahun 2018. *Kementerian Kesehatan Republik Indonesia*, 1-100.

of Grobogan municipality. It was specifically for dead infants aged between 0-12 months in 2019.

Before collecting the data, the researcher had to deal with the Ethical Clearance in Universitas Negeri Semarang. The data collection technique consisted of questionnaire distribution and interviews. The data was taken from the health institution. The techniques of analyzing the data consisted of univariate and bivariate analysis with a chi-square test.

III. FINDINGS AND DISCUSSION

This research was done in Grobogan municipality in 2019. 123 samples consisted of dead infants and alive infants aged 0-12 months that were completely recorded medically by the health institution of Grobogan municipality. The research data were processed in univariate and bivariate manners. The findings are explained in Table 1.

Table 1 The Research Data Description

Type	Frequency	Percentage (%)
Birth Weight		
1. >4000 gram	6	41.5
2. 2500 - 4000 gram	66	53.7
3. <2500 gram	51	4.9
Cognition		
1. High	86	69.9
2. Low	37	30.1
Income		
1. High	79	64.2
2. Low	44	35.8
Nutritional Status		
1. High	58	47.2
2. Low	65	52.8
Mortality		
1. Alive	69	56.1
2. Dead	54	43.9

Table 1 shows the mortality rates of infants aged 0-12 months were 123 infants. 53.7% of the birth weight was normal. It was between 2.5-4 Kilograms. From the description of the statistics in Table 1, high cognition and income were found more frequently than those with low cognition and income. Meanwhile, low nutritional status was still the main cause of infant mortality.

The bivariate analysis results, by using chi-square, showed there was a correlation between the birth weight, cognition, income, and nutritional statuses of the expectant toward infant mortality rate as shown in Table 2.

Table 2 The Chi-Square Test of Infant Mortality Factor

Type	Types of Mortality		P-Value	OR (95% CI)
	Dead	Aliv e		
Birth Weight				
1. Normal	34	32	0.270	0.66 (0.325 – 1.371)
2. Abnormal	35	22		
Cognition				
1. High	34	52	0.000	0.037 (0.008 – 0.166)
2. Low	35	2		
Income				
1. High	41	38	0.209	0.6 (0.289 – 1.31)
2. Low	28	16		
Nutritional Status				
1. High	10	48	0.000	0.21 (0.007 – 0.06)
2. Low	59	6		

Table 2 shows some of the birth weights are not normal thus they lead to neo-natal mortality with 35 cases. However, the distribution of the birth weight mortality data on neonatal and post-neonatal is not significantly different. The chi-square analysis of the social environment obtains a *p-value* of 0.27. It is higher than 0.05. Thus, it could be concluded there was no correlation between birth weight and mortality occurrences. The findings showed that the most frequent infant mortality occurred when the birth weight was not normal or not between 2.5 - 4 Kg. The average of abnormal birth weight in this research showed birth rates with lower birth weight. Infants with abnormal birth weight still could survive although their condition was not healthy. Therefore, the abnormal birth weight did not influence the infant mortality rate in Grobogan municipality 2019. It was in line with a study conducted by Raharni (2011). She found there was no correlation between the birth weight and mortality rate.³

Table 2 also shows the chi-square analysis results with a *p-value* of 0.000. The value is lesser than the significant score, 0.05. Thus, it could be concluded there was a correlation between the expectant' cognition and the mortality rates. It was found higher cognition led to higher life opportunities of the infants. From the correlation between cognition and mortality rate, it was in line with a study conducted by Warsita (2015). He found there was an influence between education toward infant mortality.⁴ Expectant with better cognition could think the best of themselves and their infants. Higher education of the expectant led to better decision making. It meant that health service during pregnancy could prevent any problems as soon as possible for both the expectant and their fetus. Edrin (2014) stated the influential characteristics of expectant to

³ Raharni, R., Isakh, B. M., & Diana, I. (2011). Profil Kematian Neonatal Berdasarkan Sosio Demografi dan Kondisi Ibu Saat Hamil di Indonesia. *Buletin Penelitian Sistem Kesehatan*, 14(4), 20980.

⁴ Warsita, W. M., & Marhaeni, A. A. I. N. (2015). Pengaruh PDRB Perkapita, Pendidikan Ibu, dan Pelayanan Kesehatan Terhadap Angka Kematian Bayi di Provinsi Bali.

mortality risk dealt with the background knowledge of the expectant⁵. Luke (2017) stated in his research, conducted in the United State of America, that the expectant' cognition could influence the infant mortality rate with *p-value* = 0.000. It was due to their nescience about how to keep their pregnancy healthy could affect their pregnancies.⁶

Table 2 also shows the chi-square analysis results with *p-value* 0.209. The value is lesser than the significant score, 0.05. Thus, there was not a correlation between the incomes and the mortality rates of the infants aged between 0-12 months. Income did not influence infant mortality since in this research it was higher than the minimum regional wage of Grobogan municipality in 2019 or categorized high. Income did not influence the infant mortality rate. It was in line with previous studies conducted by Warindra (2012) and Aisyan (2013). They found that economic status was not the main factor in infant mortality.^{7,8}

Table 2 also shows the chi-square analysis results of the correlation between the nutritional status of the expectant during pregnancy with *p-value* 0.000. The value is lesser than the significant score, 0.05. Thus, it could be concluded there was a correlation between the nutritional status of the expectant toward the mortality occurrence. It was specifically dealing with the lower nutritional status that made the survivability of the infants getting lower. This research is in line with Rofiah (2014). She found that the nutritional status of expectant influenced the infant mortality rate.⁹ Besides that, the expectant that was lack of certain nutrition during pregnancy could raise into imperfect infant growth. If the expectant had lower calories, it could raise into malnutrition or lack of chronic energy. It was indicated by LILA < 23.5 cm¹⁰. Lack of chronic energy could cause the expectant had not adequate nutrient reserves to support the physiological of pregnancy. It is a change of hormone and increases the blood volume for fetus development. Thus, the nutrient supply for the fetus

decreases. It could hinder the growth and development of the fetus¹¹(Mariyatul, 2016).

IV. CONCLUSION

The findings showed that there was no significant correlation between income and birth weight toward the mortality rate of infants aged 0-12 months in Grobogan, 2019. In fact, from the income and the birth weight, it was found that nutritional status and the expectant' cognition could influence the infants' survivability.

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⁵ Edrin, V. L., Ariadi, A., & Irawati, L. (2014). Gambaran karakteristik ibu hamil pada persalinan preterm di RSUP Dr. M. Djamil Padang tahun 2012. *Jurnal Kesehatan Andalas*, 3(3).

⁶ Luke, B., Gopal, D., Cabral, H., Stern, J. E., & Diop, H. (2017). Pregnancy, birth, and infant outcomes by maternal fertility status: the Massachusetts Outcomes Study of Assisted Reproductive Technology. *American journal of obstetrics and gynecology*, 217(3), 327-e.

⁷ Aisyan, S. D. S., Jannah, S. N., & Wardani, Y. (2013). Hubungan antara status sosial ekonomi keluarga dengan kematian perinatal di wilayah kerja Puskesmas Baamang Unit II Sampit Kalimantan Tengah Januari-April 2010. *Kes Mas: Jurnal Fakultas Kesehatan Masyarakat Universitas Ahmad Daulan*, 5(1), 24903.

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