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Analysis of socio-economic factors affecting infant mortality rate in Indonesia

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ABSTRACT

In 2015, the world begins working toward a new global development agenda, seeking to achieve, by 2030, new targets set out in the Sustainable Development Goals (SDGs). The proposed SDG target for child mortality aims to end, by 2030, preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births. Based on the background, the purpose of this study is to describe the trends and characteristics of Infant Mortality Rate (IMR) in Indonesia, and to analyse the factors affecting them. The factors use in this study are population, GDP per capita, women's level of education, and women's labor force participation rate, to formulate strategies or policies to reduce IMR in Indonesia. This study uses the VAR / VECM method, to show the short-term and long-term relationships between these factors and IMR. The results showed the negative of IMR trend during the study period of (1955-2015). VAR / VECM analysis showed that in short and long term, GDP per capita had negative effect on IMR, infant mortality, as well as in the long term. Population positively affect IMR in the short term, however it produces negative impact to IMR in long term. Both women's education level and women's labor force participation rate have negative effect to IMR in the short term, whereas in long term both they positively effect to IMR.

Keywords: IMR, GDP per capita, population, women's net enrolment ratio and women's labor force participation rate.

INTRODUCTION

Development is essentially a continuous process between the various dimensions, such as social, economic, and environmental to improve the welfare of the society. In the implementation, all developmental efforts tends to exploit the natural resources without considering the environmental aspect. This trend was started to shift after the 1972 Earth Summit in Stockholm, to oblige with the agreement on the relationship between environmental issues related to sustainable development. Since then the concept of environmentally-friendly development is implemented. Advancing to the Millenium Development Goals (MDGs) era (2000-2015) which is aimed to achieve eight goals, namely: reducing poverty and hunger, completing the primary education level, promote gender equality, reduce child and maternal mortality, tackle HIV / AIDS and other diseases, ensuring environmental sustainability and forming partnerships in the implementation of development.

MDGs era is replaced with Sustainable Development Goals (SDGs) during period 2015-2030, which has more universal goals. SDGs aim to cpoe with the challenges of the future world. By the end of 2015, Indonesia is likely to fail to achieve the MDGs targets. Even some of the

provinces in Java like West Java, Central Java and East Java are struggled with (Handbook of SDGs, 2015). Targets that have the potential to fail include: (SDGs Handbook, 2015): Decrease in maternal mortality; Decrease in infant and under-five mortality rate; Decrease in AIDS / HIV rate; Coverage of drinking water and sanitation.

Using an estimate derived from Indonesia IDHS child health status is improving. This is indicated by the lower rates of neonatal mortality, infant mortality and under-five mortality. The under-five mortality rate declined from 97 per thousand live births in 1991 to 44 per thousand live births in 2007. Infant mortality decrease from 68 per 1,000 live births in 1991 to only 34 per thousand live births in 2007 (IDHS 2007, MDG's 2010 and WHO 2007 and 2011).

However, when compared to the results of the IDHS 2002-2003 and IDHS 2007 decreasing of neonatal mortality, infant mortality and under-five mortality tend to stagnate. The main causes of infant mortality are neonatal problems (asphyxia, low birth weight and neonatal infection), infectious diseases (mainly diarrhea and pneumonia) as well as closely related to nutrition problems (malnutrition and malnutrition). Another problem is the disparity in neonatal mortality rate, infant mortality and under five mortality rate is quite high between provinces. This condition is caused by problems of access and quality of health services, socioeconomic and cultural issues, infrastructure growth and openness of the region in promoting economic development and education (IDHS 2007, MDG's 2010 and WHO 2007 and 2011).

Associated with the beginnings of SDGs, Indonesia has a new challenge to achieve the objectives of SDGs. One of the 17 goals of SDGs is Point Number 3 which is good health, in the sense of ensuring a healthy life and encouraging welfare for all people of all ages. The third goal of SDGs is the coverage of three goals in the MDGs era, namely decreasing maternal mortality rate, decreasing infant mortality rate, and decreasing AIDS / HIV (Ministry of Health RI, 2015). In order to reduce infant / under-five mortality rates, SDGs have a target on 2030 to terminate preventable infant and under-five mortality, with all countries attempting to reduce the Neonatal Mortality Rate to at least 12 per 1,000 live births and under-five mortality at least 25 per 1,000 live births (Ministry of Health RI, 2015).

METHODS

The data used in this research is secondary data, with research location is State of Indonesia, using Time Series data from 1955 until 2015. Secondary data obtained from World Bank, Ministry of Health Republic Indonesia, Central Statistics Agency, Ministry of Education and Culture of the Secretariat General of the Central for Data and Statistics of Education, and from various survey results such as the SDKI and other relevant sources.

To determine how much influence the growth of population, GDP per capita, the level of female education and female labor force participation rate to dependent variable infant mortality rate that is carried *Vector Auto Regression* analysis. The VAR approach is used to detect the effect of reciprocity or dynamic two-way causality between independent variables and the dependent variable in this study.

If the observed data is stationary at first difference, then the VAR model will be combined with an error correction model to cointegrated VAR or Vector Eros Correction Model (VECM). In addition, in this study will be described impulse response function and variance decomposition which is the property of the VAR model. It is used to see shocks from innovation variables to other variables.

The basic model will be used in this study is referring to the model used by Naveed T.A et. al (2011) in researching the socio-economic factors that determine infant mortality rate in Pakistan. Adapting the research undertaken by Naveed T.A et. Al (2011) then the model specifications presented in this research are as follows:

$$IMR = \beta 0 + \beta 1\, NUM\_POP + \beta 2\, GDP + \beta 3\, RAPMP + \beta 4\, TPAKP + \mu$$

Where:
IMR = Infant Mortality Rate
NUM_POP = Number of Population
GDP = GDP per Capita
RAPMP = Women enrollment ratio at primary level
TPAKP = Female labor force participation in working sector

RESULTS AND DISCUSSIONS

Testing procedure conducted in this research is, first unit root test at level and 1st difference is used to determine whether each variable is stationary or non-stationary. By following the standard unit root testing procedure using Augmented Dickey Fuller (ADF) test developed by Dickey and Fuller (1979). From the test above, all variables have met the stationarity requirements of the data from the ADF test, where the ADF probability value is smaller than the α value (in this study used α 5% or 0.05) at the first difference level. Therefore all data variables already stationary at the level of the first difference, then do the next step in the VECM estimation, namely the determination of the optimal lag length.

Before performing Cointegration Test it is necessary to determine the lag length that used in this study. Estimating the lag length in an autoregressive process in time series data is the most important part of econometrics. The selected lag is a lag that has a minimum value between the lag length criteria. In this study used all the criteria to choose the length of lag. The results showed that the optimal lag length was 5.

After the order of integration of each variable (unit root test) and the lag length criteria have been determined, and will be conducted Co-integration Test. The co-integration test means that data from a linear combination of two variables can be stationary even though the individual variables are non-stationary (Gujarati 1995). Testing co-integration intended to determine the long-term relationship of each variable. The requirement in VECM estimation, if there is a co-integration relationship in it. If there is no integration relationship, then VECM estimation is canceled, but must use VAR (Vector Autoregression) model. In this research, co-integration testing is used Johansen's 71 Co-integration Test method which is available in software e-views with critical value 00,5. The following table will show the results of co-integration tests for this study.

Based on the table above it can be seen that the value of trace statistic and maximum eigenvalue at r = 0 is smaller than critical value with 5% significance level, this means Ho is rejected and H1 accepted or in other words, variables used have relationship in long term. Based on the econometric analysis above it can be seen that among the four variables in this study, there are five cointegrating at the 5% significance level. According the results of co-integration tests indicates that between number of population (Pop), GDP per capita (GDP), Labor Force Participation Rate (TPAKp), and Women enrollment ratio (RAPMp) Infant Mortality Rate (IMR) has no relationship stability or balance and equality movement in the long run.

Tabel 1. Unit Root Test

Variable	Level		1st difference	
	t-statistic	Prob	t-statistic	Prob
LOG_IMR	-2.655117	0.2586	-7.716739	0.0000
LOG_GDP	-4.952425	0.0009	-6.904362	0.0000
LOG_NUM_POP	-2.291399	0.4315	-2.240456	0.0254
LOG_RAPMP	-6.870993	0.0000	-5.953115	0.0000
LOG_TPAKP	-3.384272	0.0632	-7.318629	0.0000

Table 2. Determination of Lag Length

Lag	LogL	LR	FPE	AIC	SC	HQ
0	670.8083	NA	3.24e-17	-23.77887	-23.59803	-23.70876
1	1179.099	907.6625	1.04e-24	-41.03926	-39.95425*	-40.61860
2	1227.060	77.07989	4.67e-25	-41.85929	-39.87010	-41.08809
3	1248.705	30.92129	5.57e-25	-41.73946	-38.84611	-40.61772
4	1293.054	55.43627	3.12e-25	-42.43050	-38.63297	-40.95820
5	1332.542	42.30873*	2.25e-25*	-42.94793*	-38.24623	-41.12509*

Table 3. Cointegration Test

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.511404	97.37029	69.81889	0.0001
At most 1 *	0.356513	55.82951	47.85613	0.0075
At most 2 *	0.213342	30.26003	29.79707	0.0442
At most 3 *	0.187206	16.34225	15.49471	0.0372
At most 4 *	0.071779	4.320172	3.841466	0.0377
Trace test indicates 5 cointegrating eqn(s) at the 0.05 level				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.511404	41.54078	33.87687	0.0050
At most 1	0.356513	25.56948	27.58434	0.0885
At most 2	0.213342	13.91778	21.13162	0.3718
At most 3	0.187206	12.02208	14.26460	0.1098
At most 4 *	0.071779	4.320172	3.841466	0.0377
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				

Table 4. Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
LOG_GDP does not Granger Cause LOG_IMR	59	6.06199	*0.0042
LOG_IMR does not Granger Cause LOG_GDP		6.35601	*0.0033
LOG_NUM_POP does not Granger Cause LOG_IMR	59	6.59507	*0.0027
LOG_IMR does not Granger Cause LOG_NUM_POP		5.00817	*0.0101
LOG_RAPMP does not Granger Cause LOG_IMR	59	2.58456	0.0847
LOG_IMR does not Granger Cause LOG_RAPMP		8.51777	*0.0006
LOG_TPAKP does not Granger Cause LOG_IMR	59	1.35948	0.2654
LOG_IMR does not Granger Cause LOG_TPAKP		2.85157	0.0665
LOG_NUM_POP does not Granger Cause LOG_GDP	59	6.60637	*0.0027
LOG_GDP does not Granger Cause LOG_NUM_POP		19.9424	3.E-07
LOG_RAPMP does not Granger Cause LOG_GDP	59	4.66951	*0.0135
LOG_GDP does not Granger Cause LOG_RAPMP		2.70847	0.0757
LOG_TPAKP does not Granger Cause LOG_GDP	59	2.06256	0.1370
LOG_GDP does not Granger Cause LOG_TPAKP		1.94535	0.1528
LOG_RAPMP does not Granger Cause LOG_NUM_POP	59	0.54274	0.5843
LOG_NUM_POP does not Granger Cause LOG_RAPMP		19.9011	3.E-07
LOG_TPAKP does not Granger Cause LOG_NUM_POP	59	0.06210	0.9399
LOG_NUM_POP does not Granger Cause LOG_TPAKP		4.90265	*0.0111
LOG_TPAKP does not Granger Cause LOG_RAPMP	59	5.21772	*0.0085
LOG_RAPMP does not Granger Cause LOG_TPAKP		3.02043	0.0571

Granger's Causality is used to examine the causal relationship between the two variables. The predictive power of previous information may indicate a causal relationship between y and z in the long term. The probability values that exist in the research of granger quality should be considered. If the value is greater probability of 0.05, we conclude causality between variables does not occur, while having a causal relationship is one that has a probability value of less than alpha Ho

0:05 so that later will be rejected, which means a variable affects the other variable, hypothesis used:

Ho: The dependent variable is not significantly influenced by the independent variable.

H1: The dependent variable is significantly influenced by the independent variable.

From the Granger test above, we know the interrelationship / causality between LOG_GDP and LOG_IMR variables, as well as LOG_NUM_POP with LOG_IMR. Meanwhile, for the relationship of two other variables LOG_RAPMP with LOG_IMR and LOG_TPAKP with LOG_IMR there is no reciprocal relationship.

The VAR / VECM approach requires structural model by each endogenous variable in the system as a function of the lagging value of all endogenous variables in the system. On the other hand, it also allows for the adjustment of short-term dynamics. In the co-integration test shows that there is a long-term equilibrium relationship or no co-integration between all variables in 1st difference, so we can use the model to estimate the variable VECM.

Infant Mortality Rate (IMR) Assessment in the Short Term

For GDP Per capita (GDP) variable, in the third and fourth lag which statistically affects the infant mortality rate (IMR) in the current period and only on the significant level of 10%. The coefficient value obtained in the third lag is -0.053685. This means that if there is an increase in GDP per capita (GDP) 1%, then Infant Mortality Rate (IMR) in the current period will decrease by 0.053685%. This is in accordance with the hypothesis and also some previous studies, one of which is Rezai, Moradi, and Martin (2015) who found a negative and significant relationship between GDP per Capita (GDP) to infant mortality. Where, GDP per capita is often used to measure the prosperity and the level of development of a country; the greater the income per capita, the more prosperous the country.

For the Number of Population (NUM_POP) variable, only the first lag statistically affects Infant Mortality Rate (IMR) in the current period at significant level of 1%, 5% and 10%. Coefficient value obtained is 2.256874. This means that if there is an increase in the number of population (NUM_POP) 1%, then Infant Mortality Rate (IMR) in the current period will increase by 2.256874%. This is in accordance with the hypothesis and also some previous studies, one of them from Naveed T.A et. al (2011) who found a positive and significant relationship between the Number of Population (NUM_POP) of infant mortality rate. Where increased population growth will lead to maximum utilization of resources resulting in decreased household income levels, if household income declines will also affect the health of the family, especially maternal health. This will lead to an increase in infant mortality.

For the Women enrollment ratio at primary level (RAPMP), statistically has negative effect on lag 1,2,3,4 and 5 on Infant Mortality Rate (IMR) in the current period at the significant level of 1%, 5% and 10%. In this case we take example at the first lag with coefficient value obtained is -0.507899. This means that if there is an increase in Women enrollment ratio (RAPMP) 1%, then Infant Mortality Rate (IMR) in the current period will decrease by 0.507899%. This is consistent with the hypothesis and also some previous studies, Kumar (2015) who found a significant negative correlation between education and women against infant mortality. Children born to under-educated mothers generally have a higher risk of death than those born to more educated mothers. During the period of 1998-2012, infant mortality from uneducated mothers was 66 per 1,000 live births. (Ministry of Health RI, 2012).

While for female labor force participation rate (TPAKP), statistically negative effect on lag 1,2, and 5 to infant mortality rate (IMR) in the current period at significant level of 1%, 5% and 10%. In this case we take example only at the first lag with the coefficient obtained is -0.360056. This means that if there is an increase in the Women's Labor Force Participation (TPAKP) 1%, then Infant Mortality Rate (IMR) in the current period will decrease by 0.360056%. This is in accordance with the hypothesis and also some previous studies, Wellington (2014) who found a negative and significant relationship between the Labor Force against the infant mortality rate. Since the Women's Labor Force is associated with an increase in household opinion, if household incomes increase, access to health facilities may increase, such as the availability of basic food and also adequate nutrition for the survival of infants.

Table 5. Estimation results for Equation VECM in Infant Mortality Rate (IMR)

Variabels	Coefisien	T-statistic	Expalanation
	Short Term		
D(LOG_IMR(-1))	-0.681846	-4.29718	Significant
D(LOG_IMR(-2))	-0.022714	-0.11996	Not Significant
D(LOG_IMR(-3))	0.473318	2.76881	Significant
D(LOG_IMR(-4))	0.327673	1.72656	Significant
D(LOG_IMR(-5))	-0.390550	-2.84360	Significant
D(DLOG_GDP(-1))	-0.016495	-0.76534	Not Significant
D(DLOG_GDP(-2))	0.032590	1.11208	Not Significant
D(DLOG_GDP(-3))	-0.053685	-1.98072	Significant
D(DLOG_GDP(-4))	-0.051448	-1.84343	Significant
D(DLOG_GDP(-5))	0.007978	0.34686	Not Significant
D(LOG_NUM_POP(-1))	2.256874	2.80581	Significant
D(LOG_NUM_POP(-2))	-0.903816	-1.05237	Not Significant
D(LOG_NUM_POP(-3))	0.488656	0.58518	Not Significant
D(LOG_NUM_POP(-4))	0.861507	0.98484	Not Significant
D(LOG_NUM_POP(-5))	0.882388	1.20590	Not Significant
D(LOG_RAPMP(-1))	-0.507899	-2.41315	Significant
D(LOG_RAPMP(-2))	-0.511747	-2.61060	Significant
D(LOG_RAPMP(-3))	-0.389748	-2.00484	Significant
D(LOG_RAPMP(-4))	-0.430822	-3.14237	Significant
D(LOG_RAPMP(-5))	-0.562930	-4.31402	Significant
D(LOG_TPAKP(-1))	-0.360056	-1.99935	Significant
D(LOG_TPAKP(-2))	-0.350163	-2.11919	Significant
D(LOG_TPAKP(-3))	-0.209009	-1.34925	Not Significant
D(LOG_TPAKP(-4))	-0.176031	-1.17894	Not Significant
D(LOG_TPAKP(-5))	-0.559470	-3.62625	Significant
C	-0.059523	-2.73551	
CointEq1	0.04468	3.04828	
	Long Term		
DLOG_IMR(-1)	1.000000		
DLOG_GDP(-1)	-0.440037	-1.71748	Significant
DLOG_NUM_POP(-1)	-1.376053	-5.28367	Significant
DLOG_RAPMP(-1)	16.91133	3.21718	Significant
DLOG_TPAKP(-1)	11.94221	7.63157	Significant
C	-42.25042		

Note: Values in ( ) are standard error while in [ ] shows the t-values at 1%, 5%, and 10% level of significance.

Infant Mortality Rate (IMR) Assessment on Long Term

Based on the results of long-term estimates, it can be seen that the GDP Per capita (GDP) has a negative relationship and has a significant effect on Infant Mortality Rate (IMR) at significant level of 10% with coefficient value for GDP Per capita (GDP) is -0.440037. This means that if there is an increase in GDP per capita (GDP) 1%, will cause the decrease in Infant Mortality Rate (IMR) in the long term by 0.440037%. This is consistent with the hypothesis and previous studies. Both short-term and long-term, income per capita (GDP) is still negative and significant effect on infant mortality, with the coefficient on the long-term greater than the coefficient on the short term.

Meanwhile, based on long-term estimation results, the number of population variable (NUM_POP), in the first lag has a negative relationship and significantly influence the Infant

Mortality Rate (IMR) at significant level of 1%, 5%, and 10% with coefficient value for Number Population (NUM_POP) is -1.376053. This means that if there is an increase in the number of popuation (NUM_POP) 1%, will cause a decrease in Infant Mortality Rate (IMR) in the long term by 1.376053%. Long-term results are opposite to short-term, which in the short term has a positive relationship. However, the same case is also found in previous research conducted by Conroy (2015) who examined the relationship between economic indicators, health and IMR in developed and developing countries. This analysis uses panel data from the World Bank and Human Development Report at the UN in 2005, 2009, and 2012. Using the determinants of IMR do vary between developed and developing countries. In the case of developing countries GDP per capita, population density, expected years of education for females, and incidence of Tuberculosis per 100,000 were determined to be significant determinants of IMR. The results indicate that the economic indicators of population growth and unemployment rate for both developed and developing countries in the panel data model have a negative relationship, when the expected relationship is positive.

Based on the results of long-term estimation, the Women enrollment ratio (RAPMP) and the female Labor Force Participation (TPAKP), in the first lag have a positive relationship and significantly influence the Infant Mortality Rate (IMR) at significant level of 1%, 5% and 10% with coefficient value for Women enrollment ratio (RAPMP) is 16.91133 and coefficient value for Women Labor Participation Rate (TPAKP) is 11.94221. This means that if an increase in Women enrollment ratio (RAPMP) 1%, will cause an increase in Infant Mortality Rate (IMR) in the long term of 16.91133%. Meanwhile, if an increase in Female Labor Force Participation Rate (TPAKP) 1%, would cause an increase infant mortality rate (IMR) in the long term of 11.94221%.

In the long term, Labor Force Participation of Women (TPAKP) and the Women Enrollment ratio (RAPMP) has a positive and significant relationship to the Infant Mortality Rate (IMR), it is the opposite with the results in the can in the short term is negative and significant. In other words, the higher the education of women and the better women's work, the infant mortality rate is increasing. This may happen in the long term, due to changes in the environment, the demands of the times and social shift that has changed the mindset of women. Women in the future will be more concerned with higher education and also a good career, so they forget their productive age. In other words, they will delay to get married and have children. When women get married and have children over the age of productive, it will be very risky to give birth, and this will lead to infant mortality. Education can affect a woman to delay the age of her marriage. The longer a woman to attend classes, then theoretically the higher the age of first married. A woman who graduated from her junior high school level means she is at least married at the age of 16 years and above, when married in advanced high level means at least 19 years of age and later if married after attending college means at least aged over 22 years (Hartono, in Utina, et al, 2014).

There is still a lot of marriage, pregnancy and childbirth beyond the healthy reproductive period, especially at a young age. Women aged 15 years or younger are at increased risk of pre eclampsia (a type of high blood pressure that develops during pregnancy). Women 35 years or older are at increased risk for problems such as high blood pressure, diabetes during pregnancy and complications during labor (Mulidah et al., 2003).

From the results of research on the Analysis of Socio-Economic Factors Affecting Infant Mortality Rate in Indonesia, the authors can provide some policy recommendations related to the target of SDGs in reducing Infant Mortality Rate in Indonesia. Here are some policy recommendations that can be done:

1. This study found that there is a negative and significant relationship between GDP per capita to IMR. The government's policy in relation to increasing GDP per capita to reduce IMR in Indonesia in the short term is by increasing labor productivity, encouraging the development of processing or manufacturing industries. In other words, the existing labor in the primary sector such as agriculture or mining should start to be reduced. Of course, this policy also applies for the long term, because GDP per capita negatively and significantly affect the IMR.

2. In this study found a positive and significant relationship between the population with the IMR in the short term, while in the long term the influence of population and IMR is negative and significant. Therefore, the government needs to reinforce the family planning program to control birth is one of the factors that contribute to the reduction of MMR and IMR. With a large population and a rapidly growing population, Indonesia must revitalize family planning programs in relation to improving the quality of pregnancy and reducing mortality.
3. In this study found a negative and significant relationship between RAPMP with IMR in the short term. Therefore policies that can be associated with the development of Women's Empowerment useful to support and accelerate the achievement of quality of life and equality between men and women, implemented through dissemination / advocacy of education and training for women who are engaged in the whole field or sector.
4. In this study found a negative and significant relationship between TPAKP and IMR in the short term. Therefore, the policies that can be done related to improving the quality of Human Resources of Women in various sector and sub-sector activities and institutions and non-institutions that prioritize the improvement of skills and professionalism / expertise of women.
5. Related to long-term relationship, where in this study found that there is a positive and significant relationship between RAPMP and IMR, as well as the relationship between TPAKP and IMR. Policies that governments and relevant stakeholders are, by reviewing and considering the requirements are quite imposing women in a career, such as restrictions on age, education, and marital status. Because these things can change the way women in determining career.

CONCLUSION

Trend of Infant Mortality Rate during the study period (1955-2015) was negative (decreased). The decrease of AKB was 86 percent in the period of 1955-2015, with the percentage decrease from year to year faster. By 2015, Infant Mortality Rate is 22 per 1,000 live births.

In the short term GDP per capita (GDP) has a negative and significant effect on infant mortality rate (IMR) in the current period, only at significant level of 10%. Similarly, in the long term, income per capita (GDP) in the first lag is negatively and significantly affect the Infant Mortality Rate (IMR) on the significant level of 10%. In the short term, population growth variable (NUM_POP) has a positive and significant effect on Infant Mortality Rate (IMR) in the current period at significant level of 1%, 5% and 10%. However, in the long term, Population Growth (NUM_POP) has a negative relationship and has a significant effect on Infant Mortality Rate (IMR) at significant level of 1%, 5%, and 10%.

In the short term, the Women enrollment ratio (RAPMP), statistically has a negative effect on Infant Mortality Rate (IMR) in the current period at significant level of 1%, 5% and 10%. However, in the long term, the Women enrollment ratio (RAPMP) in the first lag has a positive relationship and significantly influence the Infant Mortality Rate (IMR) at significant level of 1%, 5% and 10%. In the short term, the female labor force participation rate (TPAKP), statistically has a negative effect on infant mortality rate (IMR) in the current period at significant level of 1%, 5% and 10%. However, in the long term, the female labor force participation rate (TPAKP) has a positive relationship and has significant effect on infant mortality rate (IMR) at significant level of 1%, 5% and 10%.

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