IOSR Journal of Nursing and Health Science (IOSR-JNHS)
e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 9, Issue 3 Ser. II (May - June 2020), PP 01-12
www.iosrjournals.org

Socio-Economic and Geographical Differentials of Neonatal Mortality in Indonesia: Based on the 2015 Inter-censal Population Survey and the 2014 Village Potential Statistics

Teti Tejayanti[1], Budi Utomo[2], Teguh Y, Wicaksono[3],
Meiwita Budiharsana[4], Maria Gayatri[5]

[1] *National Institution of Health Research and Development, Ministry of Health, Indonesia.*
[2] *Faculty of Public Health, University of Indonesia, Indonesia*
[3] *Health Policy Plus, USAID for Indonesia, Indonesia*
[4] *Faculty of Public Health, University of Indonesia, Indonesia*
[5] *National Population and Family Planning Board, Indonesia*

Abstract:
Background*: Neonatal mortality rate (NMR) in Indonesia is still high compared to neighboring countries, but more important is to know which socio-economic and geographical factors are associated with high NMR in certain regions. The aim of this study is to unravel the socio-economic and geographical differences in five regions of Indonesia, to be used by health policy makers to develop policies and budgets that meet specific needs in related to NMR in each region.*
Materials and Methods*: Source of data was the 2015 Intercensal Population Survey (SUPAS) and the 2014 Village Potential Statistics. The study population were women of reproductive age (15-49 years) living in the 40,750 census blocks of the 2015 SUPAS. Information of all neonatal deaths (singleton live born) that occurred between 2010-2015 were collected. Unit analysis was census block, each census block consisted of 16 households. Data analysis used natural logarithmic and multivariate regression.*
Results*: Results show that neonatal mortality in rural areas was almost twice to urban areas. Independent variables representing maternal factors that are significantly correlated with neonatal deaths are: women's age (<20 years and >35 years), parity (more than three children), low education (less than secondary high school), average distance to a local hospital, living areas have small numbers of hospital and many traditional birth attendants. Use of contraceptives, delivery attended by trained health workers, and living in urban area of Java-Bali are variables significantly associated with reduction of neonatal deaths.The risk of neonatal deaths in East Indonesia (East Nusa Tenggara, West Nusa Tenggara, Maluku and Papua) is twice of provinces in Java-Bali.*
Conclusion:*In conclusion, socio-economic and geo[1]graphic differentials do contribute to high neonatal deaths in Indonesia.*
Key Word: *neonatal mortality, social determinants, inequity*

Date of Submission: 29-04-2020 Date of Acceptance: 13-05-2020

I. Introduction

World Health Organization (WHO) in 2006 reported 7,000 neonatal deaths occurred daily, during the first 28 days of life or neonatal period (1). In recent years, neonatal mortality has declined rapidly in other countries, but not declining as fast in Indonesia and even show an increasing trend (54%) in some regions. (2)(3)(4) Efforts to reduce neonatal mortality became a priority for Government of Indonesia (GoI). (5)

One third of population in Indonesia was children. This group will be the next generation who determine the nation's future. Therefore, health development should be focused on the children. (6) At present, neonatal mortality rate in Indonesia was till high (14 per 1,000 livebirths) compared to neighboring with similar economic level such as Thailand (7 per 1,000 livebirths) and Malaysia (4 per 1,000 live births). (7) Neonatal declined was stagnant and tend to increase in the last decade. (3) In contrast, the coverage of health service program increased each year. Delivery by health workers had reached 89%. (6) The problem of neonatal mortality is still high even though the coverage of service programs is increasing every year, inviting big questions: Why have health programs, especially maternal and neonatal health programs not yet effectively impacted on improvingneonatal health status ? This required an explanation of why child health services program had not been effective in reducing neonatal mortality. Review shows 70% of neonatal deaths can be

reduced through evidence-based interventions. (8) The analysis of determinants of neonatal mortality was still rare in Indonesia. Therefore, this research was important.

Indonesia had unique characteristics. Demographically, Indonesia had 17,000 islands and administratively had 34 provinces, 4,918 municipality, and 70,460 villages. (9) There were a diversity in cultures. (10) The majority of population lived in rural areas and believed their ancestral tradition. Data on economic status showed that more than 65 million population lived slightly above the poverty level and were vulnerable of being poor. (11) There were 14% children lived with their family in poverty line. (6) Evidence had shown that there was a significant difference in socio economic and health status in developing countries including Indonesia.

Disparity among the poor and reach caused reducing in maternal, baby and under-five health status, including the developed countries such as the United States. (4) Based on those geographical and socio-economic background, this research aimed to obtain the factors (difference in geographical and socio-economic) in explaining maternal mortality rate in Indonesia. This study used data form 2015 Intercensal Population Survey and 2014 Village Potential Statistics. The information about neonatal mortality, geographic and social economic were taken from the 2015 Intercensal Population Survey. While data on facilities and infrastructure in each village were taken from 2014 Village Potential Statistics. This study was different from previous study including the coverage areas, analytical methods and explanatory variables. (12) This study will be useful to develop strategies and interventions to reduce disparity and increase child health status.

II. Material and Methods

Data sources: Data were taken from 2015 Intercensal Population Survey (SUPAS) and 2014 Village Potential Statistics (PODES). Both data sources were merged. SUPAS data were nationally representative samples that produced fertility and mortality indicators such as crude death rate, maternal mortality, infant mortality and under-five mortality. Total samples in this study were 40,750 census block which each block consist of 16 household. Total household were 652,000. (13)

Data taken form SUPAS were divided into 2 stata: household strata with cases of deaths and household strata with no case of death. Representative population was maintained by take some and take all (Glaser 1962):

1. Population if there were death cases: take all if there were 1-8 households and take some if there were more than 8 households, sample size was mentioned as n1.
2. Population with no death: take some with sample size was n2= n – n1, which n was 16 households. (13)

Data taken form PODES were used to describe barrier factors in accessing health services. The Central Burau of Statistics (BPS) conducted PODES to collect information on village's facilities and infrastructures as well as economic, social, cultural and other condition.(14)

Population: The study population were women of reproductive age (15-49 years) in the census block. Birth and death histories between 2010 and 2015 were obtained in the study population. Adequacy of sample size (maternal mortality) based on maternal deaths during pregnancy, delivery and postpartum at the 2010 census, thus the result would be accurate at regional and national levels.

Conceptual framework: This study was adopted Social determinant of health theory (16) and theory of change (17) to examine determinants of neonatal mortality.

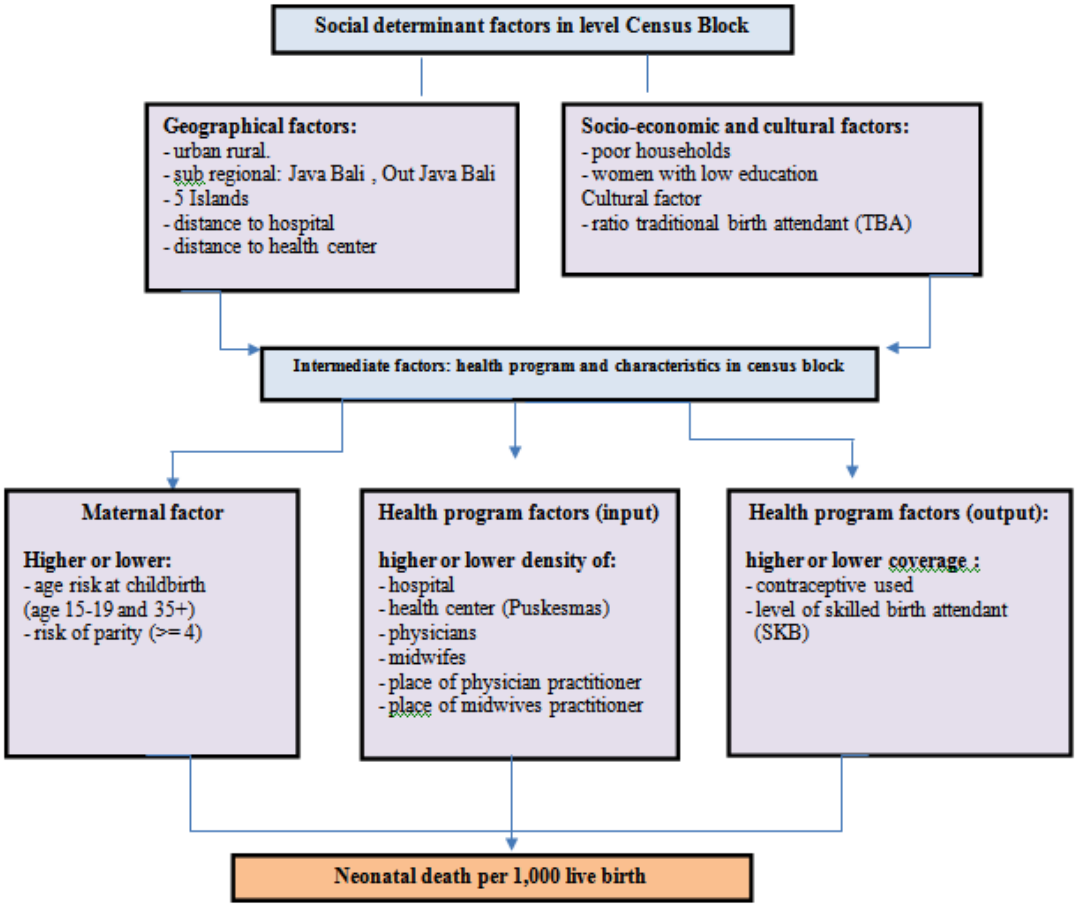

Figure 1
Conceptual framework for factor influencing neonatal mortality

Figure 1 described neonatal mortality factors taken from SUPAS 2015 and PODES 2014. This study hypothezed geographical and socio-economic condition influenced health program to reduce maternal mortality.

Study variables: The outcome used in this study was neonatal mortality. Predictor variables consist of input and output of health program. Covariates in this study were geographical and socio-economic factors.

Table 1. Operational definition

Variables	Definition	Source S/P
Outcome: Neonatal mortality	Infant death that occurred among babies in the first 28 days of life or neonatal period between 2010 and 2015 per 1,000 birth. Only single births	S
Covariates Geographic		
- place of residence	Categorized as rural and urban	S
- Java-Bali or Out Java Bali	Census block in Java-Bali or Out Java Bali	S
ExplanatoryGeographic		
- 5 big islands	Sumatera, Java-Bali, Kalimantan, Sulawesi, Others (West Nusa Tenggara, East Nusa Tenggara, Maluku and Papua)	
- mean distance to hospital	Mean distance from census block to hospital	P
- Mean distance to health center	Mean distance from census block to health center	P
Explanatory	**Socio-economic and cultural**	
- High or low of proportion of poor household	Proportion of poor households in the census block. Variable was categorized as low and high. The cut point was median of first and second quintile.	S
- High or low of proportion	Proportion of low educated women (women with no education or not graduate from	S

of low educated women	Junior High School). Variable was categorized as low and high. The cut point was median of distribution of low educated women	
- High or low of ratio of traditional birth attendant	Ratio of Traditional Birth Attendant per 1,000 population. Variable was categorized as low and high with cut of point was the median of ratio distribution of Traditional Birth Attendant	P
Characteristics of reproductive age women		
- High or low of Women in high risk age	Age risk was the number of women aged 15-19 years and >35 years per reproductive age (15-49 years) women in census block. Variable was categorized as low and high with cut of point was the median of distribution of high-risk women based on their age	S
- High or low of risk of parity	Proportion of reproductive age women who have more than 3 children per reproductive age women in the census block. Variable was categorized as low and high with cut of point was the median.	S
Health services		
- High or low of skill birth attendant	Proportion of deliveries by skilled health providers (doctors or midwives) reached 100% per 1,000 population. Variable was categorized as low and high with cut of point was the median of deliveries by doctors or midwives.	
- High or low of hospital density	Total number of hospitals per 1,000 population. Variable was categorized as low and high with cut of point was the median of distance mean distribution to hospitals.	P
- High or low of health center density	Total number of health center per 1,000 population. Variable was categorized as low and high with cut of point was the median of distance mean distribution to health centers.	P
- High or low of private physician density	Number of doctor/specialists per 1,000 population	P
- High or low of private midwives density	Number of private midwives per 1,000 population	P
- total number of physician/specialists	Number of doctors/specialists who lived in villages per 1,000 population	P
- low or high midwife density	Number of midwives who lived in villages per 1,000 population	P

Statistical analysis: Based on the valid data obtained, we performed a descriptive analysis of both the independent and dependent variables of interest by using centralization and dispersion measures. The normality of the quantitative variables was verified using the Kolmogorov-Smirnov test. In order to reach normality, log transformation was used for the non-normal variables. Where variables did not follow a normal distribution, non-parametric tests were used. Once this was checked, a Pearson/Spearman correlation analysis was performed to ascertain the degree of the relation between MMR and the remaining variables.All hypothesis testing to determine differences, associations and relationships was deemed significant at $p< 0,10$ and $p < 0.05$, and $p <0,01$. Statistical data analyses were performed using the STATA version 14. The analysis used equalized block census level of socio-economic and health program factors on natural log of unadjusted measures of neonatal mortality.

III. Result

Population characteristics

The result shows about one third of women in Indonesia were high-risk group. The group was age-risk pregnant women, low educated women and poor women (first and second quintile). (figure2). The risks were maternal reproductive health factors and socio-economic factors that have impact on birth outcome. The risk factors should be managed in a good way in order to reduce neonatal mortality.

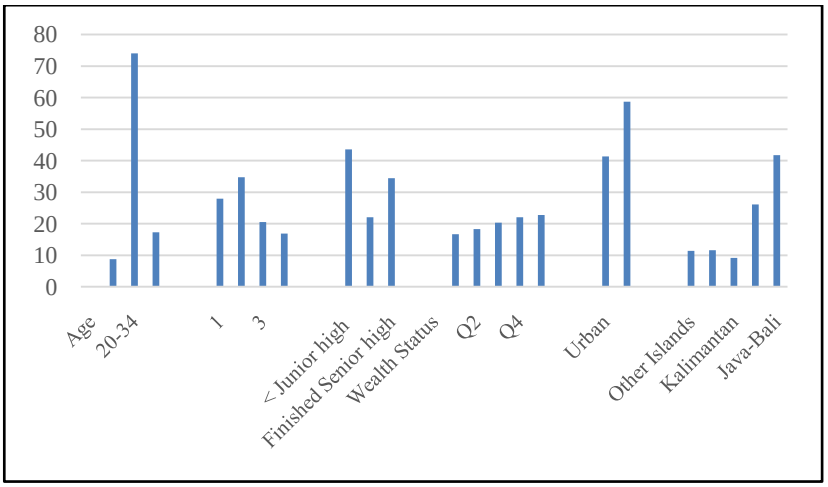

Figure 2. . Socio-demographic characteristics, women of reproductive age with births 2010-2015

Neonatal mortality geographical characteristics

Indonesia has some big islands: Sumatera, Java, Bali, Kalimantan, West Nusa Tenggara, East Nusa Tenggara, Sulawesi, Maluku and Papua. Those 9 islands were divided into 5 islands based on the number of populations. The highest number of neonatal mortality is in Java-Bali islands, perhaps since about 60% of Indonesian population lived in Java-Bali islands. (table 2) However, the highest neonatal mortality rate is among those who lived in East Indonesia region: West Nusa Tenggara, East Nusa Tenggara, Maluku and Papua. (Figure 3)

Table. 2 Neonatal mortality based on region and rural-urban 2010-2015

Groups	Number of Birth	Number of Neonatal Death
Urban rural		
Urban	89428	2780
Rural	136447	6219
Islands		
Sumatera	63603	2567
Jawa-Bali	78679	2292
Kalimantan	19909	756
Sulawesi	28517	1420
NTB-NTT-Maluku-Papua	35167	1964
Total	225875	8999

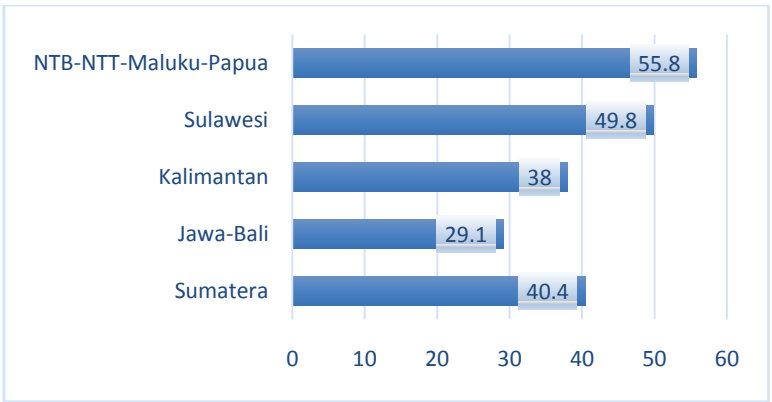

Figure 3. Unweighted Neonatal Death Proportion by Islands

Note: These numbers and statistics are unweighted, not for citation for NDR (neonatal death rate)
Source: analysis of Supas data

Another purpose of this study is to examine the difference of neonatal mortality based on socio-economic status and health services. The unit analysis is census block as community. Socio-economic was multi-dimensional underlying factor. In this study, differences in socio-economic factors contribute to maternal deaths. Community with high percentage of poor household have high neonatal deaths compared to community with high number of poor populations. Similarly, community with high percentage of low educated women high number of traditional birth attendant, low contraceptive used, low percentage of skilled birth attendant, low density of hospital, low density of doctors. (Table 3).

Table 3. Unweighted neonatal death measured by socio-economic, maternal risk and health program

Characteristics	Neonatal Deaths per 1000 live births*
Share of Women with high risk-age pregnancy	
Low	36.36
High	43.50
The proportion of women with lower education	
Low	31.66
High	46.83
The proportion of poor households	
Low	29.94
High	48.6
Share of Women with high risk-age pregnancy	
Low	36.36
High	43.5
Share of Women with high parity	
Low	30.04
High	47.52
The proportion of women using contraception	
Low	42.44
High	37.28
Births are 100% w SBA	
Low	52.81
High	32.49
Ratio hospital per 1000 pop in district	
Low	44.16
High	35.27
Ratio Puskesmas per 1000 pop in sub-districts	
Low	34.61
High	44.65
Ratio physician practice per 1000 pop in subdistricts	
Low	44.74
High	34.46
Ratio midwive practice per 1000 pop in subdistricts	
Low	43.50
High	35.53
Ratio number physician per 1000 pop in subdistricts	

Low	43.41
High	36.14
Ratio number midwives per 1000 pop in subdistricts	
Low	36.24
High	43.10
Ratio traditional birth attendant per 1000 pop in village	
Low	32.75
High	46.10
Total	39.84

Note :**Neonatal Deaths per 1000 live births** * (These numbers and statistics are unweighted, not for citation NMR).
source : analysis Supas 2015 data.

This study hypothezed differences in geographical and socio-economic factors influence neonatal mortality rate. Descriptive analysis shows the differences in neonatal mortality based on geographical difference (rural urban, islands). Correlation or simple regression is needed to examine the distance to health facility. The far the distance to hospitals causes improvement in neonatal mortality. The result shows the relationship between the distance to hospital and neonatal deaths. However, distance to Puskesmas have no correlation with maternal deaths. Even the distance to Puskesmas is near, but it is not correlate with low neonatal deaths. (Figure 4 & 5)

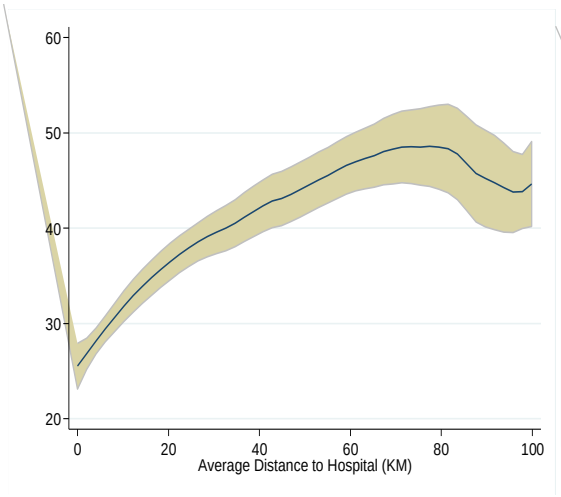

Figure 4. Neonatal death by average distance to hospital

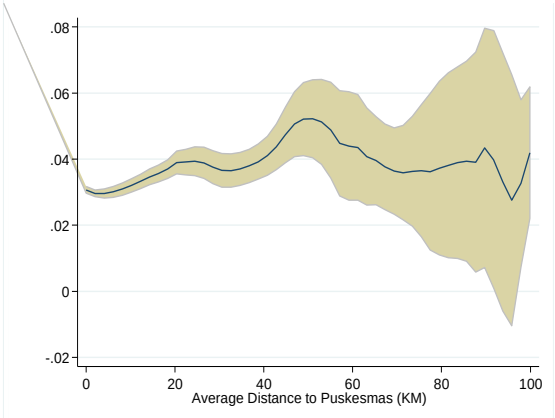

Figure 5. Neonatal death by average distance to Health Center (Puskesmas)

Despites demographic factors, this study also examine the roles of socio-economic differences in influencing neonatal mortality. This study proves the poorer households in the community, the higher neonatal deaths. (figure 6 and 7) This result shows socio-economic factors that cause improvement in neonatal deaths were poverty and low education.

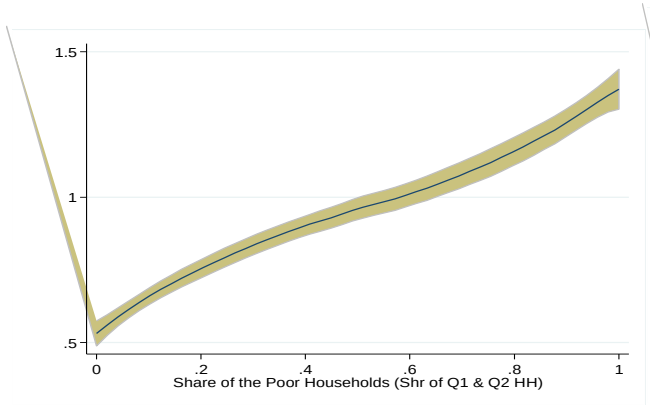

Figure 6. Neonatal death by poor household

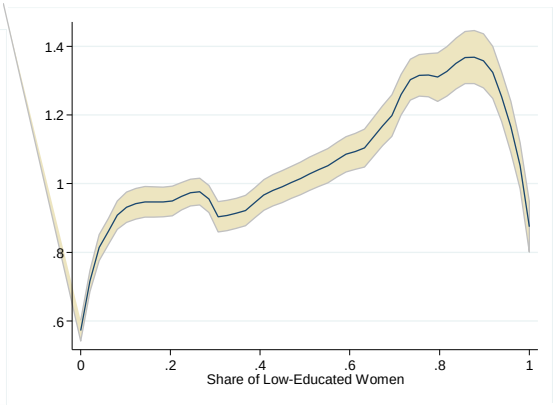

Figure 7. Neonatal death by poor household

In fatcs, death events are caused by multi related factors, not single factor. Multivariate analysis approach using regression analysis is used to obtain significant determinants of neonatal mortality. Rural-urban and Java-Bali are used as covariate to determine geographical roles in neonatal deaths.

The first multivariate model is without any difference in geographical factors, then second model is used geographical factors as covariates. There are differences after geographical factors used in the analysis. Factors of private midwive's practices, even though not significantly influencingneonatal deaths, but initially had a positive tendency to reduce neonatal deaths. However after controlled by urban factor and Java-Bali, private midwive's practices are not significantly influencing neonatal mortality.

Second differences, the initial analysis result without distinguishing urban and Java-Bali, shows that the longer distance to the hospitals , the higher neonatal deaths. In contrast, after controlled by urban and Java Bali, distance to hospital is not significant.

The urban role in neonatal mortality in this analysis is not significant but has a direction to reduce neonatal mortality. This might be due to less varying data between urban and rural. The role of Java and Bali in this analysis shows significant results that are likely to reduce neonatal mortality. In conclusion, geographical factors are determinants for neonatal deaths in Indonesia.

Health program services consist of a high proportion of skill birth attendants, contraceptive used, number of hospitals, distance to the hospital have probability to reduce neonatal mortality. High poverty, low education, age <20 and> 35 years old, have more than 3 children and the presence of traditional birth attendants are risk factors that significantly improved neonatal mortality. (Table 4).

Table 4. Determinants of Neonatal Death in Indonesia, 2010-2015

	Neonatal death per 1000 Birth	Neonatal death per 1000 Birth w. Location
High share of risk age women	0.00278***	0.00300***
	(0.000826)	(0.000828)
High share of women with high parity	0.00884***	0.00781***
	(0.000874)	(0.000903)
High share of low-educated women	0.00353***	0.00398***
	(0.000930)	(0.000940)
High share of poor household	0.00432***	0.00287***
	(0.00104)	(0.00110)
High share of women using KB	-0.00367***	-0.00304***
	(0.000838)	(0.000852)

High share of hospital per 1000 pop at dist.	-0.00159*	-0.00150*
	(0.000889)	(0.000894)
High share of puskesmas per 1000 pop at sub-dist.	0.00379***	0.00217**
	(0.000890)	(0.000942)
High share of physician practice per 1000 pop at sub-dist.	-0.000333	-0.000293
	(0.000943)	(0.000990)
High share of midwive practice per 1000 pop at sub-dist	-0.000296	0.0000353
	(0.000860)	(0.000865)
High share of # of trad.birth attendant per 1000 pop at village	0.00246***	0.00218**
	(0.000912)	(0.000927)
High share of SBA	-0.00860***	-0.00843***
	(0.00108)	(0.00107)
average distance to hospital	0.0000350*	0.0000101
	(0.0000181)	(0.0000187)
average distance to health center	-0.00000928	-0.0000231
	(0.0000449)	(0.0000451)
Urban		-0.00130
		(0.00111)
Jawa-Bali		-0.00575***
		(0.00101)
Constant	0.0271***	0.0319***
	(0.00164)	(0.00197)
Observations	40055	40055
Adjusted R-squared	0.018	0.018

Standard errors in parentheses

* = p<0.10

** = p<0.05

***= p<0.01

IV. Discussion

The three main causes of neonatal death are complications from preterm, asphyxia and infection. 75% of deaths of newborns occur in the first week, and 1 million occur in the first 24 hours from birth. (2), (18) Preterm babies are at risk of low birth weight, and small baby size according to gestation, both are risks that cause almost 80% of neonatal deaths. (18) This means that to reduce neonatal mortality, there are two strategies, first is to prevent risk factors, especially preterm and the second strategy is to overcome complications in the birth process.

The first strategy is to reduce the risk of preterm babies needing understanding, that preterm is a fairly complex problem, because it involves biological, psychological and social problems that are interrelated. The preterm impact is death, disability and social and economic costs for the nation. Nevertheless, the preterm problem is not understood by the general public or from the research side. (19) This study raises evidence of geographic and socioeconomic factors that contribute to neonatal mortality. This study proves that there are significant differences in geographic and socio-economic factors towards the level of neonatal mortality. Another supportive study is research in China, which proves that there is a relationship between social economic factors, low education associated with preterm cases.(20), (21).

Socio-economic factors are indirect factors in the occurrence of neonatal deaths, especially preterm. The mechanism can be explained as follows: mothers with poor social status, do not have the ability to buy or consume foods that meet nutritional standards. Maternal weight gain during pregnancy becomes inadequate, anemia easily occurs, lack of resistance to disease, so it is easily infected. Infection will trigger the baby to be born preterm. Similarly, the education factor is part of social status. The mechanism that occurs is that mothers who are less educated, tend to not have good knowledge about the disease, consequently lack of hygiene, and are prone to infection. Infection during pregnancy can result in babies born preterm. Preterm risk, babies born with low body weight and easy to experience hypothermia. Hypothermia results in asphyxia in newborns, which can lead to death if not treated properly.(19), (22), (23).

Indirect risk factors other than socio-economic causes of preterm are maternal biological factors. The results of this study show evidence that maternal factors such as age and risky parity show significant results for the increase in neonatal mortality. Another supportive study, cohort studies in America from 1998-2000 found evidence of age at <19 and> 35 at risk for preterm improvement, as well as other studies. (19), (24), (25). Strategies to reduce age risk factors during childbirth using contraception. The results of this study prove that high contraceptive use in the community / census blocs significantly reduced neonatal mortality. Other literature that supports the use of contraception can reduce infant mortality by Bongaarts(26),(27),(28) the benefits of contraceptive use in addition to reducing neonatal mortality also have an impact on the welfare of the country, which in turn also has an impact on reducing maternal and neonatal deaths at once.(29)

The second strategy reduces mortality through adequate management of birth / birth / labor. Competency of emergency facilities and medical personnel is important in overcoming complications from birth. Competency information is not available in this study. The proxy is carried out through hospital density and distance to the hospital. The results of this study indicate that hospital density and distance to hospital are significant factors in reducing neonatal mortality, but this is not the case with the puskesmas density. The possibility is that puskesmas in Indonesia are not designed as facilities that address the complications of newborns. Babies born with complications must be referred. Nonetheless the efforts of neonatal emergencies continue to be a protective procedure in the Puskesmas. In addition to medical personnel, the community also needs to be introduced to newborn care like the Kangaroo method, although it is simple, but can overcome hypothermia which can be fatal. (30) The analysis also found that the midwife density but not midwife practice was not associated with risk of neonatal death. These findings suggest the need for strengthening referral system and improving the midwife clinical competency.

The results of this study have proven factors that risk increasing neonatal mortality. This finding also proves that neonatal death risk factors and program service factors are still controlled by geographic and socio-economic factors. Although health facilities or hospitals have facilities and personnel who are competent in handling emergency cases of complications, but if there is a delay that causes a very severe condition of the baby / terminal stage upon arrival at the hospital, then the technology will be very difficult to prevent death or disability. The possible causes of delay is first aid to traditional birth attendant. (31) Fact that the present of TBAs is associated with higher risk of neonatal death per birth suggests the need for gradually eliminating the midwifery role of TBAs and educating communities to seek modern maternal health care. The best efforts to improve public health are promotive and preventive, especially to risk group.

Communities in Java Bali have access to better health services because of geographic factors, it is easier to reach health facilities and hospital densities and medical personnel that are higher than areas outside Java Bali. There is a disparity in mortality rates between Java Bali and outside Java Bali. This indicates that there should be a gap indicator of achieving targets between Java Bali and outside Java Bali. If this is not monitored, it will be difficult to assess the progress and effectiveness of the program being implemented.

The results of this study indicate that there are still gaps in program services that occur at the level of neonatal mortality. Program service factors are also controlled by geographic and socio-economic factors. The same thing happened to countries at the global level. poverty factor is a very strong factor increasing risk factors. (31) This indicates that the service program cannot be generalized between poor and rich communities. In communities with poor and poorly educated socio-economic levels, especially having risky maternal factors, more promotive and preventive interventions are needed, than the rich, and this becomes logical and fair,

because the rich group themselves have the ability to access health services. If the gap is not overcome, then the reduction in death will be hampered and it can even get worse. (4)

Some developing countries have succeeded in reducing neonatal deaths by innovating, given that changing economic status is not easy in a short time. In Thailand, the role of the kingdom is important in determining policy. The royal prince was trained in public health, so the policies issued were in accordance with conditions in Thailand. Nursing education showed inadequate results under the Ministry of Education, a breakthrough was made by establishing a school organized by the Ministry of Health. Forming supervisors in the countryside, established rural doctors, etc. In Ethiopia, the District Government was given knowledge about how to deal with the disease in general. In Bangladesh, access to facilities makes maximum use of electronic media. In Kyrgyzstan, do strengthening in primary facilities, etc. (32) In conclusion, program innovations to address demographic and socio-economic problems have become important efforts in reducing neonatal mortality in Indonesia.

V. Conclusion

There are differences level of neonatal death according to geography (urban and rural, Java Bali and Out Java Bali, between the Sumatra islands, Java Bali, Kalimantan, Sulawesi, and others (NTB, NTT, Maluku and Papua). Health program services are still controlled by geographic factors and socio-economic. Factors that increase the risk of neonatal mortality are maternal, age (<20 and> 35 years), parity (> 3 children) and low education (<junior high school), far from the hospital, living in the hospital area are few and there are many traditional birth attendants. The factors that reduce neonatal mortality are contraceptive use and delivery by health workers. A better referral system is needed. Improve public health are promotive and preventive. Public health interventions directed at reducing neonatal death should address community, especially to risk group

Ethical approval

This research obtained permission from the Health Research and Development Agency, Ministry of Health of the Republic of Indonesia and obtained ethical approval from the University of Indonesia for the use of secondary data used.

Acknowledgments

Thank you to the Health Research and Development Agency, Ministry of Health of the Republic of Indonesia, Professor EndangAchadi, AgusSuprapto, Tin Afifah and Anwar Musadad who have provided facilitation and direction to this research.

References

[1]. Goals MD. Media centre Children : reducing mortality. 2015;(October):11–3.
[2]. Africa S. Newborns : reducing mortality Key facts. 2018;(September).
[3]. Hodge A, Firth S, Marthias T, Jimenez-Soto E. Location matters: Trends in inequalities in child mortality in Indonesia. Evidence from repeated cross-sectional surveys. PLoS One. 2014;9(7).
[4]. Children S the. The Urban Disadvantage. 2015.
[5]. High-level DATTHE. SUSTAINABLE DEVELOPMENT GOAL 7 WILL BE REVIEWED IN- DEPTH AT THE HIGH-LEVEL A new global agenda for a. Sustain Dev Goal 7. 2018;1–3.
[6]. Kementerian Perencanaan Pembangunan Nasional, UNICEF. Laporan Baseline SDG tentang Anak-Anak di Indonesia. Kementeri Perenc Pembang Nas dan United Nations Child Fund [Internet]. 2017;1–105. Available from: https://www.unicef.org/indonesia/id/SDG_Baseline_report.pdf
[7]. You D, Hug L, Ejdemyr S, Beise J, Idele P, Gerland P, et al. Mortality. 2015;
[8]. Gary L Darmstadt, Zulfiqar A Bhutta, Simon Cousens, Taghreed Adam, Neff Walker, Luc de Bernis for the LNSST. Neonatal Survival 2 Evidence-based , cost-effective interventions : how many newborn babies can we save ? 2005;(panel 1):19–30. Available from: https://www.ncbi.nlm.nih.gov/pubmed/15767001
[9]. Survey H, Findings K. Indonesia 2002-2003. 2003;
[10]. Ananta A, Nurvidya Arifin E, Sairi Hasbullah M. Demography of Indonesia's Ethnicity. 2015; Available from: http://www.degruyter.com/view/books/9789814519885/9789814519885/9789814519885.xml
[11]. Bank W. Pengentasan Kemiskinan di Indonesia. World Bank [Internet]. 2014; Available from: www.world bank.org
[12]. Titaley CR, Dibley MJ, Agho K, Roberts CL, Hall J. Determinants of neonatal mortality in Indonesia. BMC Public Health [Internet]. 2008;8(1):232. Available from: http://www.biomedcentral.com/1471-2458/8/232
[13]. BPS. Survei Penduduk Antar Sensus (Supas) 2015. 2015;2015. Available from: https://bps.go.id/website/pdf_publikasi/Penduduk-Indonesia-hasil-SUPAS-2015_rev.pdf
[14]. Statistics Indonesia. Statistik Potensi Desa. 2008. 288 p.
[15]. Solar O, Irwin A. A Conceptual Framework for Action on the Social Determinants of Health. Soc Determ Heal Discuss Pap 2 (Policy Pract [Internet]. 2010;79. Available from: http://apps.who.int/iris/bitstream/10665/44489/1/9789241500852_eng.pdf?ua=1&ua=1
[16]. Understanding the determinants of child survival in developing countries: the Mosley-Chen conceptual framework. 1984;8.
[17]. Vogel I. What is Theory of Change? 2012;
[18]. Read M. Every Newborn : progress , priorities , and potential beyond survival Popular Articles. 2014;2014–6.
[19]. Behrman RE, Stith Butler A. Committee on Understanding Premature Birth and Assuring Healthy Outcomes Board on Health Sciences Policy P R ETE R M B I RTH Library of Congress Cataloging-in-Publication Data [Internet]. Preterm Birth: Causes, Consequences, and Prevention. 2007. Available from: http://www.nap.edu/catalog/11622.html

[20]. Zhao X, Chen Y, Qiu G, Xiao M, Zhong N. Reducing preterm births in China. Lancet. 2012;380(9848):1144–5.
[21]. Meng G, Thompson ME, Hall GB. Pathways of neighbourhood-level socio-economic determinants of adverse birth outcomes. Int J Health Geogr. 2013;12.
[22]. Almeida MFB de, Kawakami MD, Moreira LMO, Santos RMV dos, Anchieta LM, Guinsburg R. Early neonatal deaths associated with perinatal asphyxia in infants ≥2500 g in Brazil. J Pediatr (Versão em Port [Internet]. 2017;93(6):576–84. Available from: http://linkinghub.elsevier.com/retrieve/pii/S2255553617300320
[23]. Silveira RC, Procianoy RS. Hipotermia terapêutica para recém-nascidos com encefalopatia hipóxico isquêmica. J Pediatr (Rio J) [Internet]. 2015;91(6):S78–83. Available from: http://dx.doi.org/10.1016/j.jped.2015.07.004
[24]. Rondot P, Bathien N. Mouvements Anormaux Induits Par Les Medicaments Psychotropes. Encephale. 1979;5(1):41–8.
[25]. Tararbit K, Lelong N, Goffinet F, Khoshnood B. Assessing the risk of preterm birth for newborns with congenital heart defects conceived following infertility treatments: a population-based study. Open Hear [Internet]. 2018;5(2):e000836. Available from: http://openheart.bmj.com/lookup/doi/10.1136/openhrt-2018-000836
[26]. Bongaarts J. Does Family Planning Reduce Infant Mortality Rates? Popul Dev Rev [Internet]. 1987;13(2):323–34. Available from: http://www.jstor.org/stable/1973197%5Cnhttp://www.jstor.org/stable/pdfplus/1973197.pdf?acceptTC=true
[27]. Chola L, McGee S, Tugendhaft A, Buchmann E, Hofman K. Scaling Up Family Planning to Reduce Maternal and Child Mortality: The Potential Costs and Benefits of Modern Contraceptive Use in South Africa. PLoS One [Internet]. 2015;10(6):e0130077. Available from: http://www.ncbi.nlm.nih.gov/pubmed/26076482%0Ahttp://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=PMC4468244
[28]. Utomo B et al. Family Planning Contribution to Reducing Maternal Deaths, Indonesia 1970-2015: Decomposition Analysis (unpbulish 2018).
[29]. Petruney T, Wilson LC, Stanback J, Cates W. Family planning and the post-2015 development agenda. Bull World Health Organ [Internet]. 2014;92(8):548–548A. Available from: http://www.who.int/entity/bulletin/volumes/92/8/14-142893.pdf%0Ahttp://www.ncbi.nlm.nih.gov/pubmed/25177066%0Ahttp://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=PMC4147409
[30]. Ludington-Hoe SM. Kangaroo care as a neonatal therapy. Newborn Infant Nurs Rev. 2013;13(2):73–5.
[31]. Titaley CR, Dibley MJ, Roberts CL. Type of delivery attendant, place of delivery and risk of early neonatal mortality: Analyses of the 1994-2007 Indonesia Demographic and Health Surveys. Vol. 27, Health Policy and Planning. 2012. p. 405–16.
[32]. Balabanova D, Mills A, Conteh L, Akkazieva B, Banteyerga H, Dash U, et al. Good health at low cost 25 years on: Lessons for the future of health systems strengthening. Lancet [Internet]. 2013;381(9883):2118–33. Available from: http://dx.doi.org/10.1016/S0140-6736(12)62000-5

Teti Tejayanti, et. al. "Socio-Economic and Geographical Differentials of Neonatal Mortality in Indonesia: Based on the 2015 Inter-censal Population Survey and the 2014 Village Potential Statistics." *IOSR Journal of Nursing and Health Science (IOSR-JNHS)*, 9(3), 2020, pp. 01-12.