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Letter from the Editor-in-Chief

Myanmar and Korea have many similarities and are complementary relationship. Therefore, we believe that research exchange will expand mutual understanding between Myanmar and Korea, and will be the cornerstone for mutual development.

KOMYRA and YUE have co-published The Myanmar Journal since August 2014. So far, many scholars have published numerous papers through the journal, and We are sure that this journal has helped many people understand Myanmar and Korea more clearly and closely.

The Myanmar Journal covers various issues in Myanmar and Korea. It covers various topics that can promote bilateral development and mutual understanding, not limited to specific topics such as economy, industry, society, education, welfare, culture, energy, engineering, healthcare, and agriculture.

We hope that this journal will continue to promote understanding of the current status and potential capabilities of Myanmar and South Korea and promote in-depth international exchange and cooperation.

We would like to express our deepest gratitude to the editorial board and YUE and KOMYRA for their valuable support in The Myanmar Journal publication.

February 28, 2022

Youngjun Choi *yj choi*

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The Myanmar Journal (ISSN 2383-6563) is the official international journal co-published by Yangon University of Economics (YUE) and Korea Myanmar Research Institute (KOMYRA).

This journal aims to promote the mutual cooperation and development of Myanmar and Korea through intensive researches in the entire field of society, economy, culture, and industry.

It will cover all general academic and industrial issues, and share ideas, problems and solution for development of Myanmar.

Articles for publication will be on-line released twice a year at the end of February and August every year on the Myanmar Journal webpage (http://www.komyra.com/bbs/board.php?bo_table=articles).

Analysis of Factors Influencing Child Mortality in Rural Area of Myanmar

Win Naing · Ei Thu Zar Htun***
Yangon University of Economics

ABSTRACT : Child mortality is one of the powerful indicators to determine health situation of a country. It is a composite indicator reflecting demographic, socio-economic, healthcare service and environmental situation in the developing countries like Myanmar. The main objective of this study is to determine the factors related to child mortality in rural area of Myanmar. This study used the data from the 2015-2016 Myanmar Demographic and Health Survey (MDHS). The results of the binary logistic regression model reveals that the mortality risks of Kayah and Rakhine States were lesser than those in Chin State. These regions have negative influences on child mortality and it is significantly associated with child mortality at 5 % level. The rich households are less likely to experience child mortality compare with poor households and wealth quintile is significantly associated with child mortality at 10 % level. Moreover, breastfeeding, child immunization and mother's antenatal care have significant effect on child mortality at 1% level. In term of environmental health, the use of toilet was 5% level significant influence on child mortality. It suggests that utilization of healthcare services such as delivery in health facilities and distance to health facilities are especially needed in rural area.

Key words : *under-five mortality, demographic, socio-economic, health care services, percentage distribution, and binary logistic regression model*

I. Introduction

Child mortality is the main indicator of child health and overall development of a nation, as well as it reflects the socio-economic, demographic, health service and environmental condition in which children live, including their healthcare and others

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in society. In every country, child mortality is applied as an indicator of the demographic and health level of people.

Child mortality means the mortality of children under- five year of age. Child mortality rate (CMR) is defined as the probability of a child born in a specific year, dying before reaching the age of five expressed as per 1000 live births (World Health Organization: WHO, 2019). It is also called as under-five mortality rate (U5MR). Worldwide, the total number of under-five mortality has decreased from 12.6 million in 1990 to 5.9 million in 2018. Globally, U5MR declined by 59%, from an estimated rate of 93 child deaths per 1000 live births in 1990 to 39 child deaths per 1000 live births in 2018. This is equivalent to 1 in 11 children dying before reaching age of five in 1990, compared to 1 in 26 children in 2018. In addition, it has the inequities in child mortality between high-income and low-income countries remain large. U5MR in low-income countries was 68 child deaths per 1000 live births – almost 14 times the average rate in high-income countries was 5 child deaths per 1000 live births in 2018 (WHO, 2019).

Diminishing these inequities across countries and saving more children's lives by ending preventable child mortality are the important priorities. With the end of the Millennium Development Goals (MDG), the international community agreed on a new framework- the Sustainable Development Goals (SDGs) where the target is to end preventable deaths of newborns and children under- five of age. The goal is for all countries aiming decline under-five mortality to at least as low as 25 child deaths per 1000 live births. 120 Member States already met the SDG target on under-five mortality, and 21 countries are predicted to meet the target by 2030, if current trends continue. U5MR of Myanmar decreased gradually from 177.7 child deaths 1000 live births in 1969 to 46.2 child deaths per 1000 live births in 2018 (WHO, 2019).

The 2015-2016 Myanmar Demographic and Health Survey (MDHS) reports that out of 4815 under-five children, a total of 218 children had died during the five years before the survey. In the MDHS survey, 21% of married women from urban area and 79% of married women from rural area were interviewed. Among the total live births of women, the percent of child mortality were 14.7% in urban and 85.3% in rural area. Likewise, the CMR was found approximately 33 children died at 1000 live births of urban and 49 children died at 1000 live births of rural. Therefore, CMR in rural areas was obviously higher than in urban areas.

Hence, child mortality becomes one of the most important issues in the developing countries including Myanmar. Since the healthcare services including higher coverage with immunization, safe delivery of birth are undeveloped in rural areas than urban areas of Myanmar, the under-five death may significantly have occurred due to these causes. Therefore, this study aims to explore the impacts of demographic, socio-economic, healthcare and environmental knowledge enrichment

factors on child mortality of rural area. The main objective of this study is to determine the factors associated with child mortality in rural area of Myanmar.

II. Literature Review

In this study, the related articles studied on factors associated with trends in infant and child mortality in developing countries.

Kiloni Judith Nafula (2009) studied factor influencing under-five mortality in urban and rural Kenya. It specifically sought to establish the effects of some socioeconomic, bio-demographic, socio-cultural and environmental factors on under-five mortality in urban and rural areas. The objective of this study was to examine the determinants of under-five mortality in urban and rural Kenya. The study utilized the 2003 Kenya Demographic and Health Survey (KDHS) data. The main study variables were; maternal level of education, wealth index, maternal occupation, maternal age at first birth, birth order, preceding birth interval, source of drinking water and type of toilet facility while the dependent variable was under-five mortality. This data has been used bivariate and multivariate analysis, mother education, birth interval and source of drinking water were significant associated with child mortality in both urban and rural area. The results of the bivariate analysis revealed significant associations between maternal education, marital status and under-five mortality in the urban areas while for the rural areas, maternal education, preceding birth interval and source of drinking water were statistically significant. However, occupation, wealth index, maternal age, birth order, religion and type of toilet were not statistically significant in this study in both the urban and rural areas. The results of the multivariate analysis revealed that maternal education and marital status were significantly associated with under-five mortality in the urban areas while preceding birth interval, source of drinking water and maternal education were significantly associated with under-five mortality in the rural areas. From the socio-economic factors, the hypothesis was that the higher the level of maternal education, the better the chances of under-five survival in the urban than in the rural areas. The length of preceding birth interval was highly significant as a factor in under-five mortality in the rural areas but not significant in the urban areas.

Manoj K. Pandey (2009) examined the effect of maternal health on the under-five mortality. Third wave of micro-level National Family Health Survey 2005-06 data for rural India is used. Using various alternative measures of maternal health, the paper finds strong association between maternal health and child mortality. In particular, the effects of maternal height, weight, presence of any disease and anemia are found

significant. It employs dichotomous variable of child mortality as dependent variable and classify explanatory variables into following categories: mother's characteristics, child characteristics, and household characteristics. Maternal characteristics apart from their health performance indicators include their age, education, and employment status. Child characteristics include sex, and birth order. The role of many mother's characteristics such as autonomy, employment status, education etc. in determining child mortality are well-researched. Based on various measures of mother's health and nutritional status, our analysis tried to analyze the effect of maternal health on the survival of under-five mortality. The paper also found positive and significant effect of mothers' age, media exposures, household size and facility of piped water on the child survival and confirmed that higher birth order increases the risk of under-five child mortality.

Dian Kristiani Irawaty¹, (2020) explained exploring the factors associated with infant mortality in rural Indonesia. 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. The study indicates evidence of disparities in the reasons for infant mortality among divergent socio-demographic subclasses. 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.

III. Data and Method

1. Data Source

This study is based on data from 2015-2016 MDHS, a nationally representative population-based survey implemented by the Ministry of Health and Sports. The total sample used in the study consisted of 12885 married women in the age of 15- 49 years. All women aged 15- 49, living permanently in the selected households or present in the household on the night before the survey visit, were suitable to be interviewed in the MDHS. This study applied the children's data file, which included individual data on a total of 4815 children under-five year of age of the total sample of woman interviewed. Of the 4815 women (1012 women in urban area and 3803 women in rural area) surveyed, the total numbers of births considered for this study were 3803 women with 186 child deaths occurring before the age of five years within the rural areas of Myanmar.

2. Dependent and Independent variables

The dependent variable in this study is child mortality. In the present study, the variables which are expected to have influences on child mortality are as given below:

Related Factors		Independent Variables
Demographic Factors		Sex of child, Age of mother at birth, Birth order, Size of child at birth, Children ever born, Family size and Region/States.
Socio- Factors	Economic	Mother's education level, Father's education level, Mother's working status, and Wealth index,
Healthcare Factors	Services	Place of delivery, Distance to health facilities Breastfeeding status, Child immunization, Antenatal care, Contraceptive use, Sources of drinking water, Types of toilet use, and Types of cooking fuel.

3. Method

The descriptive analysis is used the percent distribution of demographic, socio-economic and healthcare services variables of child mortality. The association between

the dependent and independent variables are checked using Chi-square test. The binary logistic regression model is applied to determine the factors influencing on child mortality in rural area of Myanmar.

The binary logistic regression model considers a qualitative variable as a function of several explanatory variables, both qualitative and quantitative. It is a form of regression which is used when the dependent variable is a dichotomy and the independent variables are categorical. In this analysis, child mortality is regarded as dependent variable and it is classified in the following way:

$$y_i = \begin{cases} 0, & \text{alive (if child mortality is not happened)} \\ 1, & \text{dead (if child mortality is happened)} \end{cases}$$

Demographic, socio- economic and related healthcare services variables are considered as independent variables (X_i) in this model.

IV. Results

In this section, the predictors of child mortality were examined according to demographic, socio-economic and related healthcare services of population concerned.

1. Analysis of Child Mortality According to Selected Variables

The mortality rate of the frequency distribution and Chi-square test for the association between child mortality and demographic, socio-economic, and related healthcare services characteristics are shown in the Appendix Table (1).

According to the Appendix Table (1), in studying child mortality of demographic variables, the mortality rate was approximately 54 male children and 43 female children of the total live births. Sex of child, it is slightly higher for male child death than for female child. Regarding mother' age at birth, child mortality rate is highest for the children whose mother's age at birth is 45 years and above, and lowest for the children whose mother's age at birth is aged 25 to 34. From birth order, size of child and children ever bon and family size play a vital role on child mortality. In this way, the highest child mortality rate of birth order were 64 children of 4 to 5 ranks and lowest for the first rank, size of child at birth was the highest children who do not know their weight at 73 children and the second highest child mortality was 53 children of small weight. Hence, the study found that children who lost weight normally were more likely to die. For children ever born, the highest mortality

rate occurs 53 child deaths of mother who have born five and above. For family size, the highest mortality rate was 62 children in three family members and the lowest was at 35 children in those with more eight family members at the total live births. Because of that families with one child are more likely to die, and it show that child mortality has been steadily declining as the number of family size increased. Among 15 states/regions, approximately 88 children of Chin region is the most common cause of death and 25 children of Sagaing region is the lowest child death at the total live births. The cross tabulation of participants with child death in demographic variables, child mortality was statistically significant associated at 10 % level with sex of child, 5 % level with mother's age at birth and 5% level with regions in rural area of Myanmar.

Dealing with Socio-economic variables, the education of mothers and fathers are great in raising their children. The result of child mortality rate indicates that 65 for the children of higher educated mothers and lowest 40 for the children whose mother's education level is secondary education. Accordingly, the highest child mortality was 54 of illiterate fathers and the lowest was 13 of higher education level. Consequently, father's education has a strong relation than mother's education with child mortality. Regarding mother's working status, the highest child mortality was 55 children of mothers whose were working during the conducted survey. Wealth index shows the most child mortality those 55 children of poor households, 50 children of middle household and 25 children of richer household. Among the total death of wealth index, the child mortality situation is found for the children with mother's low standard of living index. In socio- economic variables, child mortality was statistically significant associated at 5% level with wealth index. According to this study, the child mortality depends on the family's standard of living and wealth.

Concerning healthcare services factors, the save of children and maternal care were especially needed. The most of child mortality rate for this study were 77 children that mothers who don't pay currently breast feed to the child in breastfeeding status, 93 children that mothers who don't antenatal care, 62 children mothers who don't use any contraceptive, and 54 children of most parents said that travel to a facility was not a big problem with distance to health facilities. In the same way, the most of mortality rate occur 75 children that mothers who delivery of others medical sectors for place of delivery and 153 children of three to five times immunize for immunization of child. In environmental health status, the high of mortality rate were 61 child deaths of spring type for source of drinking water, 71 child deaths other types (others such as dry and bucket) of toilet use, 51 child deaths of wood use for types of cooking fuel, respectively. Studies on the most child mortality rate in health services were spring type of drinking water and wood uses of the types of cooking fuel. Looking for types of toilet use, the most child mortality

rate occurs that households which didn't use flush, pit and no facility types. For breastfeeding status, antenatal care, contraceptive use and child immunization status were found with 1 % level significant effect on child mortality and distance to health facilities and types of toilet use were found with 5 % level significant on the child mortality.

2. Analysis of Binary Logistic Regression Analysis on Child Mortality

The results of logistic regression analysis are shown in Appendix Table (2) in which it is analyzed that all the explanatory variables have significant effect on child mortality in cross-tabulation analysis. It presents an important role in child mortality though it does not show significant effect on child mortality.

The estimated binary logistic regression model is

$$\text{Logit (y)} = -2.759 - 1.231 (\text{Kayah region}) - 0.875 (\text{Rakhine region}) - 0.494 (\text{richer families}) - 1.736 (\text{breastfeed mother}) + 1.114 (\text{two time immune of child}) + 2.254 (\text{three to five times immune of child}) - 0.798 (\text{antenatal care mother}) + 0.969 (\text{pit toilet uses}) + 1.238 (\text{no facility toilet uses}) + 1.455 (\text{others or bucket toilet uses})$$

According to the Appendix Table (2), it presents the estimated coefficients (B), standard error (SE), Wald test, odds ratio (OR) and confidence interval (CI) for child mortality. In this table of the odds ratio significant variables are indicated by asterisk sign. Sex of child has insignificant influence on child mortality. Female children were 0.8 time (OR=0.803, 95% C.I= 0.58- 1.10) less likely to die compare to those in male. Child born to mother's age group 25- 34 years was less likely to die compare to mother's age group 15- 24. Similarly, age group 35-44 and 44 over of child born mothers were more likely to die compare to mother age group 15-24. Though mother's age is an important characteristic for child mortality but this variable has insignificant effect on child mortality. Among 15 states/regions, children born in Kayah was 0.7 time (OR= 0.742, 95% CI= 0.78-0 1.46) and Rakhine was 0.4 time (OR= 0.417, 95% CI= 0.19- 0.89) less likely to die compare to those in Chin. These two regions are negative influence on child mortality and 5 % level significant associated with child mortality and the rest of regions have not influence on child mortality.

Although mother's working status has not significant influence on child mortality, currently mother's working was more likely to die compare to not working mothers. With wealth index of this study, family economic rich status has 0.6 time (OR= 0.610, 95 % C.I =0.345-1.079) less likely to die compare with poor families and it is a negative influence on child mortality. Family economic rich of wealth index are 10 %

level significant with child mortality in wealth index.

Breastfeeding status has negative influence on child mortality. The risk of child mortality was approximately found 1.8 times (OR= 1.76, 95% C.I= 0.122- 0.254) less likely to die for the children whose mother's currently breastfeeding to their children as compared to the children whose mothers were not currently breastfeeding their children. Breastfeeding status of children has 1 % level significant influence on child mortality. ANC benefits both the pregnant mother and her unborn baby for maternal healthcare, and also assists in screening, diagnosing and managing or controlling the risk factors that might adversely affect the pregnant women. Child immunization of the study, child received two times immunize has 3.0 times (OR= 3.047, 95% C.I= 1.997- 4.647) and child received three to five time immunize has 9.2 times (OR= 9.250, 95% C.I= 5.542- 16.383) are more likely to die comparing with one time immunize. It has 1 % level significant influence on child mortality. For antenatal care (ANC), the risk of child mortality was found that approximately 0.5 time (OR= 0.450, 95 % C.I = 0.309-0.657) for the children whose mother have taken protected injection during the pregnancy as compared to the children whose mothers have not taken any protected injection during the pregnancy. Timing of antenatal care checkup has 1% level significant influence on child mortality. Moreover, mother's contraceptive use and distance to health facilities are insignificant influence with child mortality. With environmental health, types of toilet use have positive influence on child mortality. It show that pit toilet uses has 2.3 times (OR = 2.365, 95% C.I= 0.928- 7.478), no facility has 3.4 times (OR= 3.449, 95% C.I= 1.160- 10.257) and others such as dry and bucket has 4.2 times (OR= 4.283, 95% C.I= 1.352- 13.569) more likely to die compare with flush toilet uses. These results are 5% level of significance influence with child mortality.

V. Conclusion and Recommendation

This study investigates the predictors of child mortality. It utilized the nationally representative data from the MDHS 2015-2016. Descriptive statistics is applied to identify the important factors of child mortality. Likewise, Chi-Square test is used to test significant association between independent variables and dependent variables. Furthermore, binary logistic regression model has been applied to identify the important predictors of child mortality in rural of Myanmar. From these analyses several interesting observations can be interpreted the findings appear to be problematic in many cases.

Concerning with the descriptive statistics, higher child mortality occurred in Chin

state compare with other regions, the child death for male was more than that female, the prevalence of child death had father's poor education level was more than mother's education level, higher child mortality was found among working mother compared with non-working mother. The findings show that parent's education has been identified the most important socio-economic predictors of child mortality that means mortality rate decrease with increase in both mother and father education level but in Chi-Square test of their education has insignificant effect on child mortality. This test shows that sex of child, mother's age, Region/State, and mother's working status, wealth index, was significantly associated while birth order, size of child, and children ever born family size were not significant with child mortality in rural area. This study found a significant association between most of healthcare services factors and child mortality in rural area of Myanmar.

The result of binary logistic regression suggested the region of Kayah and Rakhine were statistically significant for the prediction of child mortality. The mother's standard of living index was found to have a significant variable for child mortality. Several healthcare services variables have a substantial effect on child mortality in rural area. Among these variables breastfeeding status, ANC and child immunization have significant effect on child mortality. In Myanmar, the government provides free immunizations to pregnant women and their unborn children. Furthermore, the risk of child mortality was found lowest for the children whose mother's received antenatal check during pregnancy. Even though some socio-economic and demographic factors of interest in the study indicated no significant with child mortality, it would be misleading to conclude that factors such as sex of child, mother's age, and wealth index have no significant effect on child survival.

This study suggests that merely encouraging parent to seek healthcare for their children is not sufficient. The odds of child mortality increase with growth in number of children, although most parents are less interest in using healthcare services as they have more children. The empirical evidence gave by this study contributes to the literature that supports the relationship between the use of healthcare services and the reduction of child mortality in Myanmar. It recommended that further investigation has to be done based on MDHS (2015-2016) in order to make the finding of this research stronger. The paper suggests that utilization of healthcare services such as delivery in health facilities and distance to health facilities are a complex issue. Thus, it requires further research with qualitative approaches that can increase our understanding of the impact of using healthcare service on child mortality among rural area of Myanmar.

Acknowledgements

We express deep and sincere gratitude to our teachers whose guidance, encouragement, suggestion and very constructive criticism have contributed immensely to the evolution of our ideas has the research process. We special thanks go to authors and publishers of different journals for open internet access to researchers without realized.

REFERENCES

- Anil Shetty, Shetty S. 2014. The correlation of health spending and infant mortality rate in Asian countries *Int J ContempPediatr.* 1(2):100-5.
- Ester PV, Torres A, Freire JM, Hernández V, Gil Á. 2011. Factors associated to infant mortality in Sub-Saharan Africa. *Journal of Public Health in Africa.* 2 (2):e27.
- Kilobi Judith Nafula. 2019. Factor Influencing Under-Five Mortality in Urban and Rural Kenya. Master of Art in Population Studies, University of Nairobi.
- Hossain, M. I. 2010. Inequality in the Utilization of Maternal Care and the Impact of a Macroeconomic Policy: Evidence from Bangladesh. Health, Econometrics and Data Group Working Papers 10/08, HEDG, Department of Economics, University of York.
- Madise NJ, Banda EM, Benaya KW. 2003. Infant mortality in Zambia: socioeconomic and demographic correlates. *Biodemography and Social Biology.* 50(1-2):148-66.
- Md. Jamal UDDIN, Md. Zakir HOSSAIN and Mohammad Ohid ULLAH. 2008. Child Mortality in a Developing Country: A Statistical Analysis. 4(3): 270-283.
- Mizanur Rahman, Moazzem Hossain, Mosharaf Hossain. 2013. Impact of Socio-Demographic Factors on Child Mortality in Bangladesh. *International Journal of Psychology and Behavioral Sciences.* 3 (1): 34-39
- Mutunga CJ, editor. 2004. Environmental determinants of child mortality in urban Kenya. Discussed in an informal workshop held at the Abdus Salam ICTP: Trieste, Italy.
- Mustafa HE, Odimegwu C. 2008. Socio-economic determinants of infant mortality in Kenya: analysis of Kenya DHS 2003. *J HumanitSocSci.* 2:1934-722.
- Myanmar Demographic Health and Survey 2015-2016, Ministry of health and sport. 2017. Naypyitaw, Myanmar.
- Reidpath DD, Allotey P. 2003. Infant mortality rate as an indicator of population health. *Journal of Epidemiology and Community Health.* 57(5):344-6.
- Rezaei S, MoradiKh, KaramiMatin B. Macro. 2015. Determinants of Infant Mortality in ECO Countries: Evidence from Panel Data Analysis. *Int J Pediatr.* 3(1.2):449-55.
- Rutherford, M. E., K. Mulhoolland, and P.C. Hill. 2010. How Access to Health Care Relates to Under-Five Mortality in Sub-Saha Africa. 15(5):508-519.
- Sarah Rabbani and Abdul Qqyum. 2015. Comparative Analysis of Factor Affecting Child Mortality in Pakistan. MPRA Paper No. 66533, posted 11, 05:07 UTC.
- World Health Organization. 2019. Under-Five Mortality.
https://www.who.int/gho/child_health/mortality/mortality_under_five_text/en/.
- Zakir M, Wunnava PV. 1999. Factors affecting infant mortality rates: evidence from cross-sectional data. *Applied Economics Letters.* 6(5):271-3.

Appendix

Table 1. The frequency distribution of child mortality according to selected variables

Covariate	Live Birth Population	Child Death	Percent Death	CMR (U5MR)	Chi-Square (p-value)
Sex of Child					
Male	1983	108	58.1	54	2.748* (0.097)
Female	1820	78	41.9	43	
Age of Mother at Birth					
15-24	725	35	18.8	48	12.534** (0.006)
25-34	1912	74	39.8	39	
35-44	1060	68	36.5	64	
45 and above	106	9	4.8	85	
Birth Order					
One	1118	45	24.2	40	8.032 (0.450)
2 to 3	1504	66	35.4	44	
4 to 5	689	44	23.7	64	
6 and above	492	31	16.7	63	
Size of Child at Birth					
Small weight	509	27	14.5	53	2.538 (0.468)
Average weight	2264	109	58.6	48	
Large weight	880	39	21.0	44	
Don't know	150	11	5.9	73	
Children Ever Born					
1 to 4	3066	147	79.0	48	0.316 (0.854)
5 to 8	661	35	18.8	53	
9 to 12	76	4	2.2	53	
Family Size					
Under 3 members	387	24	12.9	62	5.641 (0.130)
4 to 5 members	1444	78	41.9	54	
6 to 7 members	1146	55	29.6	48	
8 members and above	826	29	15.6	35	
Region and States					
Kachin	259	12	6.5	46	32.849** (0.003)
Kayah	293	8	4.3	27	
Kayin	291	15	8.1	52	
Chin	409	36	19.4	88	
Mon	198	8	4.3	40	
Rakhine	317	11	5.9	35	
Shan	297	25	13.4	84	
Yangon	96	5	2.7	52	
Bago	211	7	3.7	33	
Ayeyarwedi	254	11	5.9	43	

Tanintharyi	289	16	8.6	55	
Naypyitaw	195	7	3.8	36	
Mandalay	185	10	5.4	54	
Sagaing	277	7	3.8	25	
Magway	232	8	4.3	34	
Mother's Education Level					
No education	654	27	14.5	41	5.889
Primary	1678	93	50.0	55	(0.117)
Secondary	1195	48	25.8	40	
Higher	276	18	9.7	65	
Father's Education Level					
No education	872	47	25.3	54	2.920
Primary	1644	83	44.6	50	(0.404)
Secondary	1212	55	29.6	45	
Higher	75	1	0.5	13	
Mother's Working Status					
No working	1784	75	40.3	42	3.408*
Working	2019	111	59.7	55	(0.065)
Wealth Index					
Poor	2410	133	71.5	55	10.382**
Middle	741	37	19.9	50	(0.006)
Rich	652	16	8.6	25	
Breastfeeding Status					
No breastfed	1566	121	65.1	77	46.026***
Breastfed	2237	65	34.9	29	(0.000)
Child Immunization					
One time	2271	58	31.2	26	103.976***
Two times	1238	83	44.6	67	(0.000)
Three to five times	294	45	24.2	153	
Antenatal Care (ANC)					
No	1305	122	65.6	93	84.874***
Yes	2499	64	34.4	26	(0.000)
Contraceptive Use					
No	1926	119	64.0	62	13.911***
Yes	1877	67	36.0	36	(0.000)
Distance to Health Facility					
Big problem	1177	43	23.1	37	5.612*
Not big problem	2626	143	76.9	54	(0.018)
Place of Delivery					
Home	2481	116	62.4	47	1.903
Hospital	1215	62	33.3	51	(0.386)

Other health centers	107	8	4.3	75	
Sources of Drinking Water					
Piped	656	30	16.1	46	2.309
Well	2053	94	50.6	46	(0.511)
Spring	494	30	16.1	61	
Others	600	32	17.2	53	
Types of Toilet Use					
Flush	196	4	2.2	20	9.043*
Pit	2765	127	68.3	46	(0.029)
No facility	587	37	19.9	63	
Others	255	18	9.6	71	
Types of Cooking Fuel					
Electricity	525	21	11.3	40	1.048
Gas or Coal	605	30	16.1	50	(0.790)
Wood	2494	126	67.7	51	
Others (dry and bucket)	179	9	4.9	50	
Total	3803	186	100		

Source: MDHS 2015-2016

Note: * significant level at 10%, ** 5%, *** 1% and the value of bracket is P-value

Table 2. Results of logistic regression estimates for the effects on child mortality

Covariates	B	SE	Wald	df	Sig.	Exp (B):OR	95 % C.I for
Sex of Child Male (ref.) Female	-0.219	0.162	1.829	1	0.176	0.803	0.585 - 1.103
Age of Mother at Birth 15-24 (ref.) 25-34 35-44 45 and over	-0.280 0.264 0.207	0.226 0.234 0.429	1.537 1.274 0.232	1 1 1	0.215 0.259 0.630	0.756 1.303 1.230	0.485 - 1.177 0.823 - 2.061 0.530 - 2.852
Region and State Chin (ref.) Kachin Kayah Kayin Mon Rakhine Shan Yangon Bago Ayeyarwedi Tanintharyi Naypyitaw Mandalay Sagaing Magway	-0.614 -1.231 -0.298 0.059 -0.875 0.166 0.447 -0.170 -0.034 -0.254 -0.056 0.175 -0.614 -0.194	0.440 0.419 0.346 0.426 0.390 0.299 0.528 0.450 0.392 0.341 0.447 0.406 0.440 0.429	1.951 8.609 0.742 0.019 5.041 0.309 0.716 0.143 0.007 0.566 0.016 0.186 1.951 0.205	1 1 1 1 1 1 1 1 1 1 1 1 1 1	0.162 0.003 0.389 0.890 0.025 0.578 0.397 0.706 0.932 0.456 0.900 0.666 0.162 0.651	0.541 0.742** 0.638 1.061 0.417* 1.181 1.564 0.844 0.967 0.776 0.945 1.191 0.541 0.823	0.312-1.303 0.776-1.463 0.312-1.463 0.460-2.444 0.194-0.895 0.657-2.123 0.555-4.403 0.398-1.513 0.449-2.084 0.288-1.281 0.394-2.268 0.538-2.639 0.312-1.303 0.355-1.910
Mother's Working Status No working (ref.) Working	0.054	0.177	0.093	1	0.760	1.055	0.746-1.493
Wealth Index Poor (ref.) Middle Rich	0.058 -0.494	0.210 0.291	0.072 2.887	1 1	0.781 0.089	1.060 0.610*	0.702-1.601 0.345-1.079
Breastfeeding Status No breastfed (ref.) Breastfed	-1.736	0.186	86.69 8	1	0.000	0.176***	0.122-0.254

Child Immunization One time (ref.)							
Two times	1.114	0.215	26.75 3	1	0.000	3.047***	1.997-4.647
Three to five times	2.254	0.277	66.45 5	1	0.000	9.258***	5.542-16.383
Antenatal Care (ANC) No (ref.)							
Yes	-0.798	0.193	17.11 9	1	0.000	0.450***	0.309-0.657
Contraceptive Use No (ref.)							
Yes	-0.404	0.247	2.685	1	0.101	0.667	0.411-1.083
Distance to Health Facility Big problem (ref.)							
Not big problem	-0.012	0.276	0.002	1	0.965	0.988	0.576-1.677
Types of Toilet Use Flush (ref.)							
Pit	0.969	0.532	3.312	1	0.067	2.635*	0.928-7.478
No facility	1.238	0.556	4.958	1	0.026	3.449**	1.160-10.257
Others	1.455	0.588	6.114	1	0.013	4.283**	1.352-13.569
Constant	-2.759	0.739	13.92 2	1	0.000	0.063	

Source: MDHS 2015-2016

Note: * significant level at 10%, ** 5% and *** 1%

Table 3. Independent Variables of Study Population

Variables	Definition and Categories
Demographic factor	Demographic is the study of a population based on factors such as age, gender, race, marital status, death rate, birth rate and others type of information with survey question.
Sex of child	Sex of child who under- five years of age. (1= male, 2= female)
Age of mother at birth,	The age of the mother who gave birth to the child death. (1= 15-24 years, 2= 25-34 year, 3= 35-44 year, 4= 45 years and above)
Birth order,	The order in which a child is born. The first child is normally the oldest child that is born into a family. The middle child is can be the second and third child on the way to last or the baby of the family. (1= first rank, 2= second and third ranks, 3= fourth and five ranks, 4= don't know)
Size of child at birth,	The weight of babies born in the womb of mother. (Small weight =1, Average weight =2, Large weight =3, Don't know =4)
Children ever born	Number of children born to Mother. (1 to 4 =1, 5 to 8 =2, 9 to 12 =3)
Family size.	Family members of a household. (Under 3 members =1, 4 to 5 members =2, 6 to 7 members =3, 8 members and above =4)
Region/States	List of States and Regions in Myanmar. (Chin =1, Kachin =2, Kayah =3, Kayin =4, Mon =5, Rakhine =6, Shan =7, Yangon =8, Bago =9, Ayeyarwedi =10, Tanintharyi =11, Naypyitaw =12, Mandalay =13, Sagaing =14, Magway =15)
Socio-Economic factor	Socioeconomic status is a broad concept that includes such as educational attainment, occupation, income, wealth and deprivation.
M o t h e r ' s education level,	Education level of mother who have under- five years of child. (No education =1, Primary =2, Secondary =3, Higher =4)
Father's education level,	Education level of father who have under- five years of child. (No education =1, Primary =2, Secondary =3, Higher =4)
Mother's working status,	It indicates the type of job a child under five of age who is currently employed. (No working =0, Working =1)
Wealth index,	The wealth index is a composite measure of a household's cumulative living standard. It is calculated using easy-to-collect data on a household's ownership of selected assets, such as television and bicycles; materials used for housing construction and types of water access and sanitation facilities. (Poor =1, Middle =2, Rich =3)
Relative health	Health can be defined as physical, mental, or emotional

factor	well-being and as resource for living a full life.
Place of delivery,	Types of health centers needed for pregnant women healthcare services. (Home =1, Hospital =2, Other health centers =3)
Distance to health facilities	People living in remote and very remote areas generally have poorer access to health services than people in regional areas and major cities. (Big problem =0, Not big problem =1)
Breastfeeding status,	The process of feeding a mother's breast milk to her infant, either directly from the breast or by expressing (pumping out) the milk from the breast and bottle-feeding it to the infant. (No breastfed =0, Breastfed =1)
C h i l d immunization,.	The child might need to be immunized 2-4 times at different age, to be fully protected against some diseases. (One time =1, Two times =2, Three to five times =3)
Antenatal care,	Antenatal care is the routine health control of presumed healthy pregnant women with symptoms, in order to diagnose diseases or complicating obstetric conditions without symptoms, and to provide information about lifestyle, pregnancy and delivery. (No =0, Yes =1)
Contraceptive use,	The deliberate use of artificial methods or other techniques to prevent pregnancy as a consequence of sexual intercourse. (No =0, Yes =1)
Sources of drinking water,	Drinking water comes from natural sources that are either groundwater or surface water. (Piped =1, Well =2, Spring =3, Others =4)
Types of toilet use	Toilets are crucial for the healthy development of people, not to mention children. (Flush =1, Pit =2, No facility =3, Others =4)
Types of cooking fuel.	Many people are turning to other cooking fuels such as sunlight, processed plant wastes (rice husks and other crop wastes made into pellets or briquettes) and biogas. (Electricity =1, Gas or Coal =2, Wood =3, Others: dry and bucket =4)

Sources MDHS 2015-2016

The Myanmar JOURNAL

– Volume 9 Number 1 February 2022

28 February 2022

Yangon University of Economics (Myanmar)
Korea Myanmar Research Association (Korea)
2014~, Semiannual
ISSN : 2383-6563(Online)

Co-published with **Yangon University of Economics (YUE)** and
Korea Myanmar Research Association (KOMYRA)
<http://www.komyra.com/doc/submission.php>