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Association between Women's Status and Under-Five Survival in Indonesia: Evidence from 2007 Demographic and Health Survey

Master Thesis Population Studies

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ABSTRACT

Child mortality rate is a sensitive indicator against the health and socioeconomic status of a country (UN, 2010). Many factors affect this but issues regarding women's status have been considered as the strongest influence on child survival (UN, 1983). This study aims to analyze the association between women's status and under-five survival together with other proximate determinants.

The framework devised by Mosley and Chen, combined with Hagul's model of women's status, are the basis for this study. The data used is from the Indonesian Demographic and Health Survey conducted in 2007. Variables of women's status were combined based on a scale to build a variable called 'women's status'. The method of analysis is descriptive and explanatory study, which uses the binary logistic model.

The results showed that 72.6 percent of women hold high status and 96.0 percent of under-five children survived until the interview period. According to the Life Table, the probability of children to survive until 60 months was estimated at 0.90. Regression results showed that level of education and participation in decision-making had the highest odds ratio of survival on women's status variables, though women's employment status was not significant. In accordance with the objectives, univariate and multivariate demonstrated that women's status was significantly associated with under-five survival when other proximate determinants were included in the model. Moreover, the odds of survival increased for women with high status.

Since there is an association between women's status variables and under-five survival, so when one variable is improved, others are also affected, as they are related to each other. Further research might be able to facilitate the possibility of including women's perceptions so that it can show the differences within women's status can influence under-five survival.

CHAPTER I INTRODUCTION

1.1. Background

Under-five mortality is still the dominant cause of all deaths that occurred every year and amounted to more than 36 percent of deaths worldwide (United Nations, 2002). Every day approximately 21 thousand children die before reaching the age of five. Most of these deaths occur in developing countries (WHO, 2010). Health and development programs around the world are trying to prevent these needless deaths. Yet, at the same time, there is evidence that mortality decline may be slowing down or even halting in many developing countries. This raises questions about the effectiveness of current strategies to increase child survival rates.

The tools and the knowledge for child survival are not being implemented. In fact, based on the results of the Demographic and Health Survey (DHS), the rate of decline for child mortality is not speeding up, but rather slowing down. United Nations (UN) stated that in 2010, 7.6 million under-five children died, down from 8.1 million in 2009 and 12.4 million in 1990. For more developed countries, the deaths declined significantly, but meanwhile reductions among less developed countries were, on average, much less than those among the more developed countries. Among the regions, Africa and Southeast Asia still have high child mortality (WHO, 2011). However, some Southeast Asian countries are close to achieving a Millennium Development Goals (MDG) targeted in reducing child mortality, excluding Indonesia (MDG, 2010). The under-five mortality rate in Indonesia is still higher than those of neighbouring countries in Southeast Asia. In 2007, the under-five mortality rate in Indonesia was about 15 times higher than in Singapore which was only 3/1000 and seven times higher when compared to Malaysia which was only 6/1000 live births (UNICEF, 2010).

If child mortality receives proper actions, about a million young lives could be saved, which would meet one of Millennium Development Goals to ensure survival, reduce morbidity and mortality, and promote healthy growth and development. To date this discussion is found primarily in the popular press; there have been very few empirical studies that have attempted to test the impact of women's status on child survival. In recent years policy makers and planners have begun to take an interest in the potential impact of women's status on child mortality rates. In some discussions of the problems associated with child survival, women's status is very important to child survival for the individual-level analysis (Berman, Kendall, and Bhattacharyya, 1994). In short, the physical and temporal boundaries inherent in prevailing models of child survival hamper the understanding of the complex social mechanisms by which the women affect the children's health since they are very involved in their relations with health and family welfare, including in terms of child survival. It can be understood as psychological and in fact, mothers have a lot of contact with their children, from the time in the womb until birth and in treatment.

The results of the Demographic and Health Survey in 2007 showed that there was a definite and positive relationship between the status of women and infant/child survival rates, the higher the status of women the higher the rate of child survival. This study is an attempt to elucidate the association between women's status and under-five survival in Indonesia.

The topic of this study is in macro level theory, which is aimed at understanding how women's status affects child survival (Babbie, 2010, p. 34). This study is made within the framework of certain paradigms, namely feminist paradigms and conflict paradigms. The feminist paradigm is a paradigm that views and understands women's background and behaviour through the experiences of women and/or examines the generally deprived status of women in society that affects child survival (Babbie, 2010, p. 39). Babbie (2010) stated that feminist paradigms not only reveal the treatment of women, but also examine other aspects of social life. This study concerns itself with the issue of women's status and their behaviour in social life. The theories and study focused on differences in women's status and how they are related to under-five survival. The conflict paradigm, on the other hand, is a paradigm that views women's status and behaviour as attempts to prevent under-five's morbidity and mortality (Babbie, 2010, p. 36).

This study is also based on the theories and techniques of demography and aims to provide a conceptual analysis and estimation for understanding the phenomena, from there deriving some policy implications and policy recommendations relevant for its development. Concepts, definitions, and use of measurements as the operational definitions are approached in a demographic way based on the Indonesia Demographic and Health Survey (IDHS) Questionnaire.

The facts mentioned above explain the relevance of this study which will help identify the relationship between variables of women's status associate with under-five survival in Indonesia. The reality and background of women's status variables can be seen to have effects on under-five survival.

1.2. Objective

The general objective of this study is to examine the association between women's status and under-five survival in Indonesia.

1.3. Research Questions

In accordance with the objective, this study formulates the research questions as follows:

a. What is the influence of women's status in the determination of under-five survival together with other determinants in Indonesia?

Sub questions:

b. What is the under-five survival rate, what are its probability and its pattern in Indonesia?

c. What is the status of women in Indonesia?

d. What is women's status' relation with under-five survival? How does women's status affect the survival of their under-five children?

e. What factors of women's status and other determinants have influence on under-five survival in Indonesia?

f. How do other proximate determinants influence under-five survival with women's status entered in the model?

1.4. Structure of Thesis

1. Chapter I Introduction

This chapter contains background information, objectives of the study, research questions, and the organization of this thesis.

2. Chapter II Theoretical Framework

This chapter contains the theories used as the main tools of the study and literature reviews as the secondary sources to support this study that are relevant, the conceptual framework for the study and the submission of hypotheses, as well as the definition of concepts and categorisation, and operationalization of variables.

3. Chapter III Research Design

This chapter contains the type of research methods employed, descriptions of the data, and the method of data collection, and the technical analysis and testing hypothesis.

4. Chapter IV Results

This chapter contains the introduction of the data analysis, Lexis Diagram, Kaplan Meier's results, descriptive results of women's status variables and other proximate determinants and the results of univariate and multivariate regression as the final model.

5. Chapter V Conclusions and Discussion

This chapter contains conclusions and discussion of the results. Recommendations for further research are also included.

CHAPTER II THEORETICAL FRAMEWORK

2.1. Theories

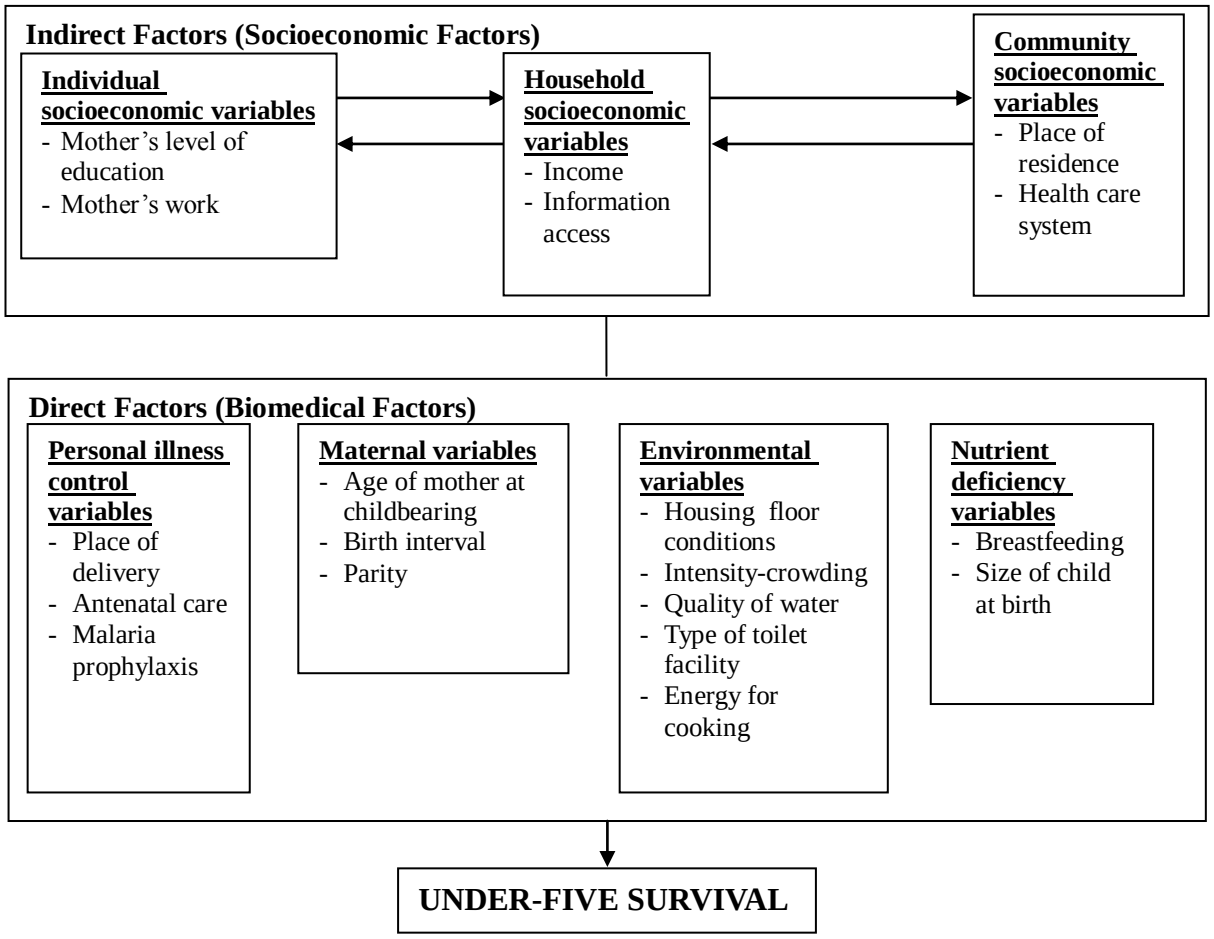
2.1.1. Mosley and Chen Theory of Child Survival

In 1984, Mosley and Chen examined a range of socio-economic determinants (independent variables) and illustrated how they operate through the proximate determinants to influence the level of growth faltering and mortality. The socio-economic determinants are grouped into three broad categories of variables. Firstly, it includes individual level variables of mothers, fathers, and traditions/norms/attitudes. Secondly, household-variables such as income or wealth are considered. Thirdly, it takes into account community level variables, which include ecological settings such as climate, soil, rainfall, temperature, altitude, and seasonality, then political economy such as physical infrastructure, political institutions, and the last looks at established health systems such as disease control by modern medicine, immunisation, public health facilities and cost subsidies related to health. These three categories determine a healthy surviving child in range of the socio-economic determinants.

On the conceptual model, Mosley and Chen (1984) stated that socio-economic variables are determinant of morbidity and mortality at the individual, family, and the community level. Correlations between mortality and socio-economic characteristics are used to generate causal inferences about mortality determinants. Income and maternal education are two commonly measured correlates (and inferred causal determinants) of child mortality. In addition, according to Mosley and Chen (1984) child mortality is a result of the interaction between socio-economic and environmental variables. The environmental variables work indirectly with biomedical variables, namely maternal factors, environment, nutrition, injury, and disease control, while the socio-economic variables are maternal education, employment status, participation in family planning, housing, and economic activity.

Figure 1 depicts a framework that shows how these seven groups of proximate determinants operate on under-five survival. All proximate determinants in the first two groups influence the rate of shift of healthy children towards the socio-economic level. The other factors influence both the rate of illness (through prevention) and the rate of recovery through treatment (Mosley and Chen, 1984).

Figure 1: Conceptual Model of Mosley and Chen (1984)



2.1.2. Women's Status' Theories

According to Hagul (1985), the concept of women's status is actually demonstrated through three sub-concepts, namely power, the mastery of the power source, and prestige. With power, Hagul looks at how women are free from male domination, which is also called female autonomy, while the mastery of the power source is how far women have a form of material wealth (land, income, food, and economic activity) and non-material wealth (of knowledge and education). Prestige is the attitudes and views of others towards women. Some examples are the level of literacy, education, and employment status. At first glance it appears that these three inter-related sub concepts in shaping the status of women have to do with the control of resources which will provide women with power/autonomy that ultimately bring prestige. To measure these sub concepts, Hagul used several indicators, namely:

a. Demographic indicators, including infant mortality, age at first marriage, and use of contraceptives.

b. Economic indicators, including economic activity and employment status.

c. Indicators of kinship, including dowry, inheritance, and polygamy.

d. Access to facilities, including sports facilities, education, and health.

2.1.3. Theories of women's status effects on child survival

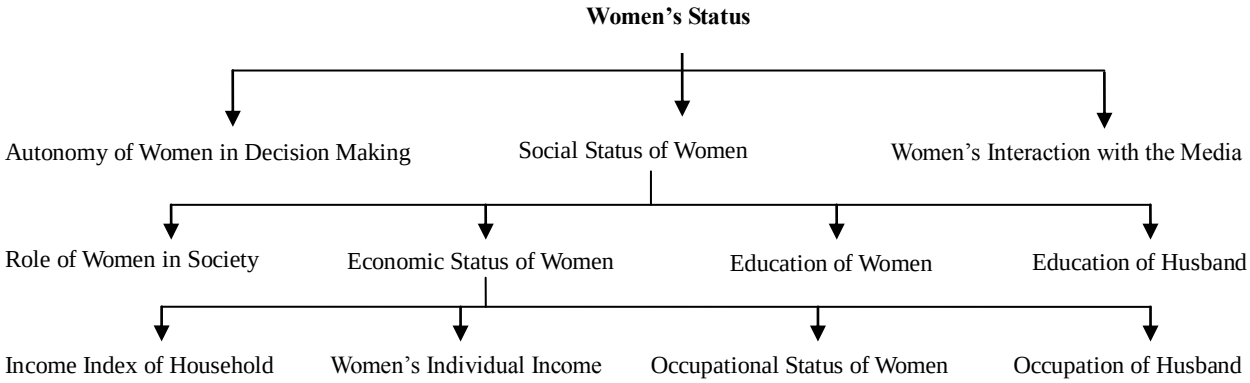
Chen and Williamson (1997) demonstrated that women's education, health, and reproductive autonomy as well as overall education levels were all useful predictors of change in child mortality. These indicators measure different aspects of women's status dimensions that are important as predictors of child survival. Those indicators fall within the framework of the theory of Mosley-Chen and are the socio-economic factors affecting child survival. Curiously, however, there have been relatively few attempts to systematically explore the influence of women's status on health outcomes in the developing country context (Dyson & Moore, 1983; Shisana & Celentano, 1987; Carey, 1993; Myntti, 1993; Castle, 1994). Starting with the pioneering work of Berkman and Syme (1979) in Alameda county, subsequent explorations have revealed a powerful connection between the structure and supportive function of women's status, and increased individual survival and physical health (Cohen & Syme, 1985; House, Landis, & Umberson, 1988).

2.2. Literature Review

2.2.1. Women's Status

Several studies in South Asia have examined certain indicators of women's status. In 1983, a study carried out by Dyson and Moore showed that women in South India hold higher status by virtue of their lineal heritage, educational attainment, and ownership of land and other properties. A study in India considered only a few major dimensions in evaluating women's status, such as caste, education, occupation of husband, and their influence in decision-making (Mahadevan, 1987). Some studies have also been conducted to explore other equally relevant dimensions of women's status, such as autonomy in decision-making, their role in society, interaction with the media, ownership of properties by females, and the influence of these factors on fertility and health seeking care behaviour (Audinarayan et al. 1986). The figure below shows women's status based on the state of Uttar Pradesh:

Figure 2: Women's Status by Yadava, et al. in 1990



In analysing the demographic conditions of India, Dyson (1983) concluded that the autonomy

of women in the family is a factor that is most important in controlling fertility and child survival. Martin et al. (1983) gave results from the World Fertility Survey data, which shows that education is the most important correlate of mortality. Interestingly, even when the father's education is controlled for, a mother's education is still strongly and positively associated with child survival.

Women's access to the material wealth seen in economic activity and employment status give autonomy to them and support them in making decisions for themselves and the other people. On the other hand, women who work also must accept the consequences of losing some time, so the time to pay attention to their families will be reduced. As shown in research done by Adioetomo (1983), children of working mothers do not have a higher survival than those who have household mothers. However, children of poor families seem to be the least likely to receive health care. Lack of proper health care is a function of poverty; children may have limited chances to live longer. Research has shown that poor families use less medical care than those who are insured, and they are less likely to seek care when sick. This means that more children in poor families will continue to die because of lack of access to child health care (Reindhart, 1987).

It has also been demonstrated that women who have access to information about the health of mother and child could be an integral part of improving child survival in rural Guinea Bissau (King, et al. 2010). In addition, Alisjahbana (1983) in his research showed that there is a relationship between low child survival rates when a woman's age at marriage is below 20 years. In their research, Hobcraft, McDonald, and Rutstein (1985) said that children born to teenage mothers generally experience considerable excess risks in mortality.

In some developing countries including Indonesia, there is a reciprocal relationship between child survival and birth rates. In this case, efforts to lower birth rate through family planning programs with a delay of age of marriage, longer birth spacing and minimizing the number of children in the family will increase child survival rates (Yahya, 1985). In addition, various researchers noted that acceptance of family planning programs in Indonesia, among others, largely influenced infant and child mortality in a family. So to reduce infant mortality in order to gain child survival, family planning programmes are needed.

Based on the theories of women's status and previous studies about women's status on child survival, to reach the objectives and thus to answer to the research questions, the variables used in women's status to point out the influence in under-five survival in this study are women's decision-making, educational level, employment status, income, interaction with media, age at first marriage, and participation in the family planning programme. This has been a standard instrument in analysing and understanding under-five mortality in association with women's status and this has been documented in DHS results.

2.2.2. Other Proximate Determinants

Place of Residence

Andoh, et al. in 2007 showed that child survival rates were higher in urban areas than in rural areas. In 1990, Bocquier et al demonstrated that the urban advantage matters for child survival in the eighteen countries they examined.

Personal Illness Control

Andoh (2007) showed that place of delivery was significantly related to child mortality. Antenatal care and malaria prophylaxis were also associated with under-five survival, in which the effect of antenatal care would be to reduce the risk of child mortality. Similarly, malaria prophylaxis contributed to minimize the risk of under-five mortality as well (Brockerhoff and Derose in 1996).

Age of Childbearing

In 1996, Broeck examined whether a mother's age of childbearing could indicate that older mothers reduced child mortality in a rural African community. Popkin (1996) has also shown that in tropical regions a mother's age at childbearing is crucial to child survival.

Birth Spacing

In 1988, Potter's research showed that there is a strong and consistent relationship between birth spacing and child survival in Mexico. In 1984, Santow and Bracker studied that there was a strong positive association between child mortality and the time to the next birth in West Java and Indonesia. In 1985, Hobcraft et al. found that child spacing is an important source for increasing child survival.

Parity

In a study using DHS data from Nigeria, it was shown that children born as the fifth child or further down the line had a 77% increased risk in dying over a baseline group (Antai, 2008). In a sample study from India, 51.3% of deaths were of children who were third or later in birth order (Taneja and Vaidya, 1997).

Environmental Variables

A study of the relationship between environmental variables and child survival was conducted in 1989 by Casterline et al. in Egypt and showed that household drinking water, the type of toilet facilities, and other household characteristics, including the number of people living in the house can explain child survival effects. Based on Mosley and Chen's theory (1984) the quality of water supply, sources of drinking water and food preparation are important determinants of exposure to disease and crowded sleeping conditions predispose household members to respiratory and skin infections. In addition, Hong, Mishra, and Michael (2007) found that the type of cooking fuel and energy was

significant in reducing the risk of child mortality since it was essential for the proper cooking of food, boiling water, and sterilization of stored food and utensils (especially for infant bottles).

Duration of breastfeeding

In the British Medical Journal 1985, Brined et al. showed that there was a strong association between breastfeeding and survival of the children. In 2009, Thong determined that children that were breastfed and immunized showed a longer duration of survival than those not breastfed and given immunization in Vietnam. A similar study also conducted in Jordan (Nur, Osman; 1985) indicated that women who breastfeed longer to their children had longer survival duration of their children which explained the lower relative risk of dying.

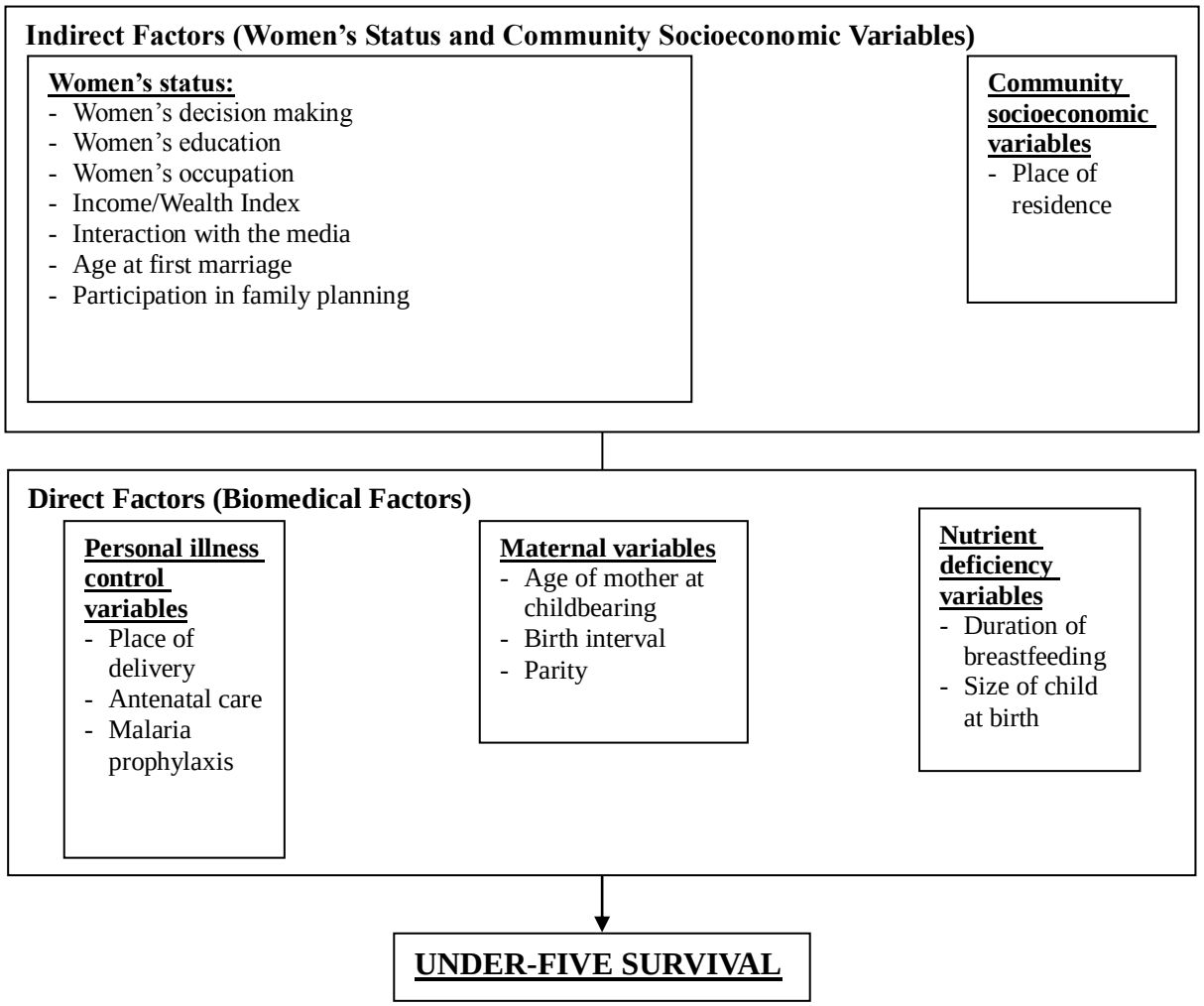
Birth weight

In 2008, Uthman proved that there was a strong relationship between birth weight and survival. Hope in 1992 demonstrated that the lower the birth weight the greater the chances of death or other severe impairments. This amplifies risks to the children's health, malnutrition and disease. Children born with low birth weight are more likely to die during the first year of life when compared to children born with normal weight.

2.3. Conceptual Model

Within the framework of analysis adopted for this study, several previous studies demonstrated a reciprocal relationship between socio-economic factors and women's status with indirect and direct factors of child survival. Based on this analysis, the conceptual framework of this study can be presented in following models:

Figure 3: Conceptual Models on Women's Status Variables and Under-Five Survival



In Figure 3, the research question is explored by a path analysis that highlights indirect and direct factors. The diagram should be read as flowing from top to bottom. The left-upper box is the set of independent variables used to predict women's status, and along with the women's-status variables (the right box), the indirect and direct factors predict under-five survival. Women's-status variables contribute practically to the total effect on under-five survival, mainly because this variable behaves inconsistently on the different types of status. Direct factors highlight three biomedical factors: personal illness, maternal variables, and nutrient deficiency variables. Environmental variables are eliminated in the box since this study uses a wealth index variable in the women's status that integrates all background characteristics that are used throughout the report as a proxy for the long-term standard of living of the household. It is based on the data for household ownership of consumer goods, dwelling characteristics, source of drinking water source, toilet facilities, and other characteristics related to the socioeconomic status of households (DHS, 2007).

Based on the previous study by Fitriana (2004) in Indonesia, the seven variables that contribute to women's status can be combined into a scale to define the status of women in Indonesia. Each variable is scored according to their importance in terms of raising the status of women.

Decision-making and education are the most important indicators and may affect other indicators, so decision-making and education are considered to have first and second ranks and given the highest score of seven and education with a score of six. These are followed by working status with the score of five, wealth index with the score of four, interaction with the media is given a score of three, age at first marriage with a score of two, and participation in family planning with a score of one. The highest possible score is 93 and the lowest is 28, which is then divided into two with the criteria of <= 51 being low status and > 51 being high status.

2.4. Definitions of Concepts and Operationalization

2.4.1. Definition of Concepts and Operationalization

The definitions and operational measurement of all variables in this study are as follows:

Table 1: Definition of Concepts and Operationalization

Variables	Definition of Concept	Operational Measurement
Dependant Variable		
Under-five survival	The probability that children aged under-five years born will survive some period of time before reaching the age of five; it is concerned with reducing the number of under-five mortality (WHO, 2005).	Child is alive, coded as 0 = No; 1 = Yes
Independent Variables		
Women's Status	Women's Status is formed around a series of structures, and education, information, and economic factors such as resource use, ownership and control, legal and ideological. The status and position of women is reflected by their ability to make decisions in the spending of household income, the quantity and quality of child care they are able to provide, and health-seeking behaviours (including family planning decisions). The outcomes of decisions based on women's status and position also inform us about their status and position (ADB, 1999).	1 = Low status; 2 = High status
Decision-making	Participation in decision-making is that women share and express opinions - and ideally exert influence-regarding political, economic, management or other social decisions in the households (The World Bank Participation Source book, 1998). Participation can be seen as a process of empowerment, through which women influence and share control over households' initiatives, the decisions and resources that affects all the members (WB, 1994). This participation includes women's involvement in taking	Final say on deciding own health care, making large household purchases, daily needs, visits to families or relatives, food to be cooked each day, coded as 1 = others; 2 = women with husbands/partners; 3 = women only

Variables	Definition of Concept	Operational Measurement
	decisions in the family.	
Education	Any act or experience that has a formative effect on the mind, character, or physical ability of an individual, also refers to the process by which society deliberately transmits its accumulated knowledge, skills, and values (UNESCO, 2008).	Highest educational level, coded as: 1 = no education; 2 = primary; 3 = secondary; 4 = higher
Employment status	The legal status of an economically active person with respect to his or her employment, as either an employee or working on his/her own account (self-employed), that is to say, the type of explicit or implicit contract of employment with other persons or organizations that the person has in his/her job. (UN, 1998).	Women currently working, coded as 1 = no; 2 = yes
Wealth index	A composite measure of a household's cumulative living standard. The wealth index is calculated using easy-to-collect data on a household's ownership of selected assets, such as televisions and bicycles; materials used for housing construction; and types of water access and sanitation facilities (IDHS, 2007).	Wealth Index, coded as 1 = poorest; 2 = poorer; 3 = middle; 4 = richer; 5 = richest
Interaction with the media	The frequency of women to get information in obtaining knowledge of classified information or receive news (DHS, 2007). Based on DHS data, frequency of interaction with the media in the study is how often women read newspapers/magazines, listen to the radio and watch television every day.	Frequency of reading newspapers or magazines, listening to radio, watching television every day, coded as: 1 = not at all; 2 = less than once a week; 3 = at least once a week; 4 = almost everyday
Age at first marriage	The age when a woman firstly creates kinship by social union or legal contract between people. It is the first time when a woman has an institution in which interpersonal relationships, usually intimate and sexual, in a variety of ways, depending on the culture or subculture in which it is found. Such a union, often formalized via a wedding ceremony, may also be called matrimony (Oxford University Press, 1985).	Age of women's first marriage, continuous variable
Participation in family planning program	The willingness to plan when to have children and the use of birth control and other techniques to implement such plans. Family planning programmes are programs to regulate the number and spacing of children in a family through the practice of contraception or other methods of birth control. Other techniques commonly used include sexuality education, prevention and management of sexually transmitted	Current contraceptive method, coded as 1 = not using; 2 = using

Variables	Definition of Concept	Operational Measurement
	infections, pre-conception counselling and management, and infertility management. It is most usually applied to a female-male couple that wish to limit the number of children they have (WHO, 2010).	
Other Determinants		
Community Socioeconomic Variables		
Place of residence	The place where a person lives, stays, and resides everyday in a particular locality while doing his/her activities or domicile where the person makes his/her home (OECD, 1991).	Current place of residence, coded as 1 = urban; 2 = rural
Personal Illness Control Variables		
Place of delivery	The birthplace where the babies were born. In DHS, the place of delivery points to the place where the mothers got help to deliver the new-born until the baby was born.	Birthplace of the babies, coded as: 1 = home/other homes; 2 = hospital, clinic, other health centres
Antenatal care	The kind of medicine that deals with the care of women during pregnancy, childbirth, and the recuperative period following delivery. This includes recording medical history, assessment of individual needs, advice and guidance on pregnancy and delivery, screening tests, education on self-care during pregnancy, identification of conditions detrimental to health during pregnancy, first-line management and referral if necessary (WHO, 2006).	Number of tetanus injections before birth, continuous variable
Malaria prophylaxis	Prevention of malaria diseases by having slept under a bed net (WHO, 2012).	Children under age five sleep under the bed net, coded as: 1 = no; 2 = yes
Maternal Variables		
Age of mother at childbearing	The age of a woman when she is having a process of conceiving, pregnancy, and giving birth to a child or delivering a baby (American Journal of Public Health, 2002).	Age of mother at childbearing obtained by considering differences from date of birth of child with the date of birth of mother, measured in months, continuous variable
Birth interval	The time lengths of interval between onset of sexual relations by a woman and the birth of her first child and intervals between successive births from one's child birth until the next	Preceding birth interval, measured in months, continuous variable

Variables	Definition of Concept	Operational Measurement
	child's birth (USAID, 2011).	
Parity	Number of live born children a woman has delivered at more than 20 weeks of gestation during her entire reproductive life, commonly parity is noted with the total number of pregnancies (UNESCO, 2006).	Total children ever born, continuous variable
Nutrient Deficiency Variables		
Breastfeeding	The normal way of providing young infants with the nutrients they need for healthy growth and development. Virtually all mothers can breastfeed, provided they have accurate information and the support of their family, the health care system and society at large (WHO, 2012).	Duration of breastfeeding, measured in months, continuous variable
Birth weight	The body weight of the baby at its birth. It is a strong indicator not only of a birth mother's health and nutritional status but also a newborn's chances for survival, growth, long-term health and psychosocial development (UNICEF, 2012).	Birth weight, measured in grams, continuous variable

2.5. Hypotheses

Based on this background, the formulation of the problems, and the framework model noted previously, the submission of hypothesis is to be formulated as follows:

a. There is a strong and positive association between variables of women's status and under-five survival. Women with high status tend to have children with higher survival rates.

b. There is a positive association between the women's status variable and under-five survival with other determinants included in the model.

CHAPTER III RESEARCH DESIGN

3.1. Type of Research

This research is quantitative research using a cross-sectional study based on evidence from Indonesian Demographic and Health Survey (IDHS) in 2007. The research describes a combined summary of descriptive analysis and explanatory study, which are selected in accordance with the objectives of the research, scientific opinion about the statistical values, and comparisons between these findings with the results of other studies.

Descriptive analysis is used to describe the value of existing statistics in a table based on data from IDHS, which has an important role in reporting the results. Furthermore, it is meant to analyze and interpret the meaning of the data.

Meanwhile, the explanatory study sets out to explain the nature or mechanisms of the relationship between the dependent and independent variables, through which the study attempts to identify cause and effect. Furthermore, the explanatory research attempts to go above and beyond the descriptive analysis in order to identify the actual reasons a phenomenon occurs, which includes explaining things in detail and enriching the reasons behind a theory (Dallaire, 2007).

3.2. Data

The DHS collects a wealth of information on widely different topics for a sample of the population. It is specifically designed to gather various information of the birth and death rates, prevalence of family planning and reproductive health in particular. In line with that goal, the questions in the IDHS refer to an international DHS-scale. The information is processed and presented in tables that describe the situation at that particular time, which results in a cross-sectional survey.

3.2.1. Place and Time of Research

The research is based on 2007 Indonesian Demographic and Health Survey (IDHS) data of all 33 provinces of the country, which has been conducted periodically in every five years by Statistics Indonesia (BPS). The most recent survey conducted in 2007, is used as the dataset of this research.

3.2.2. Quality of The Data

Accurate statistical data, good, right, complete and timely information should be the results of the survey and census conducted by Statistics Indonesia (BPS). However, national surveys in developing countries are prone to incomplete reporting of the responses. Additionally, complex questionnaires inevitably allow scope for inconsistent responses to be recorded for different questions. Incomplete or inconsistent data in files severely complicates the results-based analysis. In order to avoid these problems, the DHS program has adopted a policy of editing and imputation, which results

in a data file that accurately reflects the population studied and may readily be used for analysis (DHS, 2007).

However, even though the IDHS data looks good, some of the data might still be false (illogical, inconsistent, incomplete or even puzzling), which, when the data are used, results in an analysis that is flawed, leading to conclusions which may be wrong, leading to the implementation of inappropriate measures as they are based on flawed results, susceptible to bias, and so on. The questions in the questionnaires are usually relatively easy to answer, however, consistency between the answers with the others need to be addressed. Instead, missing values are assigned in the data file. In the final report, the way the missing values are handled varies depending on whether the table shows a percentage-based distribution or individual cell percentages of respondents that do not sum to 100 percent. For tables presenting a percentage-based distribution that sums up to 100 percent, missing values are shown when they account for at least 1 percent of cases in any row.

3.2.3. Population and Sampling

The Demographic and Health Survey 2007 was designed in 2000. It includes a description of the social and economic status of the household, ever married women between the ages of 15-49 years, and married men aged 15-54 years. The 2007 IDHS applied two stages of sampling in its methodology.

This study used a women's questionnaire to gather basic details of mothers and children, including information about the household. Thus, the children's data files from women's questionnaire are used as the dataset for the analysis. Based on the dataset there were 17,561 women who bore children between August 2002 and July 2007. The sample size in this study is as many as 18,645 children in Indonesia (without weighting the cases). The unit of observation in this study are children who were born in Indonesia between August 2002 and July 2007.

3.3. Dataset Source

Data collection on IDHS was conducted through direct interviews (face-to-face) between the interviewer and respondent. Dataset used in this research is obtained by retrieving secondary data from www.measureddhs.com (raw data). The Indonesian Demographic and Health Survey Indonesia (IDHS) year 2007 is used since it was the most recent data available and also was the last survey conducted in Indonesia.

3.4. Ethical Considerations

The study is based on the analysis of secondary data, for which permission for usage was obtained from MEASURE DHS. All DHS data should be treated as confidential. All participant identifiers were excluded from the obtained dataset. No identifiable personal information on individuals would be captured and for publication purposes only aggregate results would be reported.

Informed consent was obtained from all the respondents selected in the IDHS. No effort is made to identify any household or individual respondent interviewed in the survey (DHS, 2011).

3.5. Technical Analysis and Testing Hypothesis

This study used three kinds of analysis techniques, the Life Table and Kaplan Meier analysis, descriptive analysis, and univariate and multivariate logistics analysis.

3.5.1. Life Table and Kaplan Meier Analysis

The first objective of this study is mainly to provide explanations on the survival pattern of under-five children in Indonesia. The life table can answer the question of the chance of survival. It will describe the survival patterns and mortality experience of under-five children in Indonesia. The life table handles the variable time of entry, which is the year of birth of under-five children, and generates a survival curve. For survival analysis, data were used for the timings or duration of under-five children alive until they experienced the event of death for the August 2002 to July 2007 birth cohorts.

The Kaplan-Meier analysis will be used to estimate the probability of surviving with the median of survival time and the hazard probability (of dying). The Kaplan–Meier estimator will be used to measure the probability of under-five children living for a certain amount of time (Blossfeld and Rohwer, 2002). In this study, it will also be used to measure the length of time under-five children survived and measure the time until they died. Estimating the chances of survival obtained with this method is only applicable for the age at which mortality events occur. While estimation of survival changes at the age where there is no incidence of death therein, they will be equal to the estimated chance of survival at an earlier age, in which these events occur at the age of death.

This study has a time interval that an entire cohort of under-five children enters at the same time and exits the sample because they reached the age of five years old. Thus, by the end of the survey period, some children will still be alive and survive the entire survey period; in particular those children who were born late in the survey will not have died yet. Those observations, which contain only partial information, are called censored observations.

3.5.2. Descriptive Analysis

Estimation of frequency is used to estimate the expected value in the cross tabulations by using the frequency of the observation cell of variables. After the cell of frequency is obtained then, in order to test the suitability of the expected value of cells, a regression model can be generated with the frequency of observations using statistical suitability of the likelihood ratio test statistic (Agresti, 1990).

3.5.3. Univariate Analysis

The Kaplan-Meier method does permit comparisons between male and female at under-five children. It cannot, however, be used to measure the impact of a continuous variable (e.g., women's childbearing age, birth interval, or parity) on the probability of an event, nor can it definitively quantify the risk of the event according to the value of a variable. Univariate analysis can be used to analyze the data that are categorical or continuous. Analysis using the univariate regression model is not restricted and will distinguish between the explanatory variable and the response variable. This analysis assumes that the response variable is influenced only by one other factor.

3.5.4. The Multicollinearity Test

The multicollinearity test is used to determine the presence or absence of multicollinearity deviation. The classical assumption is that there is a linear relationship between the independent variables in the regression model. If this problem exists, it could result in regression model estimates of the coefficients becoming unstable, which is a sign of a regression coefficient that allegedly conflicts with that expectation based on theoretical considerations and experience before, which might cause the standard errors for the coefficients to get wildly inflated. When the selection of the best regression (best subset) is done, there may be some variables that do not appear in the model.

In this study, the multicollinearity test that will be done examines the inflation factor (VIF) in the regression model. In general, if the VIF is greater than 5, then independent variables have multicollinearity problems with the other independent variables (Netter, et al., 1990).

3.5.5. Multivariate Analysis

Multivariate analysis assumes that the response variable is influenced by multiple factors (and even combinations of factors). Analysis with the multivariate logistic model is used with the following aims:

a. Knowing the pattern of association between groups of categorical variables that includes bivariate associations and multiple associations between three variables or more. So, it can illuminate the influence of explanatory variables together to influence a response variable. Moreover, it can also show the patterns in the relationship between the explanatory variables.

b. Estimating the number of observational expectations (expected counts) in each cell of population in the table formed by a group of variables.

c. Calculation of the ratio of the prevalence and trend (odds ratio).

The core of the multivariate analysis is the selection of the best model that describes the relationship between the variables. Multivariate regression is most useful for compound tests of coefficients.

3.5.6. Interaction Effect

In statistics, an interaction may arise when considering the relationship between two or more variables and describes a situation in which the simultaneous influence of two variables on a third is not additive (Fienberg, 1978). When an interaction effect is present, the impact of one variable depends on the level of the other variable. In this study, interaction will be used when the main effect of one independent variable on the dependent variable does not exist.

CHAPTER IV RESULTS

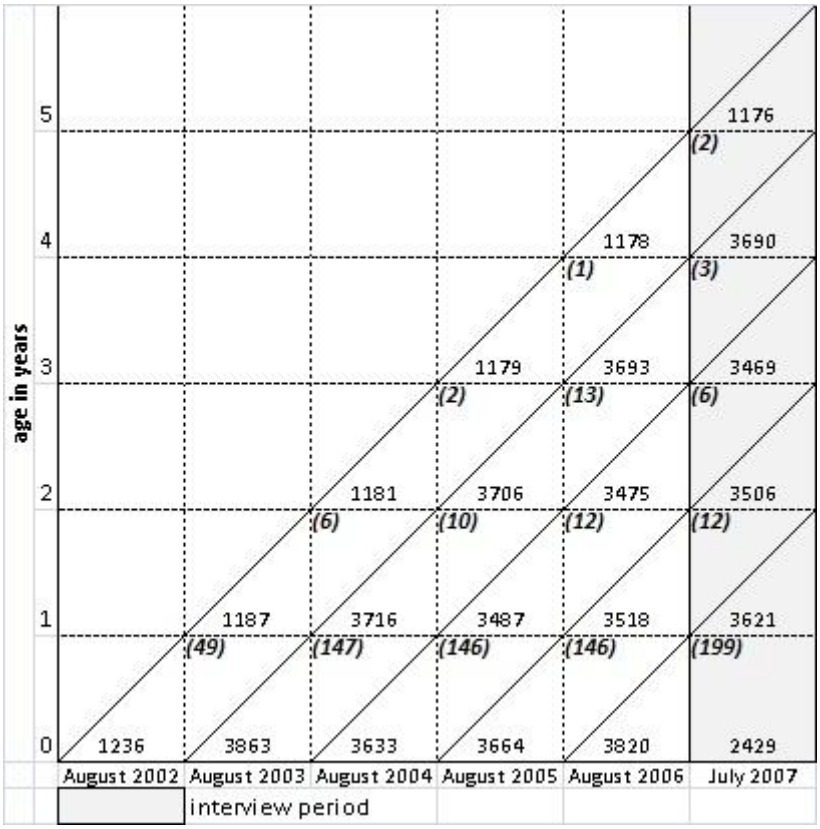
4.1. Introduction

This chapter presents the data analysis and interpretation of the findings and results. The purpose of this study is to explore and describe the association of women's status in the determination of child survival together with the other proximate determinants. The data is presented according to the objectives of the study.

4.2. Lexis Diagram

Six birth cohorts (2002, 2003, 2004, 2005, 2006, and 2007) were registered in IDHS dataset. The total exposure and occurrence/event of death of birth cohort children is depicted in the Lexis Diagram, Figure 4, which presents the birth history and survival patterns over time of children who were born between August 2002 and July 2007. Children who are still alive after July 2007 (the last month of interview) will be censored.

Figure 4: Lexis Diagram of 2002 to 2007 Birth Cohorts of Under-Five Children



4.3. Life Table and Kaplan Meier Result

Table 2 shows the Life Table estimates of survival chances. Based on the 2007 DHS sample data in Indonesia, the probability of children to die is only 0.003 at age zero. With the Kaplan-Meier method, the estimated chance of survival at this age is the same as the estimated chance of resistance; with the probability of children living until the age of one being 0.997, as is shown in Table 2.

Therefore, the results of the Life Table and Kaplan-Meier tests answered the two sub-questions, which are; "What is the probability of under-five survival in Indonesia?" and "What is the pattern of under-five survival in Indonesia?

Table 2: Life Table of Under-Five Children in Indonesia, 2007

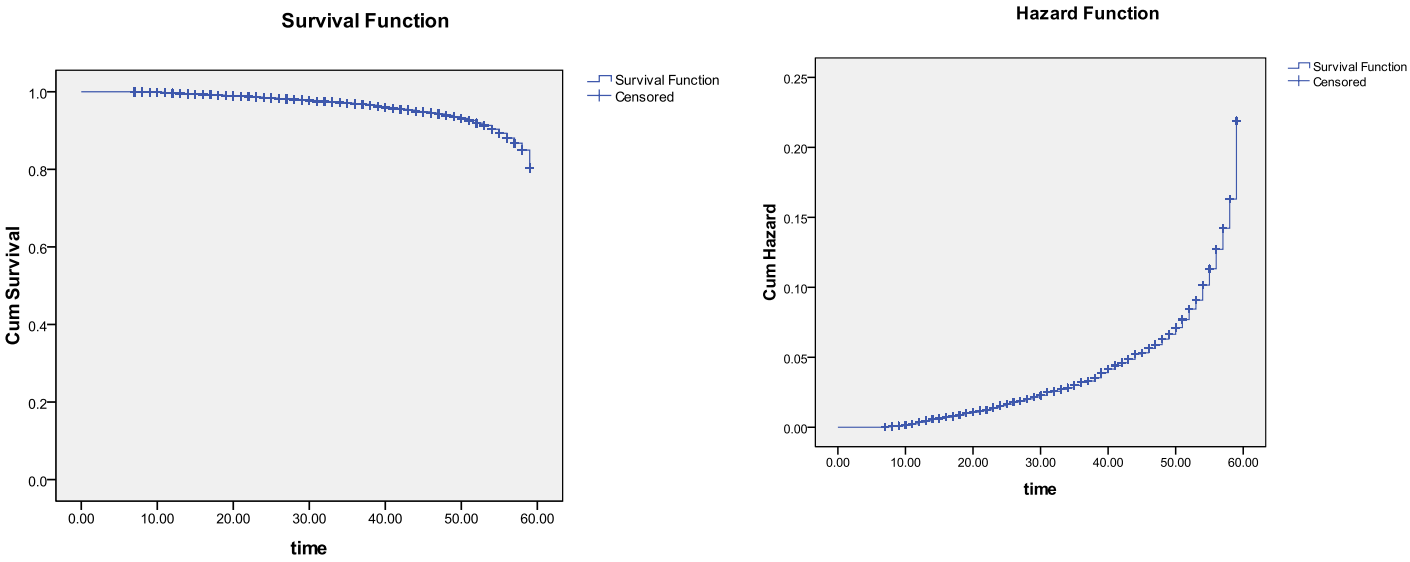
Life Table[a]

Interval Start Time	Number Entering Interval	Number Withdrawing during Interval	Number Exposed to Risk	Number of Terminal Events	Proportion Terminating	Proportion Surviving	Cumulative Proportion Surviving at End of Interval	Std. Error of Cumulative Proportion Surviving at End of Interval	Probability Density	Std. Error of Probability Density	Hazard Rate	Std. Error of Hazard Rate
0	18645	1825	17733	54	0.0030	0.9970	0.9970	0.0004	.0005	.0001	0.0005	0.0001
6	16766	1939	15797	53	0.0034	0.9966	0.9936	0.0006	.0006	.0001	0.0006	0.0001
12	14774	1809	13870	76	0.0055	0.9945	0.9882	0.0009	.0009	.0001	0.0009	0.0001
18	12889	1678	12050	74	0.0061	0.9939	0.9821	0.0011	.0010	.0001	0.0010	0.0001
24	11137	1870	10202	79	0.0077	0.9923	0.9745	0.0014	.0013	.0001	0.0013	0.0001
30	9188	1645	8366	70	0.0084	0.9916	0.9663	0.0017	.0014	.0002	0.0014	0.0002
36	7473	1791	6578	94	0.0143	0.9857	0.9525	0.0022	.0023	.0002	0.0024	0.0002
42	5588	1697	4740	72	0.0152	0.9848	0.9381	0.0027	.0024	.0003	0.0026	0.0003
48	3819	1957	2841	89	0.0313	0.9687	0.9087	0.0041	.0049	.0005	0.0053	0.0006
54	1773	1680	933	93	0.0997	0.9003	0.8181	0.0096	.0151	.0015	0.0175	0.0018

a. The median survival time is 54.0000

From Table 2, it is noted that the survival function of under-five children in Indonesia is quite high, which is 0.997 between birth and six months of age. Furthermore, there is a monotonous pattern of survival decrease. At the age of 24 months, it holds a function of life at 0.992 and slightly falls to 0.97 at 48 months. This is in line with the estimated hazard function at those ages, which is around 0 between birth and 24 months of age and increases at the age of 30 months from 0.0014 to 0.018 at the age of 54 months. Thus, the hazard function shows that a toddler has a probability of 0.90 to survive after 54 months.

Figure 5: Survival and Hazard Curves of Under-Five Children in Indonesia, 2007



The table and the graph explain the cumulative survival pattern of under-five children in Indonesia. The pattern of survival of under-five children in Indonesia decreases monotonically as shown in Figure 5. The survival rates for children at the age of 0-12 months is 0.997, at the age of 42 months this decreases to approximately at 0.93, further decreasing to 0.90 at 48 months, and shows even more decline when reaching the age of 60 months, with the figure dropping as low as 0.82. A decline starts when toddlers' are aged more than 36 months. Overall, these curves indicate that children in Indonesia have a quite high probability to survive until the age of five.

4.4. Descriptive Results

Relationships between two variables can be expressed as a cross-tabulation between the dependent and independent variables. Thus, the frequency tables will answer the sub-questions of this study, which are "How is under-five survival in Indonesia?" and "What is the status of women in Indonesia?"

Table 3: Table of Frequencies, Cross Tabs, and Odds Ratio of Dependent and Independent Variables

Variables	Frequency	Percentage (%)	Binary child alive		Univariate regression	
			No (%)	Yes (%)	Odds Ratio	p-value
i. Women's status						**.000**
a. Low status	5,089	27.4	5.7	94.3	**Reference**	.000
b. High status	13,489	72.6	3.4	96.6	1.728	.000
1. Women's decision making						**.004**
a. Women decide alone	1,367	7.3	4.3	95.7	1.157	.037
b. Women and partners/other person	13,326	71.5	3.7	96.3	1.341	.001
c. Other people	3,365	21.2	6.0	94.0	**Reference**	.003
2. Women's education						**.000**
a. No education	797	4.3	6.5	93.5	**Reference**	.000
b. Primary	7,361	39.5	5.1	94.9	1.304	.083
c. Secondary	9,046	48.5	3.3	96.7	2.049	.000

Variables	Frequency	Percentage (%)	Binary child alive		Univariate regression	
			No (%)	Yes (%)	Odds Ratio	p-value
d. Higher	1,439	7.7	2.1	97.9	3.278	.000
e. Missing cases	2					
3. Women's employment status						**.162**
a. Not working	10,007	53.7	3.8	96.2	**Reference**	.209
b. Working	8573	46.0	4.3	95.7	.878	.080
c. Missing cases	65	0.3				
4. Income/Wealth Index						**.000**
a. Poorest	5,747	30.8	5.6	94.4	**Reference**	.000
b. Poorer	3,722	20.0	4.2	95.8	1.370	.002
c. Middle	3,229	17.3	3.4	96.6	1.689	.000
d. Richer	3,033	16.3	3.1	96.9	1.842	.000
e. Richest	2,914	15.6	2.4	97.6	2.385	.000
5. Interaction with the media						**.007**
a. Not at all	1,172	6.3	5.0	95.0	**Reference**	.036
b. Less than once a week	6,184	33.2	4.4	95.6	1.139	.376
c. At least once a week	8,601	46.1	3.7	96.3	1.367	.031
d. Almost everyday	2,688	14.4	3.7	96.3	1.386	.052
6. Age at first married	***Continuous variable***		***Average***	***19.92***	**1.032**	**.001**
7. Participation in family planning						**.000**
a. Not using	6,314	33.9	6.3	93.7	**Reference**	.000
b. Yes	12,331	66.1	2.9	97.1	2.263	.000
c. Community socioeconomic variables						
1. Place of residence						**.000**
a. Urban	7,013	37.6	3.0	97.0	**Reference**	.000
b. Rural	11,632	62.4	4.7	95.3	.638	.000
I. Direct factors						
i. Personal illness control variables						
1. Place of delivery						**.000**
a. Homes/other homes	10,995	59.0	4.2	95.8	**Reference**	.000
b. Hospital/other health care centre	7,650	41.0	3.8	96.2	1.097	.000
2. Antenatal care (Frequency of tetanus injections)	***Continuous variable***		***Average***	***2***	**1.892**	**.000**
3. Malaria prophylaxis						**.088**
a. No	11,804	63.3	4.8	95.2	**Reference**	.000
b. Yes	6,841	36.7	2.8	97.2	1.731	.000
c. Maternal variables						
1. Age of mother at childbearing	*Continuous variable*		*Average*	*27.67*	1.004	.053
2. Preceding birth interval (months)	*Continuous variable*		*Average*	*56.62*	1.004	.005
3. Parity	*Continuous variable*		*Average*	*2.74*	0.847	.000
d. Nutrient deficiency variables						
1. Duration of breastfeeding (months)	*Continuous variable*		*Average*	50.64	1.998	.015
2. Birth weight (grams)	*Continuous variable*		*Average*	4912.66	1.627	.000
Total N	**18,645**		**4.0**	**96.0**		

4.4.1. Women's Status

This part of the study will provide an answer to the following three questions: "What is the status of women in Indonesia?" "How does women's status affect the survival of under-five children?" and "What is its relation with under-five survival?"

The results show that most women in the study in the children's data file have high status, amounting to 72.6 percent, while low-status women are at 27.4 percent. This result shows that

women's status in Indonesia is quite high, because the percentage of women with high status is significantly higher than those with low status. Table 3 shows that under-five children from women with low status tend to have a survival rate that amounts to 94 percent, whereas almost 97 percent of under-five children survive when their mothers hold high status. Therefore, it can be taken as a conclusion that the high status of women leads to higher under-five survival.

From all the women's status variables, it can be seen that almost 80 percent of women participate in decision-making (71.5 percent decide with partners/others, 7.3 percent decide alone); only 21.2 percent have others to decide. Further, more than 95 percent of under-five children survive when women participate in family decision making, while 94 percent of under-five children survive when women do not. The cross-tab results also show that the lower percentages of under-five survival, which are equal to 93.5 and 94.9 percent respectively, are for women with either no education or primary school education, while higher child survival rates of more than 96 percent are experienced when women have an education at either secondary or higher level. In addition, the table results show that 56.2 percent of women have secondary or higher education. Meanwhile, 53.7 percent women do not work and have higher under-five survival, amounting to 96.2 percent, whilst 95 percent of under-five children survive when their mothers are unemployed.

Table 3 also shows that under-five survival is higher for the richest women, a figure that amounts to 97.6 percent, while this is only 94 percent for the poorest women. Therewith there are more than 50 percent women who live below the middle wealth index. The table also shows that more than 96 percent of under-five survival occurs when women interact with the media either at least once a week or almost every day, and slightly drops to 95 percent when women who do not interact with the media at all or less than once a week. The IDHS results show that more than 60 percent of women interact with the media almost every day, or at least once a week. More than 66 percent of women participate in a family planning program with 97.1 percent of under-five survival, while lower under-five survival, which amounts to 93 percent, is seen when women do not participate in a family planning program. In addition, the average age at first marriage for women in Indonesia is at 19.92 years old.

4.4.2. Other Determinants

Place of residence

The IDHS shows that 62.4 percent of women live in rural areas with 95 percent of under-five children survival, while the under-five survival percentage for urban areas is higher, amounting to 97 percent.

Place of delivery

It is evident from the results (Table 3) that 59 percent of under-five children were born at home/other homes. It is clearly shown that child survival is relatively lower when the child was delivered at home or in other homes (4.2 percent of children born do not survive) when comparing it to those born at proper health facilities and attended by professional doctors (only around 3 percent do not survive).

Malaria prophylaxis

The IDHS 2007 data results show that 63.3 percent of under-five children do not sleep under the bed net. The absence of the bed net accounts for 4.8 percent of all deaths in under-five children when suffering from serious malaria.

Maternal and Nutrient deficiency variables

Furthermore, since maternal and nutrient deficiencies consist of continuous variables, the results will be explained by taking an average. For maternal variables, the average age of childbearing is at 27.67 years old, and the preceding birth interval is 56.62 months. Further, the average parity is three children (2.74). Then for nutrient deficiency variables, 50.64 months is the average duration of breastfeeding and the average birth weight is 4,912 grams.

4.5. Results of Regression Analysis

4.5.1. Introduction

The first questions of this study have been answered in the first part of the data analysis; the rest of the study is dedicated to explaining the relationship that exists between each response variable and the dependant variable. The regression will show which variables have the significant effects and how its relation with under-five survival in Indonesia. Both women's status variables and other determinants will be analyzed.

4.5.2. Individual Effect of Independent Variables on Under-Five Survival

Univariate regression will allow us to select variables which are having significant effects on under-five survival in Indonesia and at the end of the analysis; the following research question will be answered: "What factors of women's status and other determinants have influence on under-five survival in Indonesia?"

Using SPSS 17, this part runs the comparison of category (procedure reference category) with the first menu option as the reference category. Each category of variables will be compared with the other category. Based on logistic regression output, a reference category for the explanatory variables will be established.

Women's Status Variables

The univariate model results show that women's status has a positive association on under-five survival (p-value<0.05; OR: 1.728). The regression shows that the composite variable of women's status is statistically significant with under-five survival. The univariate analysis results show that this variable has a positive relationship with under-five survival, which indicates that, higher women's status equals a higher rate of under-five survival. The odds ratio is 1.73, which means that women with a higher status have odds that are 1.73 times higher than those of women with low status of having under-five survival.

For each variable, the univariate analysis indicates that the variable for women's decision-making is significantly associated with under-five survival. Under-five children whose mothers participate in decision-making have odds to survive of 1.16 times when compared to women who do not participate in decision-making, as is shown in the univariate model and odds of 1.34 times to survive when women participate in family decision-making with their partners compared to those who do not participate at all.

Similarly with the decision-making, education is a very important factor in women's status and significantly affects under-five survival. The regression results show that the education variable is statistically significant and influences under-five survival with the highest odds ratio where children whose mothers with higher education have odds of 3.3 times to survive compared to children whose mothers had lower education.

The women's employment status variable is not statistically significant with under-five survival. Thus, the odds ratio shows a 12 percent decrease in the odds of under-five survival for women who work when compared to the reference category (do not work). The wealth index variable shows that it is significantly associated with child survival. The univariate regression shows that under-five children from the richest women have odds to survive of 2.4 times, when compared to the results for the poorest women.

The effect of interaction with the media is statistically significant in univariate regression as well. Univariate analysis reveals that the odds of under-five survival increase by 137 percent for women who interact with the media almost every day. The same thing goes for age at first marriage variable, which is also statistically significant. The regression results that log odds of under-five survival increase by 1.03 (additively) with each additional year of age at the first marriage of women. Like the others, the variable of participation in family planning has influence on under-five survival. The regression results show that this variable is statistically significant in the regression, with odds of under-five survival increasing by a multiplicative factor of 2.26 when women participate in family planning programs.

These results suggest that six of seven variables of women's status are statistically significant based on univariate regression analysis. The only variable that seems to be insignificant is women's employment status. However, that variable showed that the relationship with under-five survival is going in the expected direction.

Other Determinants

Place of residence

The univariate regression analysis results show that the place of residence is statistically significant and influences under-five survival. The odds of under-five survival decrease by a multiplicative factor of 0.63 outside of urban areas and shows that under-five survival in rural areas is lower than in urban areas.

Personal illness control variables

Personal illness variables have three variables, which are the place of delivery, antenatal care, and malaria prophylaxis. The univariate model results show that the place of delivery is statistically significant. The regression shows that the odds of children who are born in health care facilities to survive is 1.1 times as high as for children who are born at home/other homes. Univariate regression results also show that antenatal care is associated with under-five survival. The regression found that women who received more injections before delivery are more likely to experience under-five survival. The odds of under-five children to survive for women who received injections before delivery are 1.89 times higher than those who did not receive injections. Contrarily, the univariate analysis shows that the variable of malaria prophylaxis is insignificantly associated with under-five survival at the level of 0.05 *(p-value 0.088)*, even though the relationship with under-five survival is going in the expected direction, with odds of survival 1.73 times when children sleep under the bed net.

Maternal variables

The univariate regression should have shown that the age of women at childbearing has a strong association on under-five survival. Surprisingly, in this study the effect of the childbearing age is statistically insignificant in univariate regression *(p-value 0.053)*. However, the odds of surviving in each category of childbearing age show an increase of approximately 100.4 percent with each additional year of age of childbearing in the univariate model. Thus, the univariate analysis found that under-five survival is more likely to happen when women deliver babies at older ages. Meanwhile, the birth interval is also positively associated with under-five survival. The outcome of the univariate analysis shows that the odds ratio of survival increases by a multiplicative factor of 1.004 with each additional month of birth interval. The univariate result also shows that variable parity is statistically

significant in association with under-five survival. The result presents a 16 percent decrease in the odds of under-five survival for women who have a higher number of children.

Nutrient deficiency variables

The univariate results show that the effect of breastfeeding duration is quite high on under-five survival. The analysis shows that under-five children who breastfeed from their mothers have significantly higher odds of survival, 1.998 times higher, when compared to those children who were not breastfed. Similarly, the univariate analysis also shows that birth weight has a strong relationship with under-five survival. The odds of survival increase by 1.627 times (additively) with each additional gram of birth weight.

4.5.3. Multivariate Analysis (Final Model with Interaction Effect)

Based on the research questions and the framework established in Chapter III, a model will be created to see the influences of explanatory variables of women's status, women's status itself, and other variables simultaneously on the response variable of under-five survival. This analysis will see whether variable women's status still remains significant associates with under-five survival as in univariate analysis when other determinants are included in the model. Thus, this will answer the main research questions; "How does women's status effect the survival of under-five survival and what is its relation with under-five survival?" and "What is the influence of women's status in the determination of under-five survival together with other determinants in Indonesia?"

Before running the analysis, multicollinearity is done to test the assumptions of deviations in the regression. Two multicollinearity tests are run in accordance with the research questions. The first one includes variables that form women's status and women's status itself with other determinants. The second one is women's status and other determinants. From the calculations, which were done using SPSS 17, the first test results women's status variable is removed from the model if seven variables of women's status are included. This might happen because variable women's status is built by combination of those seven variables. The second multicollinearity test results ensure that the variance inflation factor (VIF) of women's status and other determinants is not greater than 5 and that the tolerance values are greater than 0.05 which shows among independent variables, then the multicollinearity problem does not occur as shown in Table 5 *(Appendix)*.

Hereafter, the logistic regression analysis can be done. The significance level used in the model and significance test of coefficients is 5%. If the significance level in the model is smaller or equal to 5%, then the model is accurate. In the test of significance, if the significance level of coefficient variables is smaller or equal to 5%, then the influential variables are significant to the model. Further, the odds ratio is used to explain how likely it is that independent variables contribute to under-five survival.

Women's status variables

The logistic regression model results show that seven explanatory variables of women's status can simultaneously be used to explain the tendency of under-five survival. This case can be proven by comparing the significance table (p-value) with α, a value that is equal to 0.05.

Table 4: Association of Women Status Variables on Under-Five Survival Model

Variables	*Coefficients B*	*S.E.*	*Wald*	*Exp(B)*	*Significance*
Decision making					
Others	Reference		6.147		.046*
Women with partners	.799	.088	5.282	2.223	.022*
Women decide alone	.839	.154	3.183	2.315	.074**
Highest education level					
No education	Reference		5.963		.020*
Primary	.648	.733	.733	1.912	.037*
Secondary	.177	.760	.054	1.193	.008*
Higher	3.040	1.416	4.609	20.910	.032*
Working status					
Do not work	Reference		.028		.986
Currently working	-.053	.314	.028	.948	.866
Wealth index					
Poorest	Reference		19.194		.001*
Poorer	.216	.104	4.298	1.242	.038*
Middle	.359	.120	8.905	1.432	.003*
Richer	.395	.131	9.039	1.485	.003*
Richest	.573	.154	13.862	1.774	.000*
Interaction with media					
Not at all	Reference		10.110		.018*
Less than once a week	-.232	.155	2.252	.793	.133
Less than once a week	-.353	.161	4.830	.703	.028*
Almost everyday	-.563	.189	8.863	.570	.003*
Age at first married	.016	.037	.201	1.017	.654
Family planning participation					
Do not use contraceptive	Reference				
Use contraceptive	.763	.077	98.213	2.144	.000*
Interaction education by working status					
No education by do not work			.728		.998
Primary by work	-.098	.331	.088	.905	.767
Secondary by work	-.110	.336	.107	.896	.743
Higher by work	.132	.516	.066	1.141	.798
Interaction education by age at first married					
Age at first married by no education			6.493		.090**
Age at first married by primary	-.026	.039	.433	.975	.510
Age at first married by secondary	.014	.040	.115	1.014	.734

Variables	*Coefficients B*	*S.E.*	*Wald*	*Exp(B)*	*Significance*
Age at first married by higher	-.094	.060	2.435	.910	.119
Constant	*2.078*	*.695*	*8.942*	*7.986*	*.003**

*significance for p-value < 0.05 **significant for p-value < 0.10

Table 4 shows that five of seven variables of women's status are statistically significant on under-five survival in the regression analysis. The logistic regression model results indicate that women's decision-making, education, wealth index, interaction with the media, and participation in family planning are all strongly associated with under-five survival. The odds of survival are highest when looking at the variable of education, which shows that under-five children have odds 20.90 times higher to survive when women have higher education. Under-five survival is also more likely to happen when women decide alone in family decision-making, with odds 2.32 higher of children surviving, when compared to women who do not participate in decision-making. Children of richest women also have odds 1.77 times higher to survive when compared to poorest women and under-five survival is higher as well for women who use contraceptives with the odds 2.14 times higher than when women do not use contraception. In contrast with the previous result from univariate analysis, interaction with the media has a negative relationship with under-five survival, with the odds of survival decreasing by 43 percent for women who interact with media more frequently.

As in the univariate analysis, the variable of working status is not statistically significant at the level of 0.05 in the multivariate regression as well as age at first marriage. This result shows that when these two variables are added to a combined effect model, they become insignificant. The regression also added interaction effects between women's level of education with their employment status and age at first marriage. Unfortunately, the results are still insignificant for the interactions in the model.

Further, to determine whether the variable of women's status variable itself is significant when the other variables are entered into the model simultaneously, the significance test model is used to determine the effects of the whole explanatory variables in the model together (simultaneously). The hypothesis that is used in the model is:

H0: There is no relationship between the explanatory variables and the response variable

H1: At least one explanatory variable affects the response variable

A classification model is used to determine the suitability of the model in predicting whether under-five children are alive or dead, which shows when there is a bigger overall value, leading to the model that is used to make the prediction improving. In the logistic regression analysis, the output yields a 99 percent survival rate. That means the model used to predict under-five survival rate measures is very good. After that, the calculation results of the logistic regression are compared with

the established p-value and a model is obtained, then H0 will be rejected if the statistical significance value is more than 0.05.

Table 5: Association of Women's Status and Other Determinants (Final Model)

Variables	*Coefficients B*	*S.E.*	*Wald*	*Exp(B)*	*Significance*
Women status					
Low status	**Reference**				
High status	.500	.023	4.739	1.645	.029*
Community socioeconomic variable (Place of residence)					
Urban	**Reference**				
Rural	1.699	1.144	2.206	5.469	.137
Personal illness control					
Place of delivery					
Homes/other homes	**Reference**				
Hospital/other health centres	.008	.008	1.071	1.008	.030*
Antenatal care (total tetanus injections)	*.144*	*.049*	*8.557*	*1.155*	*.003**
Malaria prophylaxis					
Children didn't sleep under bed net	**Reference**				
Children slept under bed net	.013	.093	.019	1.013	.089**
Maternal variables					
Childbearing age	.002	.161	.000	1.002	.098**
Preceding birth interval	.021	.005	20.173	1.021	.000*
Parity	-.157	.074	4.449	.855	.035*
Nutrient deficiency variables					
Duration of breastfeeding	*.007*	*.003*	*8.151*	*1.007*	*.004**
Birth weight	*.077*	*.102*	*.576*	*1.080*	*.044**
Interaction					
Women status by place of residence	-.022	.013	3.116	.978	.078**
Constant	*1.921*	*1.205*	*2.540*	*6.828*	*.011**

*significant at p-value < 0.05 ** significant at p-value < 0.1

The table gives information on the existing effect of women's status variable and other indirect and direct determinants that contribute to under-five survival in Indonesia. Given that the criterion used to judge the significance level of variables is 0.05, the women's status variable that is entered into the model is statistically significant as in univariate model, while some other variables are statistically insignificant, such as place of residence, malaria prophylaxis, and childbearing age. The regression shows that women's status is positively associated with under-five survival when other determinants simultaneously entered into the model. The odds of under-five survival are 1.645 times higher for children of women with high status. Place of delivery and antenatal care are strongly associated with under-five survival with the odds of 1.008 and 1.155 respectively for children born at hospital/other health centres and for women have tetanus injections before delivery. Birth interval and parity are significant as well and have odds ratio increases of 104.12 percent with each additional month of birth interval but shows a decrease of 15 percent with each additional child ever born. Like the others, duration of breastfeeding is statistically significant in the model and increases odds of under-five survival by a multiplicative factor of 1.007 (additively) with increased duration of

breastfeeding. Furthermore, birth weight is also significant with an increase of 108 percent in the odds of survival with each additional gram of birth weight.

Although a few variables are not significant, the effects are in the expected direction, such as malaria prophylaxis and childbearing age. Multivariate regression shows that under-five children who sleep under the bed net have higher log-odds, which shows an increase of 1.013 times. Childbearing age also leads to higher odds of under-five survival, with odds increasing by a multiplicative factor of 1.002 with each additional year of childbearing age. In contrast, place of residence variable is different from univariate analysis and not going in the expected direction like other insignificant variables. Multivariate shows increasing log-odds of survival, which are 5.47 higher for children in rural areas.

The multivariate regression also includes interaction between place of residence and women's status in the model that results show are insignificant at the level of 0.05 (p-value 0.078), which means this interaction does not have an influence on the selection of counter measures for under-five survival.

The multivariate analysis results show that three variables are not significant in the model. These results are different from univariate analysis. This might have happened due to the inclusion of other variables into the model simultaneously. Although they have different percentages that are relatively significant in the descriptive analysis, they are not significant in the multivariate logistic regression model. A possible explanation for the non-significance is as follows: when there are variables that were entered into the model in the multivariate logistic regression analysis, the other variables were held constant, while in the descriptive analysis, cross-tabulations, and univariate analysis were conducted between each explanatory variable on the response variable, so even if the variables have different percentages, they may not be included in the multivariate regression model, nor vice versa, as this analysis mainly dealt with the enter method procedure along the analysis.

CHAPTER V CONCLUSION AND DISCUSSIONS

5.1. Conclusions

To understand the major findings and summary of the study, the results will be discussed separately in accordance with the objective of the study and under each research question.

The general objective was to examine the association between women's status and under-five survival in Indonesia.

The main research question: What is the influence of women's status in the determination of under-five survival together with other determinants in Indonesia?

The univariate and multivariate regressions results show that there is an association between women's status and under-five survival; it is shown that there is a strong relationship between women's status and under-five survival. Thus, the odds ratio shows that under-five survival increases for women with high status.

Sub research question 1. What is the rate of under-five survival in Indonesia?

The first research question was answered by descriptive statistics based on frequencies and cross-tabs that were collected from the 18.645 children aged under-five of the 2002 – 2007 birth cohorts. In this study, 96 percent survived at least until the period of interview. This result indicates that under-five survival in Indonesia is quite high.

What are the under-five survival probability and its pattern in Indonesia?

The Life Table results show that under-five children have a probability of survival until the age of 60 months of 0.90. Furthermore, probability of survival at the infancy period (less than one year) was estimated to be about 0.997 and will decline until the age of 60 months. In addition, the Kaplan Meier result shows that the cumulative probability of under-five child survival is 0.82.

Sub research question 2. What is the status of women in Indonesia?

Most women in Indonesia have high status, which amounts to 72.6 percent of the women in the survey. This can be seen clearly from education and interaction with the media, which all have been quite high. As for the participation in decision-making and the use of contraceptives, these are very high. Most women have followed the family planning program and that program is becoming known and used by most of society, especially women.

Sub research question 3. How does women's status affect the survival of their under-five children?

The regression presents that the composite variable of women's status is statistically significant affect under-five survival. The univariate regression results show that this variable has a

positive relationship with under-five survival, which indicates that, the higher status of women, the higher under-five survival. The odds ratio is 1.73, which means that women with a higher status have odds that are 1.73 times higher than those of women with low status of having under-five survival. Similarly in multivariate analysis when other determinants simultaneously included into the model, women's status has significantly positive association with under-five survival with the odds increases by 1.65 times for women hold high status.

Sub research question 4. What factors from women's status influence under-five survival in Indonesia?

Based on the univariate and multivariate regression, women's participation in decision-making is associated with under-five survival and influences the risk for the survival chances of under-five children. Furthermore, higher education had a positive impact on under-five survival suggesting that education is an important component that may affect under-five survival, which means that under-five survival is higher for more educated women. Wealth index also has a significant effect on under-five survival, where the odds of survival increase as women's wealth increases. Similarly, the family planning program has a positive impact on under-five survival, meaning that odds of survival increases for women who followed planning programs. The interaction with the media variable also has a significant effect on under-five survival, but the multivariate regression results show a negative sign for this variable. Surprisingly, the variables of employment status and age at first marriage were statistically not significant in the multivariate regression. Meanwhile, the multivariate regression results show that the interaction effect between women's level of education with employment status and age at first marriage are not significant at the level of 0.05.

Sub research question 5. How do other determinants influence under-five survival with women's status entered in the model?

The multivariate analysis results show that place of delivery, antenatal care, birth interval, parity, breastfeeding, and birth weight are significantly associated with under-five survival. Meanwhile, place of residence, malaria prophylaxis, and childbearing age are not statistically significantly associated when women's status is included in the multivariate model. However, these variables showed the expected directions of association with under-five survival except place of residence variable.

5.2. Discussion of The Results

The purpose of this study is to understand the mechanism of how women's status affects under-five survival with other determinants involved in the model. The significance of women's status does not lie in simply a listing of the multiplicity of variables of interest or in concerns with scaling and measurement of variables within. Rather, the key advantage of the model lies in the organization

of seemingly disparate measures of women's status and other proximate determinants into a coherent framework in which they are linked to one another on the one hand and to child survival on the other.

Nevertheless, some findings were noted that were surprising for this study, such as the insignificance of women's employment status on under-five survival. The possible explanation for this result is that the variable had some missing cases, which affected the numbers in the sample size, which in turn could have an influence on the results. Furthermore, the interaction with the media variable is significant, but has a negative sign in the model. This might suggest that interacting with television, radio, and newspapers is apparently not a useful source of information on raising healthy children and promoting child health. A direct and personal approach to women in Indonesia is more effective than the media.

Thus, among other women's status variables, decision-making, education, wealth index, age at first marriage, and participation in family planning programs have significant associations with under-five survival. The most important variables with the highest odds ratio of under-five survival are education and women's decision-making. These variables indicate the actual position of women within the family, so in some ways women who tend to have autonomy and freedom are more involved in their families, including the terms of child survival.

The multivariate analysis, which includes women's status, added in the model with other determinants, shows that there is no significant association between place of residence, malaria prophylaxis, and childbearing age. However, they are going in the expected directions in their relationship, except for place of residence. The inverted parabolic model could be the reason why childbearing age variable is not significant because basically under-five survival decreases as childbearing age increases. The fact is that under-five children would have greater probability to die when women bear them at older ages. Another finding is that there is lower child survival in urban areas when compared to rural areas. This might happen because there are a lot of urban migrants, a group that has been growing rapidly in Indonesia. There are many children born to urban migrants who are poor, which might explain why these urban migrants have no access to provisional health care services.

5.3. Recommendations

The recommendations based on the results of this study are as follows:

1. The results provide information that there is a strong association between the variables of women's status and under-five survival, so when one variable is improved, others are also affected, as they are related to each other on multiple levels.

2. In recognising different levels of determinants that affect child survival, interventions are needed to those that address proximate determinants and increase women's status to increase the children's health.
3. Further research might then be able to look at the status of women in a more complex manner. In addition, it would be interesting to see whether the status of women is associated with other demographic components, such as fertility, or by comparing some of the regional areas in the country; so that it can show the differences in how the status of women influences under-five survival. Furthermore, the interactions between proximate determinants and women's status are also expected to be applied and developed in the future.
4. In this study, employment status is just operationalized generally, which resulted insignificant association with under-five survival, it is expected to be able to explore the employment status specifically in further research, for example, the criteria for blue collar workers and white collar workers, so that women's status in terms of employment can be more clearly differentiated.
5. The theoretical model implies an approach of looking at child mortality specifically by studying its association with women's status in terms of their behaviours. Future use of the model should facilitate the possibility of including women's perception such as perceptions of getting medical advice or treatment for their children.
6. The results of this study can be used as one review in order to improve the status of women and under-five survival in Indonesia, starting from the family environment and can further be developed to fit the entire community.
7. High under-five survival in an area may actually indicate that women's status has been good enough. The results of this study can serve as information and consideration for the government or other institutions in Indonesia on whether the status of women still needs to be improved in order to empower women to support the creation of prosperous families. It is expected that the increased status of women will have an impact on the decline of under-five mortality in Indonesia.
8. Empowerment of women in Indonesia should be immediately realized as the increasing of women's status not only helps decrease under-five mortality, but it is also expected that a good mother's condition can guarantee a high quality of the next generation. The condition of children is strongly influenced by the condition of women since the time of pregnancy until birth and then in their development.

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APPENDIX

Table 6: Multicollinearity Test of All Independent Variables

Variables	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig.*	*Collinearity Statistics*	
	B	***Std. Error***	***Beta***			***Tolerance***	***VIF***
(Constant)	*.990*	*.010*		*97.385*	*.000*		
Women's Status Variables							
Decision making	.001	.002	.005	.461	.645	.989	1.012
Highest educational level	-.878	.002	.000	-.050	.960	.653	1.532
Working status	-.003	.001	-.023	-2.253	.024	.974	1.027
Wealth index	.002	.001	.032	2.256	.024	.491	2.036
Interaction with media	.000	.000	-.010	-.854	.393	.780	1.282
Age at first marriage	.000	.000	.013	.832	.405	.417	2.398
Contraceptive use	.001	.000	.026	2.597	.009	.985	1.016
Community Socioeconomic							
Type of place of residence	.000	.003	-.002	-.133	.894	.645	1.552
Personal Illness Control							
Place of delivery	.000	.000	-.014	-1.218	.223	.756	1.323
Antenatal care	-.002	.001	-.028	-2.827	.005	.972	1.029
Malaria prophylaxis	.000	.001	-.005	-.498	.618	.899	1.113
Maternal Variables							
Childbearing age	-.416	.000	-.002	-.118	.906	.244	4.106
Preceding birth interval	.000	.000	.048	3.399	.001	.495	2.020
Total children ever born	-.002	.001	-.036	-2.052	.040	.310	3.226
Nutrient Deficiency							
Duration of breastfeeding	.696	.000	.027	2.694	.007	.972	1.029
Size of child at birth	-.003	.001	-.043	-4.198	.000	.951	1.052

a. Dependent Variable: child is alive

Excluded Variables[b]

	Model	*Beta In*	*t*	*Sig.*	*Partial Correlation*	*Collinearity Statistics*		
						Tolerance	***VIF***	***Minimum Tolerance***
1	Women's status	.[a]	.	.	.	.000	.	.000

a. Predictors in the Model: (Constant), size of child at birth, children under 5 slept under bed net last night (hh report), tetanus injections before birth, decisionmaking, respondent currently working, current contraceptive method, preceding birth interval, duration of breastfeeding, total children ever born, media, age at first marriage, place of delivery, type of place of residence, highest educational level, wealth index, childbear

b. Dependent Variable: child is alive

Table 7: Multicollinearity Test of Women's Status and Other Determinants

Variables	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig.*	*Collinearity Statistics*	
	B	***Std. Error***	***Beta***			***Tolerance***	***VIF***
(Constant)	*.994*	*.010*		*103.041*	*.000*		
Women's status	**.939**	**.000**	**.018**	**1.339**	**.181**	**.568**	**1.762**
Socio Economic Variable							
Type of place of residence	-.002	.002	-.011	-.980	.327	.738	1.355
Personal Illness Control							
Place of delivery	-.792	.000	-.009	-.839	.401	.784	1.276
Antenatal care	-.002	.001	-.029	-2.895	.004	.977	1.024
Malaria prophylaxis	.000	.001	-.001	-.141	.888	.915	1.092
Maternal Variables							
Childbearing age	.783	.000	.004	.280	.780	.387	2.586
Preceding birth interval	.000	.000	.046	3.860	.000	.678	1.474
Total children ever born	-.003	.001	-.043	-2.875	.004	.430	2.325
Nutrient Deficiency							
Duration of breastfeeding	.725	.000	.028	2.815	.005	.977	1.023
Size of child at birth	-.003	.001	-.043	-4.255	.000	.960	1.042

a. Dependent Variable: child is alive