Chapter III

Research Methodology

This chapter explains about the data being used and the methodology for the research.

3.1 Data

This research is using a cross-section data acquired from The Demographic and Health Surveys Program for Indonesia year 2012 (IDHS 2012) which provides us data on fertility, family planning, maternal and child health, adult mortality, and awareness of AIDS. IDHS 2012 is the seventh survey conducted, the previous one conducted on 2007. One of the objectives of this survey that are related to our research is children's health that becomes a special focus to evaluate the achievement of goals previously set by national health program. The survey was accomplished by Statistics Agency of Indonesia (BPS) together with the National Population and Family Planning Board (BKKBN) and the Ministry of Health Republic of Indonesia (*Kemenkes*). IDHS 2012 was conducted on 33 provinces with 46,024 household in Indonesia.

Respondents who were eligible to participate are married women age 15-49 and married men age 15-54, their records proceeded into standard DHS datasets. Special DHS datasets are not included in this research because the respondents who were eligible to participate are never married women and never married men. Standard IDHS datasets consist of seven data: all births, couples, households,

women, children, men, and people. Care has been taken to include the variables that are deemed important for each of these files to help user analysis without merging datasets. For example, variables for household characteristics are included in the women, men, and children's files.

A household is defined as persons who usually live together in the same housing unit and have common cooking and eating arrangements, and who acknowledge one adult member as the head (of the household). A member of the household is any person who usually lives in the household. Children below five years old had been represented by their mothers who lived with them. In this research we use household characteristics and mother characteristics then combined them with children characteristics information taken from IDKR63FL (Statistics Indonesia (Badan Pusat Statistik [BPS]), National Population and Family Planning Board (BKKBN), Indonesia Ministry of Health (Depkes RI), & ICF International, 2013).

3.2 Econometric Models

The models used in this research referring to the previous researches from Pillai et al. (2003), Ogunlesi & Olanrewaju (2010) and Chowdhury et al. (2015) where the choice for treatment is associated with social and economic variables. Three models used to see the stability of independent variables, also to find the best suitable form of model to estimate its effect to the decision of choosing treatment on children diarrhea. The written expression of the model is taken from Cameron & Trivedi (2005)

The first model refer to Pillai et al (2003). Originally it has many variables, but the data that are used in this research only contain some of them which is the following formula:

$$\Pr(treatment = 1)$$
$$= \Lambda(\beta_0 + \delta_0 age_i + \delta_1 sex_i + \delta_2 rural_i + \delta_3 wealth_i$$
$$+ \delta_4 mother_{education_i} + \varepsilon_i)$$

Adding more variables from Chowdhury et al. (2015), the second model is explained as:

$$\Pr(treatment = 1)$$
$$= \Lambda(\beta_0 + \delta_0 age_i + \delta_1 sex_i + \delta_2 rural_i + \delta_3 wealth_i$$
$$+ \delta_4 mother_{education_i} + \delta_5 toilet_i + \delta_6 water_{treatment_i}$$
$$+ \delta_7 water_{source_i} + \varepsilon_i)$$

The third model adding more variables refers to Ogunlesi & Olanrewaju (2010). The model is explained below:

$$\Pr(treatment = 1)$$
$$= \Lambda(\beta_0 + \delta_0 age_i + \delta_1 sex_i + \delta_2 rural_i + \delta_3 wealth_i$$
$$+ \delta_4 mother_{education_i} + \delta_5 toilet_i + \delta_6 water_{treatment_i}$$
$$+ \delta_7 water_{source_i} + \delta_8 only_{child_i} + \beta_1 mother_{age_i} + \varepsilon_i)$$

3.2.1 Dependent Variable

Treatment is described as mothers whose children were having diarrhea episode within two weeks prior the interview who sought medical treatment or non-

medical treatment. Non-medical treatment includes no treatment sought during the episode. Suffered from diarrhea episode within two weeks are acute persistent diarrhea (WHO, 2005). Treatment is constructed from three variable h12z (children receive medical treatment) and h11 (children suffer diarrhea within the past two weeks prior the interview) in children below 5 years old datasets. Treatment is coded 1 if the children with diarrhea got medical treatment, and 0 if no medical treatment. Diarrhea with blood on stools is not included on the research because it indicates another disease that might need another treatment than diarrhea without blood (Statistics Agency of Indonesia (Badan Pusat Statistik [BPS]), 2013)

3.2.2 Independent Variables

The independent variables used in this research are listed as follows:

1. Age

    This variable is a dummy variable that provide information of children age in month. It is coded one for children with age less than and equal to 24 months. It is coded zero for children with age more than 24 months. This classification is used because eight of 10 of death caused by diarrhea occur in happened in the first two years of life according to Subagyo and Santoso on IDAI (2009) most of diarrhea episodes occur in the first two years of children's lives.

2. Gender

    This variable is a dummy variable that provides information of children's gender. It is coded one for female and zero for male.

3. Rural

This variable is a dummy variable that provides information about type of the place of residence. It is coded zero for urban and one for rural area.

4. Wealth

This variable is a dummy variable that provide information for household wealth measured with standard recode manual, a standard operational guideline, made by Demographic Health Survey. Wealth index is a measure of a household cumulative living standard (The DHS Program - Wealth Index Construction, 2018)(*Demographic and Health Surveys Methodology*, 2013). It is coded zero for poorest, poorer, and middle meanwhile one for richer, and richest.

5. Mother's Education

This dummy variable provides us the information on the highest education level attended by mothers. It coded zero no education, primary meanwhile one for higher education.

6. Toilet

This variable is a dummy variable that provides information on toilet sanitation. It is coded one for non-sanitary toilet facility, and zero for sanitary toilet facility the classification follows WHO Sanitary webpage which classified as toilet without septic tank, shared/ public, pit latrine, yard/ bush/ forest, river/ stream/ creek, and other (WHO, 2016) and (Statistics Indonesia (Badan Pusat Statistik [BPS]), 2013).

7. Source of Drinking Water

This variable is a dummy variable that provides information on safe drinking water source. It is coded one for safe source of drinking water which classified into piped to dwelling, piped to yard/ plot, bottle water, and refill water. Zero for non-safe source of drinking water.

8. Treated Drinking Water

This variable is a dummy variable that provide information of any treatment given to the water prior to consumption. It is coded one as giving treatment by boiling, adding bleach, strain through cloth, water filter, and giving solar disinfection. Zero for not giving any treatment to the water.

9. Only Child

This variable is a dummy variable that provide information whether the child is the only child in the household. It is coded one if there are only one child in the household and zero if there are other children.

10. Mother's Age

This variable provides information of mother's age in years.

3.3 Estimation & Analysis

This research uses logistic regression to see the effect of social and economic variables to the decision of choosing medical treatment and non-medical treatment for children with diarrhea. Logistic estimation is also used due to the aspect of the binary dependent variable. Analysis is conducted using Stata 13.