The Utilization of Maternal Health Care by Pregnant Women with Complication: An Analysis of Enabling Component Based on the 2002-2003 IDHS

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Abstract. *This study aims to find factors that influence utilization of maternal health care by pregnant women with complication using the results of the 2002-2003 Indonesia Demographic and Health Survey. Factor analyzed are women's empowerment, husband's involvement, women's knowledge on health care and socioeconomic conditions. By applying logistic regression and using 10 independent variables to represent those factors, this study reveals that husband's education, husband's companionship for antenatal care (ANC) visits, women's knowledge about danger signs of pregnancy complications, and women's involvement in decision making significantly influence the utilization of maternal health care. Husband's support in ANC was found as the strongest factor of women's health seeking behavior during pregnancy followed by husband's education, women's involvement in decision making, and women's knowledge about danger signs of pregnancy complications. Therefore, any intervention program aimed at improving maternal health in Indonesia should address the issues related to the four aspects mentioned above.*

Keywords: Pregnant women, complication, maternal care, health seeking behavior, Indonesia.

1. BACKGROUND

Because of their obvious role in human reproduction, women bear the brunt of most reproductive morbidity and mortality. One of the major components of reproductive mortality in the developing countries is maternal mortality, which is defined by the World Health Organization (WHO) as

"death while pregnant or within 42 days of the termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes" (Pison, 2001, p. 3).

That maternal death is one of the biggest problems in reproductive health is demonstrated by the fact that an estimated of 529,000 women die per year in the world from maternal causes. In other words, this is equivalent to one maternal death every minute. Of these maternal deaths, 99 percent occur in the developing countries where the lifetime risk of maternal death (at 1 in 61) is nearly 46 times higher than that in developed countries (at 1 in 2,800) (UNFPA, 2004, pp. 51-52). Lifetime risk of maternal death (LTR) is one indicator showing the probability of dying of pregnancy related causes by the end of reproductive period. The LTR is calculated by using the maternal mortality ratio (MMR) and total fertility rate (TFR). LTR usually is represented as odds such as 1 in 61 which means one in every 61 women will die because of pregnancy related diseases.

Indonesia as a developing country also has high maternal mortality. Estimate from the 1997 Indonesia Demographic and Health Survey (IDHS) shows an MMR of 334 per 100,000 live births for Indonesia (BPS, et al., 2004). Estimates from the 2002-2003 show an MMR of 307 per 100,000 live births (BPS, et al., 2004). According to other estimates, such as those from the WHO, the United Nations Children and Education Fund (UNICEF), and the United Funds for Population Activities (UNFPA), the MMR in Indonesia 1990, 1995, and 2000 were 650, 472, and 230 per 100,000 live births respectively (Ross, 2003). All of these estimations show that although MMR in Indonesia has declined, it is still very high, especially if it is compared with others countries of the Association of Southeast Asian Nations (ASEAN). Therefore, maternal mortality is rightfully a matter of great concern of the Indonesian government, which has set itself the ambitious target of reducing it to 125 per 100,000 live births by 2010 (Thind & Banerjee, 2004, p. 285).

Daly and Saadah (1999, p. 1) state that the leading causes of death and disability among women of reproductive ages in Indonesia are complications of pregnancy and childbirth. Most of the causes of death such as haemorrhage, postpartum sepsis, and hypertensive disease of pregnancy are preventable. Therefore the most effective intervention to reduce the MMR is to give the right treatment for women with complications during pregnancy and delivery. This situation is not different from that prevailing in other developing countries in which 80 percent of maternal deaths are due to direct obstetric complications like

haemorrhage, sepsis, complications of abortion, pre-eclampsia, eclampsia, and prolonged/obstructed labor (UNFPA, 2004, p. 53).

Unfortunately the majority of women do not obtain appropriate treatment during pregnancy or delivery. Based on IDHS 2002-03, almost a half (48%) of pregnant women who suffered from premature labor reported that they took no action to overcome the complication (BPS, et al., 2004, p. 125). Taking medications is the most popular action taken to overcome excessive bleeding during pregnancy. More than two thirds of the pregnant women with excessive bleeding took this action. On the other hand only about 15 percent of women who suffered excessive bleeding saw a midwife or a doctor for help. Therefore this study is aimed to identify the factors that are responsible for the low utilization of maternal health care, especially among pregnant women with complications.

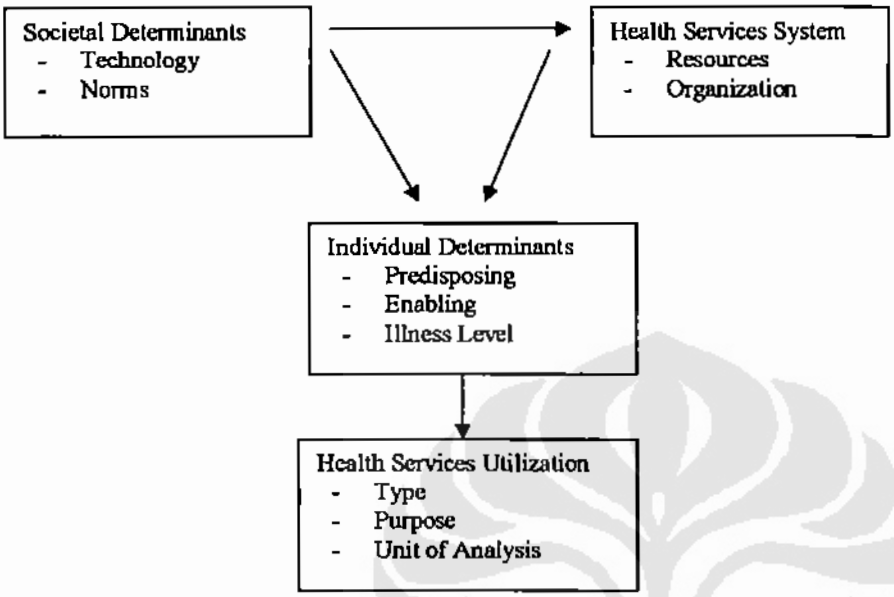
2. LITERATURE REVIEW

In order to comprehend health seeking behavior, Andersen and Newman (1973, p. 98) presented a theoretical framework (see Figure 1). This framework shows that societal factors and health service systems influence individuals to use health services. In this case health services are described as modern health care services. Societal factors can be described by technology and norms that exist in the community. Sometimes norms which are implemented in a society can become a hindrance to using health care services, especially when the norms relate to traditional beliefs. This condition usually occurs in a traditional society. In a modern society where advanced technology has been adapted traditional beliefs and methods are expected to diminish in importance. The technology that exists in a community has an influence on the society's health care system. The health service system influences individual behavior through the availability of resources and organization. The availability of resources or facilities is not the only aspect of the health system that affects health services utilization, but it is the distribution of those resources which affects health care utilization. Provision of health service facilities at the right places ensures better accessibility and reduces difficulties and reluctance of community members to use health services. In addition, an effective and efficient organization of health services acts as an important factor to encourage the population to use health services.

Societal factors and health services system can be regarded as external factors that influence individual health behavior that act through the group of intermediate variables defined as individual determinants. The individual determinants can be categorized into three components: Predisposing Component, Enabling Component and Illness Level

Component. The Predisposing Component consists of characteristic that create different propensity to use health care services, while the Enabling Component acts as a means to obtain treatments. In the absence of enabling factors a person can not use health services even though he/she is predisposed towards using health services. Furthermore, an illness must exist as a reason to seek health care.

Figure 1
FRAMEWORK FOR VIEWING HEALTH SERVICES UTILIZATION



Source: Andersen and Newman (1973, p. 98).

The Enabling Component consists of variables that can facilitate an individual to use health care services. It can be represented by individual, household or community conditions. Economic condition is usually described by income but household condition such as availability of durable goods, type of toilet, water supply, type of floor/wall/ roof and so on can also represent wealth of the household (Hamid, 1994, p. 14). Sometimes, monthly consumption per capita is used to describe the economic condition because data about income are difficult to collect. However, consumption or expenditure represents disposable income. Better economic condition provides higher capability to use health care service through higher purchasing power because in some cases much money is needed to get treatment. The existence of health insurance may reduce the role of cash money to obtain treatment, but health insurance in Indonesia covers only a very small proportion of the population.

Besides, accessibility to health care facilities is also crucial for enabling individuals using health care services. Accessibility can be grouped into two different categories (Andersen & Newman, 1973, pp.100-1): (i) physical condition of health care centers such as the distance length to the health care centre, the time spent to reach medical care services, and the money needed for transportations; and (ii) the structure and organization of health care services, which influence individual satisfaction leading to individual preference for health care seeking behavior. The individual satisfaction is determined by the ability of health care services submit the individual's needs. The main aim of the individual to go to medical services is to obtain treatment. Unfortunately, sometimes the right treatment can not be obtained because of some reasons such the absence of qualified health care personnel, unavailability of specific treatment or the need to perform complex procedures that have long queues.

There are some examples which show the significance of the Enabling Component to influence health care seeking behavior. In Bangladesh, the husband's occupation is one enabling variable which significantly influences maternal health care seeking behavior (Chakraborty, et al., 2003, p. 333). The wives of men who work in business or services are more likely to find treatment from doctors or nurses compared to wives of farmers. In Turkey health insurance and household wealth, as defined by car ownership, type of floor and type of toilet are positively associated with the use of prenatal care (Celik, & Hotchkiss 2000, p. 1802). Car ownership does not only project a wealthy image but also means the availability of transportation to maternal health care services. This is also seen in Peru where socioeconomic condition, as measured by husband's occupation, index of durable goods and water supply significantly influence the use of maternal health care services (Elo 1992). However, an opposite situation is seen in Guatemala (Glei et al., 2003, p. 2456-9) where availability of biomedical services in the community, vehicle ownership, health insurance coverage, access to free care and household consumption are not significantly related to pregnancy care. The insignificant of household consumption that reflects family income and the accessibility of health care services may be stimulated by condition that many women depend on government facilities which present services at little or no cost. The possible explanation which creates women's reluctance to use health services is the inadequate of quality (Glei et al., 2003, p. 2459).

Another component of individual determinants, level of illness, influences health seeking behavior through the severity of specific symptoms which emerge as preconditions for finding treatment. Some scholars describe this component as a need factor because the existence of illness shows the need of treatment (Andersen, 1995; Chakraborty et al.,

2003, p. 329; Glei, et al., 2003, p. 2449). Unfortunately, the need more likely depends on individual perception of risk about illness or symptoms than the medical definition of risk (Gleiet, al., 2003, p. 2450). In this situation individual background such as knowledge about illness and previous experience will influence perception. In Bangladesh, the type of illness emerges as the most important variable to influence the use of maternal health care services (Chakraborty, et al., 2003, p. 335). Illnesses which have a high degree of severity are positively associated with health care seeking behavior. The study in Bangladesh defines haemorrhage, convulsion, edema, hypermesis and fever/cough for more than 3 days during pregnancy as life threatening or high risk. In addition Glei et al. (2003, p. 2456-8) found that women with a history of previous caesarean deliveries have a greater likelihood of using a biomedical provider compared to women who did not have a previous experience of caesarean delivery.

Andersen (1995, p. 8) later revised the framework for viewing health services utilization by including some new variables. In the revised framework the outcome component is shown to include environment, population characteristics and health care behavior. That is why this framework is more comprehensive compared to the previous framework. Unfortunately the present study can not discuss all the components of Anderson's framework that may influence the utilization of maternal cares because of the unavailability of the data. The study will focus on the role of women's knowledge about pregnancy complications, women's empowerment, economic condition of the household, and husband's involvement. In Andersen's framework these aspects can be included in the Enabling Component.

It has been shown in several studies that women's status is one of the determinants of maternal health (Defo, 1997; Okojie 1994; Kawachi, et al, 1999). Oppong and Wery (1994 cited in Defo, 1997, p. 1028) also mentioned that women's status can be measured through two approaches. Firstly, women status can be visualized as the capability to control various resources, degree of women's autonomy from men, and other aspects of their privileges in social institutions. Secondly, women's status can be described by comparing resources which are available across social strata such as socioeconomic class (education or occupation). Furthermore Thaddeus & Maine (1990, p.25) define women's status as a composite indicator which consists of educational, cultural, economic, legal and political positions of women in a given society. Thaddeus and Maine found that women's status plays a significant role to determine health seeking behavior. Women with lower status tend to have lower autonomy. This can influence the ability of women to decide their own health treatment. That is why Thaddeus and Maine (1990, p.25) stated that lower

status of women is one aspect that can delay the decision to seek health care.

Caldwell (1979, p. 408) states that women's autonomy is the most important determinant of child health and child mortality. This finding is based on Nigerian data and cultural backgrounds where women are sometimes seen as strangers and therefore have less power to make decisions in the household. Moreover, in such situations children belong to the extended family where grandparents have direct authority over the children. As a result the mothers have to consult their mothers or mother-in-law if they want to seek health care for their children. In this case the mothers' knowledge about the right health treatment and nutrition is not useful if they do not have any authority to support their initiative to seek health care for their children. Therefore by having authority to make decisions mothers can implement their knowledge about child health to provide better child care. This condition can also be extended to health seeking behavior. Women's status may become the most important factor influencing health seeking behavior during pregnancy and child birth. Sometimes women who come from good socioeconomic backgrounds can not afford to obtain proper treatment because they do not have the power to make decisions and control the resources. Thus, some of the variables belonging to the Enabling Component may lose significance in explaining health seeking behavior because of low women's status.

Because of the importance of women's status, World Bank (2001) states that women's empowerment is one of the indicators of development and an important element of poverty reduction. The term "empowerment" is often described by other words. Malhotra et al (2002 p. 6) has cited some terms which are used by many scholars to illustrate women's empowerment, such as status, autonomy, domestic economic power, bargaining power or gender equality. In their application, these terms do not have much clear difference. However Dixon-Muller (2001) states that the concept women's empowerment is more dynamic and comprehensive than women's status or women's autonomy. This is in line with the opinion of Malhotra et al (2002, p. 7) that empowerment consists of two main components: process and agency. Process means that empowerment progresses from one condition to another. It does not emphasize an end result. Agency refers to women's involvement as actors for the process of change. Moreover Oxaal and Baden (1997) mentioned also a comprehensive meaning of women's empowerment. By using the root of the term empowerment, namely power can be defined as:

1. Power over: this power involves an either/or relationship of domination/subordination.

2. Power to: this power relates to having decision-making authority and power to solve problems and can be creative and enabling; and
3. Power with: this power involves people organizing with a common purpose or common understanding to achieve collective goals;
4. Power within: this power refers to self confidence, self awareness and assertiveness. (Oxaal & Baden, 1997, p.1).

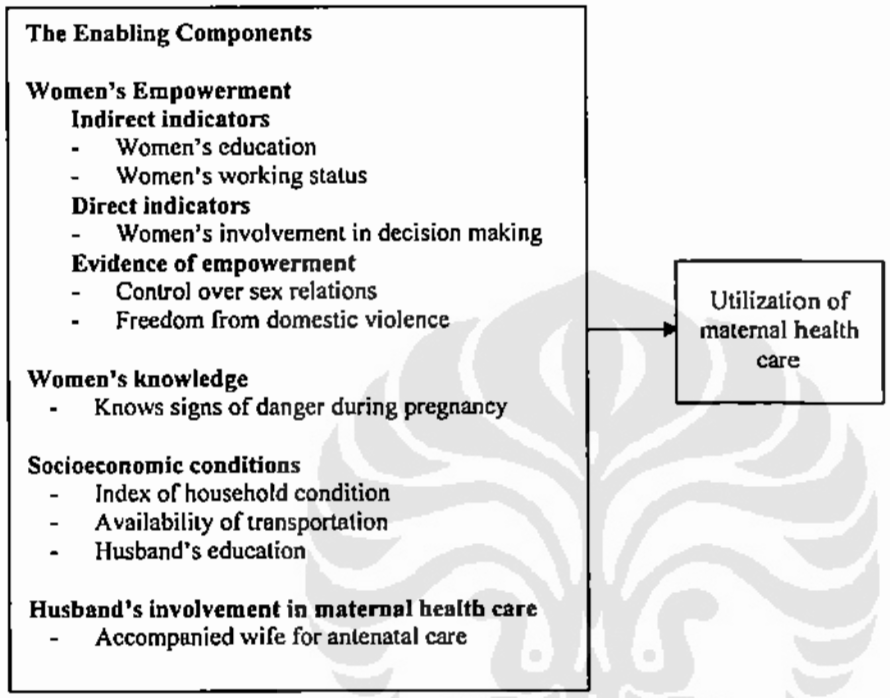
The present study is more likely to use the concept of women's empowerment rather than women's status or autonomy. In addition Saikia (2004, p. 226) states that it is important to move from traditional indicators of women's status to more broad-based concept of women's empowerment to explain demographic processes. Because traditional indicators of women' status or autonomy do not concern with women's capacity to resist the imposition of others or overcome external barriers. Furthermore Saikia's study (2004, p. 212) found that women from Khasi tribe in Northern India have high autonomy but it does not mean that women are empowered. Therefore their reproductive behavior is still influenced by their environment which is not supportive to utilize their autonomy.

This study uses Roy et al. indicators (2004, p. 26) to illustrate women's empowerment. However not all the variables used by Roy and Niranjan are used here because of data limitations. The indicators of women's empowerment chosen for the present study can be grouped into three categories; indirect indicators, direct indicator and evidence of empowerment (see Figure 2). These indicators are complete in defining the various dimensions of women's empowerment that have been Mentioned by Malhotra et al. (2002 p. 13), such as economic, socio-cultural, familial/ interpersonal, legal, political and psychological dimensions. In the present study the indicators explain women's access to family resources, women's freedom of movement, women's participation in decision making, and women's self esteem, but do not encompass the legal and political dimensions of women's empowerment that could be used to describe women's knowledge or awareness about their legal rights and their right to engage in politics (Malhotra et al., 2002, p. 13).

The Enabling Component comes from community, household, and individual conditions. Household condition and the characteristics of household members are included in the Enabling Component because they illustrate the level of socioeconomic conditions that influence health seeking behavior. The mother, as a member of the family, will also be influenced by the level of socioeconomic condition of the household. In case of health seeking behavior higher socioeconomic level of household is expected to be of benefit to the mothers. However this may not always

be true, especially if the mother does not have authority to control resources. Sometimes, the husband has the greatest power to control all of the resources in the household. Therefore the involvement of husband in maternal health care is an essential factor which could influence women's health seeking behavior. Berhane et al. (2001, p. 1538) mentioned that it is very crucial to encourage men's involvement to the improvement of women's empowerment as women and men live together.

Figure 2
THE ROLE OF THE ENABLING COMPONENTS IN THE UTILIZATION OF MATERNAL HEALTH CARE



Source: Modified from Andersen (1995, p. 8).

Regarding the variables of the Enabling Component that may influence women's ability to obtain proper treatment during pregnancy, the present study will use a conceptual framework which focuses on women's empowerment, their knowledge; their socioeconomic condition and their husband's involvement in maternal health care (see Figure 2). This framework does not include various types of illness that determine an individual's need to seek health care, because the units of analysis are pregnant women with complications and no information is available about any other illness of these women except their pregnancy complications. All types of pregnancy complications are assumed to indicate the need to

obtain health care. In other words, all women who are analyzed should need to be treated in health care service facilities.

3. DATA SOURCES

The data which used in this study comes from the 2002-2003 Indonesia Demographic and Health Survey or the 2002-2003 IDHS (BPS, et al., 2004). This survey was conducted in 26 provinces which represent around 96 percent of the total population of Indonesia. The sample was chosen by using a Census sampling frame which contains a list of census blocks. Ever married women aged 15-49 years and currently married men aged 15-54 years were eligible for interviews. In every block 25 eligible women and eight eligible men were interviewed. In those blocks where there were fewer than 25 eligible women, all eligible women were interviewed.

Five types of pregnancy complications are listed in the questionnaire and respondents were asked to mention whether they had experienced one or more of these complications. Evidently the questionnaire did not contain a complete list of possible pregnancy complications because the most frequent complication cited by the respondents was "other" than those listed by the questionnaire. Unfortunately the data do not provide further details about the "other" category.

The women could take several actions to overcome the pregnancy complications. Visiting the health centers and seeing the doctor or midwife were the most popular actions taken by the respondents. However, a significant number of women resorted to actions which could be risky to their health such as just resting, taking herbs and medication or seeing traditional healers like Traditional Birth Attendants (TBA). There were 28 women who took no action to treat their pregnancy complications. Action taken by women to treat their pregnancy complications is the dependent variable denoted by Y. Pregnant women with complications are grouped into two categories. The first category consists of women who went to doctor, midwife or a health facility (Y=1) and the second category consists of women who sought help from non-medical persons or did not seek any help for their complications (Y=0).

Women's empowerment is an independent variable and is measured by using three sets of indicators. These indicators are adapted from Roy and Niranjan's study (2004) which tries to find the best measure for women's empowerment in India. Their first set of indicators consists of women's working status, women's educational level and educational gap between husband and wife. This first set of indicators provides

indirect measures of women's empowerment. Their second set of indicator comprises women's involvement in decision making, freedom of movement and access to money. Roy and Niranjan's third set of indicators provides other evidence of empowerment not captured in the first two sets. However not all the indicators in Roy and Niranjan's study are used in the present study because of limitations of data.

In this study the indirect indictors is represented by women's educational level and working status. Moreover women's involvement in decision making for their own health care, daily purchases, large purchases and visiting families/relatives are used to reflect direct indicators. Then women's ability to control sexual relations and freedom from domestic violence can illustrate the evidence of women's empowerment. Women's ability to control sexual relation is reflected from women's capacity to refuse having sex with her husband for rational reasons. Furthermore women's capacity to reject husband beating for specific reasons illustrate women's freedom from domestic violence. The complete description of these variables can be seen in Table 1.

Another factor, which is used to explain utilization of health care services, is husband's involvement in maternal health care. The only information collected in the survey that is eligible for this study and can provide information on this variable is whether the husband accompanied the wife during antenatal care. There is the other information from female questionnaire which also can describe husband's involvement in maternal care such as whether husband accompanies his wife during delivery. This information is not collected from all respondent but only for women who had delivery in health centre. As a result this variable will not show husband's influence to affect utilization of maternal health care since women have already utilized health facilities. In addition the majority of pregnant women gave birth at home. Therefore deployment of this variable may reduce the number of valid cases remarkably. The other information about husband's involvement in maternal health care comes from male questionnaire such as (i) whether husband's received advice from medical carers about maternal health, (ii) husband's discussion with professional health care about mother's health, (iii) husband's knowledge about pregnancy complication, and (iv) husband's discussion with someone else about delivery preparation. Those data reflect husband's knowledge and attention to women's health. However that information did not provide the real action of husband's involvement in maternal health care since the husband's knowledge may not be transferred in to real actions.

Household socioeconomic condition is used to assess the significance women's empowerment and husband's involvement in influencing the utilization maternal health care. Specific scores are allotted

to various items of household possession to obtain a composite index of the socioeconomic condition of the household. These scores depend on the type of floor, roof, wall, toilet facilities, main sources of drinking water, and availability of some durable goods. In this case the lower score of floor, roof, wall, toilet facilities or main source of drinking water reflect the better quality and also illustrates better economic condition. Moreover the availability of durable good is scored as 1 if the household has the good and 2 for the inexistence of the good. There is no specific reason to determine the score system to access household condition. The score is mainly based on the practicability and availability of information in the questionnaire. As consequence of this scoring system the lower score illustrates the better socioeconomic condition of household. Socioeconomic condition can also be reflected by the availability of private means of transportation. Availability of transportation can also overcome the obstacle regard to distance to seek health care services and increase the accessibility of health services. Husband's education is also useful to describe socioeconomic condition of the household because his level of education will influence household income. In addition husband's education can also influence husband's knowledge about maternal health care since high education is more likely to affect the ability to absorb or adapt new information, innovation or technology relate to maternal health care. Therefore husband's education may also influence his involvement in maternal health care.

Table 2
VARIABLES SELECTED IN THE ANALYSIS OF THE MATERNAL HEALTH CARE UTILIZATION IN INDONESIA, IDHS, 2002-2003

Symbol	Name of Variables	Value	Value Label
DEPENDENT VARIABLES			
Y	Utilization of maternal health care for pregnancy complication	0	TBA/ other non-medical carers
		1	Professional health providers
INDEPENDENT VARIABLES			
Women's empowerment			
Indirect indicators			
X_1	Women's education	0	No education/ primary
		1	More than primary
X_2	Women's working status	0	Not working/unpaid workers
		1	Paid workers
Direct indicator			
X_3	Women's involvement in decision making	0	Not involved in any decision
		1	Involved in all 4 decision making
Evidence of empowerment			
X_4	Control over sexual relations	0	Low control/not at all
		1	High control

Table 2 (*Continued*)

Symbol	Name of Variables	Value	Value Label
X_5	Freedom from domestic violence	0	Accept/partly resist violence
		1	Fully resist violence
Husband's involvement in maternal health care			
X_6	Husband accompanies during antenatal care	0	No
		1	Yes
Women's knowledge			
X_7	Knows signs of danger during pregnancy	0	No
		1	Yes
Socioeconomic conditions of household			
X_8	Availability of transportation	0	Have no scooter, motorcycle, car or truck
		1	Have scooter, motorcycle, car or truck
X_9	Husband's education	0	No education or primary
		1	More than primary education
X_{10}	Household condition	1	Low
		2	Medium
		3	High

4. THE RELATIONSHIP BETWEEN OF SOCIO-ECONOMIC CONDITION OF WOMEN AND UTILIZATION OF MATERNAL HEALTH CARE

Available evidence suggests that economic condition is a vital factor to affect health seeking behavior (Adamson, et al., 2003; Biswas, 2003; Celik & Hotchkiss, 2000; Elo, 1992; Stekelenburg, et al., 2004; Thind & Banerjee, 2004). It is obvious that a good economic condition can improve women's accessibility to maternal health care through the ability to pay the overall cost of professional health services such as transportation to health centers, medicine and costs of medical treatment. Economic status has also been seen to have an inconsistent effect on the utilization of health care (Becker, et al., 1993; Glei, et al., 2000). However, bad economic condition can still be an obstacle to obtaining professional health services in Indonesia (MNH program, 2002).

This study uses three variables to represent household economic conditions, namely availability of transportation, husband's education, and housing condition. Housing condition is represented by a composite index comprising material of floors, walls and roof, and the availability of piped water, private toilet, and durable goods. Availability of transportation can be a vital determinant of health care utilization in cases of emergency due to pregnancy complications since Indonesia has geographic condition which may lead to delays in obtaining medical treatment (McGeown,

2004). The household's capabilities to buy transportation tools, build a good quality house and obtain durable goods reflect the household economic status. Husband's education can become a proxy for household economic condition because it may relate to husband's occupation and income.

Table 3
PERCENTAGE OF PREGNANT WOMEN WITH PREGNANCY COMPLICATIONS IN THE FIVE YEARS PRECEDING THE SURVEY BY ECONOMIC CONDITION AND ACTION TO TREAT THE COMPLICATION, INDONESIA, IDHS, 2002-2003

Household economic condition	Action taken to treat pregnancy complications (Y)		Total
	Didn't go to professional health services (%)	Went to professional health services (%)	
Availability of transportation (X_8)			
No	24.80	75.20	100.0
Yes	13.54	86.46	100.0
Husband education (X_9)			
No education / primary	33.87	66.13	100.0
More than primary	12.17	87.81	100.0
Housing condition (X_{10})			
Low	30.53	69.47	100.0
Medium	20.03	79.97	100.0
High	14.20	85.80	100.0
Total	20.20	79.80	

Source: The 2002-2003 IDHS dataset.

The cross tabulation analysis of the 2002-2003 IDHS data shows that women who came from good economic conditions were more likely to use professional health care services than women who came from low economic conditions. It can be seen from Table 3 that women who lived in households with own transport and whose husbands were educated to more than primary school had a greater tendency to utilize professional health care services compared to women who lived in households without own transport and whose husbands were educated to primary school or less. Housing condition reflects the effects of household economic conditions to influence utilization of maternal health care services. The better the housing condition the higher the percentage of women using professional health care providers. A comparison of three variables of economic condition also reveals that husband's education appears to have a strongest influence on women's health seeking behavior (see the difference in percentages between the categories of each variable in Table 3). Among the variables influencing the utilization of health care in pregnancy complications, husband's education is the strongest, followed by housing condition and the availability of transportation in that order.

5. THE RELATIONSHIP BETWEEN WOMEN'S EMPOWERMENT AND UTILIZATION OF MATERNAL HEALTH CARE

This essay uses five variables to indicate the women's empowerment, women's education, women's involvement in paid work, involvement in decision making, control over sexual relation and freedom from domestic violence. The results of the 2002-2003 IDHS show that the majority of women in the sample had low education, with only 6 percent having higher education and 73.2 percent of the women were either not working or engaged in unpaid work. It illustrates that women's education and their access to economic resources should be improve. In the area of decision making women tended to involve in decision which relates to their function as house wife. Therefore more than 95 percent of sample involved in daily purchases. But unfortunately there were around 15 percent of sample that did not involve in decision making about own health care. Even 20 percent did not involve in large purchases. In addition nearly a third of sample accepted or just partly resisted domestic violence. All those information sources from the 2002-2003 IDHS reflect that women's empowerment in Indonesia needs improvement.

Furthermore this section shows a similar result when only those women are considered who had a pregnancy complication in the five years before the survey, namely that women's empowerment affects their health seeking behavior for treating pregnancy complications. Table 4 reveals that women who had better education, had paid work, had been involved in four types of decision-making and had fully rejected domestic violence were more likely to seek professional health care services for their pregnancy complications. On the other hand, control over sexual relations did not appear to have any influence on health seeking behavior. The percentage of women who used medical care to treat pregnancy complications was higher for those women who had low control over sexual relations than those women with high control over sexual relations, although the gap between the two percentages is very small. Furthermore women's education and women's involvement in decision making may be considered to have the greatest influence on the utilization health services.

Table 4
PERCENTAGE OF PREGNANT WOMEN WITH A PREGNANCY COMPLICATION IN THE FIVE YEARS PRECEDING THE SURVEY BY WOMEN'S EMPOWERMENT INDICATORS AND ACTION TAKEN TO TREAT THE COMPLICATION, INDONESIA, IDHS, 2002-2003

Women's empowerment indicators	Action to treat pregnancy complications		Total
	Didn't go to professional health services	Went to professional health services	
Women's education (X_1)			
No education / primary	28.38	71.62	100.0
More than primary	15.13	84.87	100.0
Working status (X_2)			
No work/ unpaid work	21.49	78.51	100.0
Paid work	17.32	82.68	100.0
Involvement in decision making (X_3)			
Not involved in any decision	28.14	71.86	100.0
Involved in all 4 decisions	16.47	83.53	100.0
Control over sexual relation (X_4)			
Low control	19.75	80.25	100.0
High control	20.48	79.52	100.0
Freedom from domestic violence (X_5)			
Accept/ partly accept	22.55	77.45	100.0
Fully reject	18.93	81.07	100.0
Total	20.20	79.80	100.0

Source: The 2002-2003 IDHS dataset

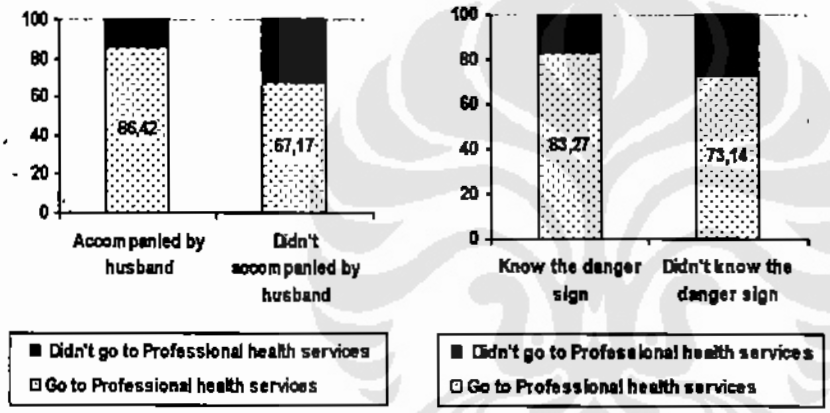
6. THE RELATIONSHIP BETWEEN HUSBANDS' INVOLVEMENT WITH WIVES' UTILIZATION OF MATERNAL HEALTH CARE RELATED TO PREGNANCY COMPLICATIONS

In Nigeria women expect men to take important roles in maternal health care such as taking the wife to the hospital, provide her with money, show her affection, ensure compliance with medication, and ensure the wife's health (Odimegwu, 2002). This may be true also for other countries since women are highly dependent on their husbands. Moreover, due to several constraints faced by women, such as lack of access to economic resources, lack of freedom of movement or

incapability to make decisions, men must play a crucial role to identify and satisfy women's health needs (Shaikh & Hatcher, 2004). Those constrains, if not counterbalanced by men's support, may inhibit women to seek proper and timely health care. Men's involvement in health care may help their wives to perceive their needs for treatment and increase the utilization of maternal health care.

The IDHS 2002-2003 data also shows that husbands' involvement in maternal health care do influence women's health seeking behavior. Nearly 90 percent of the women, who were accompanied by their husbands for antenatal care, took medical treatment for curing their pregnancy complications (Figure 3). On the other hand, although the majority of women who were not accompanied by their husbands for antenatal visits also sought medical treatment for their pregnancy complications, but their proportion is under 70 percent.

Figure 3
PERCENTAGE OF PREGNANT WOMEN WITH A PREGNANCY COMPLICATION IN THE FIVE YEARS PRECEDING THE SURVEY BY HUSBAND'S COMPANIONSHIP FOR ANTENATAL CARE, WOMEN'S KNOWLEDGE SIGNS OF PREGNANCY COMPLICATIONS AND ACTION TAKEN TO TREAT THE COMPLICATIONS, INDONESIA 2002-2003



Source: The 2002-2003 IDHS dataset.

7. THE RELATIONSHIP OF WOMEN'S KNOWLEDGE OF DANGER SIGNS OF PREGNANCY COMPLICATIONS WITH UTILIZATION OF MATERNAL HEALTH CARE

Figure 3 also illustrates that women's knowledge about danger signs of pregnancy complications can influence their health

seeking behavior. Of those women who knew about danger signs of complications during pregnancy, 83.27 percent sought medical treatment to cure the complications. This is 10 percentage-points higher than the percentage of women seeking medical treatment from among those who did not have knowledge of such danger signs. This finding indicates that women's awareness about health problems can increase their utilization of medical care in cases of pregnancy complications. This is in agreement with findings in Southern Laos where women's knowledge about maternal health problems influences their utilization of maternal health care (Phoxay, et al., 2001, p. 17). Besides making the women favorably disposed towards medical (obstetric) care, knowledge about health problems can help remove the women's misconceptions about obstetric care caused by cultural beliefs.

8. THE ANALYSIS OF ENABLING FACTORS

8.1 Process of Forming Model

This section is devoted to finding the most powerful variables which influence the utilization of maternal health care services to address pregnancy complications. Since the dependent variable (Y) in this analysis is a dichotomous variable, a logistic regression is used for the analyzing its influence on maternal health care utilization for pregnancy complications. Even though logistic regression is relatively free of restrictions there are some practical issues which are crucial and may influence the prediction of regression (Tabachnick & Fidell, 2001, p. 521). Those practical issues comprise the number of cases compared to number of variables, sufficiency of expected frequency, linearity of the logit, absence of multicolinearity, absence of outliers, and independence of the error term. Moreover, meaningful coding, inclusion of all relevant variables, exclusion of all irrelevant variables and interaction between variables are also important to build a good model (Garson, 2004).

The number of cases (911 women) in this study is very large compared to the number of variables (10 independent variables and one dependent variable). However, the number of cells (possible combinations of categories of each variable) is also large and it is more than the number of cases. This condition is exacerbated by the imbalanced distribution of cases between categories. As a consequence there are many cells, combination of discrete variables, which are empty. In this case there are 1,536 cells and around 80 percent of those cells are empty. To overcome this problem Tabachnick & Fidell (2001, p. 521) suggest to delete the unimportant variables or reduce the number of categories within variables. The last suggestion can not be done because all the variables in this study have already been dichotomised except housing condition (X_{10}), which has

three categories. Therefore the most practical method to solve this problem is to reduce the number of independent variables. Because all independent variables are relevant variables it is difficult to decide which variables must be deleted. A wise way to choose the most important variable can be done by creating logistic regression based on the group of independent variables. Therefore in the first step four logistic regressions are created. Those regressions consider women's empowerment, husband's involvement, women's knowledge and economic condition as independent variables separately.

Model 1 in Table 5 shows that of the five variables representing women's empowerment, only two variables namely, women's education (X_1) and women's involvement in decision making (X_3) are statistically significant in explaining women's health seeking behavior during pregnancy complications. Moreover exp (β) or the odds ratio reveals that women with education more than primary school and involved in all four types of decision making have a greater propensity to use medical care. The odds ratio 2.169 indicates that women with above primary school education are more than two times likely to go to professional health providers compared to women with less than primary school education or no education. Further, women who were engaged in all four types of decision making were nearly two times (1.916) more likely to use maternal health care than women who were involved in fewer types of decision making.

In, Models 2 to 4, it can be seen that husband accompanies during antenatal care (X_6), knows signs of danger during pregnancy (X_7), husband's education (X_9), and housing condition (X_{10}) are statistically significant in explaining women's health seeking behavior during pregnancy complications. Somewhat surprisingly, availability of transportation (X_8) is not a significant determinant of health seeking behavior in pregnancy complications. This may be caused by the availability of public transportation which can affect accessibility of health facilities. The beta-coefficients of the significant variables are positive which give values of the odds ratio as greater than 1. An odds ratio greater than 1 implies that the variable category with the code 1 has a higher tendency to use professional maternal health care during pregnancy complications compared to the variable category with the code 0. However, there is an exception to this, with respect to variable housing condition (X_{10}), because this variable consists of more than two categories (i.e., it is not a dichotomous variable, but rather a polytomous variable). To obtain the regression coefficients (beta coefficients) and the odds ratios, the method of parameter coding with particular category as reference can be applied (Hosmer and Lemeshow, 1989, p. 49). In this case the last category (i.e., low quality housing conditions) is used as the reference category and each of the high quality and medium quality

housing condition is compared to this reference category. As a result there are two beta-coefficients which represent the first and second categories. For the first category, the odds ratio of 1.840 means that women living in high quality housing have a propensity to use maternal health care during pregnancy complications that is 1.84 higher compared to women living in low quality of housing. Similarly, women living in medium quality housing are 1.536 times more likely to use maternal health care during pregnancy complications compared to women living in low quality housing (see Model 4, Table 5).

To form the logistic regression model this study uses the forward log likelihood ratio selection available in SPSS (Norusis, 1990, p.57). The last step produces the final model. Table 4.4 also presents a summary of the model derived in the last step of stepwise logistic regression. Thee summary model for the last step is the most important output for analysis. The model Chi-square test, which is usually called the likelihood ratio test or log-likelihood test, is computed based on deviance (Garson, 2004; Hosmer & Lemeshow, 1989, p. 15; Norusis, 1990, p. 52). This provides the significance test for the logistic model. The logistic model is significant if p is less than 0.05. Each of the Models 1 to 4 has a $p = 0.000$, which indicates that these models provide good fit to the data. The goodness of fit of Models 1 and 4, derived from the Hosmer and Lemeshow's test are close to 1 indicating very good fit. For Models 2 and 3, the results of Hosmer and Lemeshow's test do not appear in the SPSS ouput, which may be caused by the fact that there is only one variable in the analysis, so the process selection is only one step, whereas the Hosmer and Lemeshow's coefficient appears after the first step.

The other statistic which measures the ability of the model to explain the total variation in the dependent variable is R^2. However, since the present model does not have a statistic similar to the R^2 of ordinary least squares regression, a logistic R^2 has been proposed (Garson 2004). In the SPSS output there are two logistic R^2 values: the Cox and Snell's R^2 and Negelkerke's R^2. Negelkerke's R^2 is a modification of Cox and Snell's R^2 which takes a value between 0 and 1 (Garson 2004). Negelkerke's R^2 is used here to asses the explanatory power of the logistic regression model. Table 4.5 reveals that all the models can not explain the data well, as indicated by the less than 10 percent values of R^2 for all models except Model 4 which has R^2 of 10.5 percent.

In general it can be said that model 1 to 4 is quite good. However it is also apparent that those models are not sufficient to explain utilization of maternal care since the R^2 is very low. This is not a big problem because the main aims in creating these models are to select the most important variables for further analysis. The analysis in Models 1 to 4 indicate that the variables X_1, X_3, X_6, X_7, X_9 and X_{10} are selected for

further analysis. Based on these variables there are 96 cells as result of the combination of categories. Among those cells only 7 cells (or 7.29 percent of total cells) are empty.

After fulfilling the condition that the number empty cell is not large compared to the total number of cells, a logistic regression equation is formed. The Box Tidwell transformation for X_1, X_3, X_6, X_7, X_9 and X_{10} is included in the regression (Garson, 2004; Tabachnick & Fidell, 2001). This is important for checking the linearity of logit which is crucial to build a good logistic regression equation (Hosmer and Lemeshow, 1989; Tabachnick & Fidell, 2001). But this transformation produces constant variables with zero values for the dichotomous variables, and as a consequence only the quantity (X_{10}*ln X_{10}) appears in the model. The result of SPSS output can be seen in Model 5 (Table 6). Three independent variables, X_3, X_6 and X_9, are found to be significantly related to utilization of health care in pregnancy complications. From the summary model it is clear that Hosmer and Lemeshow's test rejects the null hypothesis that there is no difference between predicted values and observed values. Therefore this model does not provide a good fit to the data. One possibility for this is the existence of outliers. Model 6 is therefore built by excluding the outliers. The outlier is determined by standardized residual from Model 5. If the cases have standardized residual with values greater than 1.96 then the cases will be excluded from analysis (Garson, 2004). As a consequence 92 cases are excluded from analysis.

Table 5
SUMMARY OF LOGISTIC REGRESSION OF THE ANALYSIS OF THE EFFECTS OF DIFFERENT VARIABLES ON WOMEN'S HEALTH SEEKING BEHAVIOUR IN PREGNANCY COMPLICATIONS (MODELS 1 TO 4), INDONESIA, IDHS, 2002-2003

Independent Variables	Model 1		Model 2		Model 3		Model 4	
	$\hat{\beta}$	Exp($\hat{\beta}$)	$\hat{\beta}$	Exp($\hat{\beta}$)	$\hat{\beta}$	Exp($\hat{\beta}$)	$\hat{\beta}$	Exp($\hat{\beta}$)
Women's empowerment								
X_1 (Women's education)	0.774	2.169						
X_2 (Working status)	n.s	n.s						
X_3 (Involvement in decision making)	0.650	1.916						
X_4 (Control over sexual relation)	n.s	n.s						
X_5 (Freedom from domestic violence)	n.s	n.s						
Husband's involvement								
X_6 (Husband accompanies during antenatal care)			1.135	3.111				
Women's knowledge								
X_7 (Know sign of danger during pregnancy)					0.603	1.827		
Socioeconomic condition								
X_8 (Availability of Transportation)							n.s	n.s
X_9 (Husband's education)							1.069	2.914
X_{10} (Housing condition)								
X_{10} (1) (High)							0.610	1.840
X_{10} (2) (Medium)							0.429	1.536
Model summary for the last step								
Model Chi-Square test		0.000		0.000		0.000		0.000
Hosmer & Lameshow test		0.940		.		.		0.913
Nagelkerke R Square		0.063		0.075		0.022		0.105
Percentage correct of prediction		79.8		80.2		79.8		79.1

Note: n.s. = not significant at level 0.05.
The reference category for X_{10} comprises households with low quality of housing.

Table 6
SUMMARY OF LOGISTIC REGRESSION ANALYSIS OF THE EFFECTS OF DIFFERENT VARIABLES ON WOMEN'S HEALTH SEEKING BEHAVIOUR IN PREGNANCY COMPLICATIONS (MODELS 5 TO 7), INDONESIA, IDHS, 2002-2003

Independent Variables	Model 5		Model 6		Model 7	
	$\hat{\beta}$	Exp($\hat{\beta}$)	$\hat{\beta}$	Exp($\hat{\beta}$)	$\hat{\beta}$	Exp($\hat{\beta}$)
Constant	-0.001		-1.371		-1.355	
X_1 (Women's education)	n.s.	n.s	n.s.	n.s	-	-
X_3 (Involvement in decision making)	0.467	1.595	2.171	8.768	2.201	9.034
X_6 (Husband accompanies during antenatal care)	0.900	2.460	3.421	30.591	3.436	31.070
X_7 (Know sign of danger during pregnancy)	n.s.	n.s	0.668	1.949	0.639	1.895
X_9 (Husband's education)	0.947	2.577	2.981	19.712	2.969	19.476
X_{10} (Housing condition)						
X_{10} (1) (High)	n.s.	n.s	n.s.	n.s.	-	-
X_{10} (2) (Medium)	n.s.	n.s	n.s.	n.s.	-	-
$X_{10} * \ln(X_{10})$	n.s.	n.s	n.s.	n.s.	-	-
Model summary for the last step						
Model Chi-Square test		0.000		0.000		0.000
Hosmer & Lameshow test		0.000		0.527		0.690
Nagelkerke R Square		0.143		0.586		0.587
Percentage correct of prediction		82.4		92.3		92.6

Note: n.s = not significant al level p=0.05
- = not included in model selection.
The reference category for X_{10} represents households with low quality housing conditions.

The result of logistic regression without the outliers can be seen in Model 6 (Table 6). Women's knowledge about danger signs of pregnancy complications (X_7) now emerges as a significant variable even though it was not significant in the previous model. The Hosmer and Lemeshow's test reveals that Model 6 provides a good fit to the data. Another improvement in the model can be seen from the Negelkerke R^2. This statistic for Model 5 is only 0.143 but it has increased remarkably to 0.586 for Model 6. In addition, Model 6 also has high a value of the odds ratio, which can be used to assess the importance of the independent variable to predict the dependent variable (Garson, 2004). The high odds ratio shows that the independent variable is a good predictor of the dependent variable. It may be argued that an extremely large parameter estimate (such as the ß-coefficient) or its exponential (such as the odds-ratio) may also be due to too few cases (i.e., the number of respondents) relative to the number of predictor variables (Tabachnick & Fidell, 2001: p-521). Unfortunately there is no standard to indicate whether an odds ratio, such as that obtained in Model 6 is extremely large. But the reduction of the number cases (due to the exclusion of outliers) could create problems in Model 6. A cross tabulation of the data shows that there are only 8 empty cells in a total of 96 cells, which does not support the suggestion that the high values of the odds ratio in Model 6 are due to a large number of empty cells resulting from a very small sample size (or the small number of cases). Another proof that the high values of the odds ratio in Model 6 are not due to the existence of empty cells can be seen in Model 7. This model is built by using only four of the significant predictor variables of Model 6. This makes the number of cases in Model 7 large enough to fill all combinations of cells that now decrease in number from 96 to 16 cells. Model 7 reveals that the odds ratio is still high and values of all the statistics (such as the R^2 or percentage correct prediction) of Model 7 are similar to those of Model 6. In other words, the explanatory power or the predictive power of the model has not been reduced by using fewer predictor variables. Therefore it can be inferred that the high odds ratios of Model 6 reflect genuine properties of the data and are not caused by fewer number of cases.

So far the Model 6 have already considered some practical issues for forming logistic regression such as number of cases compared to number of variables, linearity in the logit, absence of outliers, and sufficiency of expected frequency which can be seen directly from Chi-square test. However the absence of multicolinearity and independence of the error term have not yet been discussed. Multicolinearity can be examined from the correlation matrix in the SPSS output (see appendix 2). It is clear that the coefficient of correlation between the independent variables is very low, therefore it may be assumed that the problem of multicolinearity does not exist in Model 6. The independence of the error term is important because the logistic regression method assumes that the

response for different cases are independent each other (Tabachnick & Fidell, 2001). A violation of this assumption can be caused by correlated cluster samples or repeated measurements or from time series data (Garson, 2004). Fortunately, the present study uses data which are not collected by using repeated measurement or from time series data. Therefore, the responses of cases and the error terms are likely to be independent of each other.

9. THE VARIABLES WITH THE GREATEST INFLUENCE ON THE UTILIZATION OF MATERNAL HEALTH CARE

Based on discussions in the previous section, Model 6 has been chosen to analyze several variables constituting the enabling factors which affect women's health seeking behavior to cure pregnancy complications. In general, the logistic regression equation in Model 6 is:

$$\log\left[\frac{\pi(x)}{1-\pi(x)}\right] = -1.371 + 2.171\,x_3 + 3.421\,x_6 + 0.668\,x_7 + 2.981\,x_9$$

(The coefficients are taken from model 6 Tables 4.6)

Another confirmation of the significant contribution of the predictor variables X_3, X_6, X_7 and X_9 to the dependent variable Y_4 is obtained from the Wald test (Tabachnick & Fidell, 2001, p. 524). The Wald statistics show that the predictor variables X_3 (women's involvement in decision making), X_6 (Husband's involvement in maternal care) and X_9 (Husband's education) are statistically highly significant ($p = 0.000$) determinants of Y_4 (utilization of maternal health care). The other predictor variable X_7 is also statistically significant determinant of Y_4, but at a lower level of significance ($p = 0.039$).

An alternative to assess the importance of independent variables is by using odds ratio (Garson, 2004). Furthermore regarding the odds ratio from Model 6 (Table 4.6) it can be said that:

1. Women who were involved in four types of decision making have a propensity to use maternal health care to treat pregnancy complications that is more than 8 times higher than women who were not involved in at least in type of one decision making.
2. The likelihood of women, who were accompanied by their husbands for antenatal care to use maternal health care for treating pregnancy complications, is more than 30 times greater

than women who were not accompanied by their husbands for antenatal care.

3. Women who knew the danger signs of health problems during pregnancy were nearly twice more likely to use maternal health care for treating pregnancy complications than women who did not know such danger signs.
4. Women whose husbands had above primary school education had a tendency to use maternal health care to treat pregnancy complications that is more than 19 times compared to the tendency of women whose husbands had primary school or no education at all.

Therefore, the analysis of the 2002-2003 IDHS data has helped identifying four factors, which strongly influence maternal health care in pregnancy complications. These four factors are husbands' involvement in maternal health care, husbands' education, women's involvement in decision making, and women's knowledge of danger signs of pregnancy complications. Therefore, any intervention program aimed at improving maternal health in Indonesia should address the issues related to the four factors mentioned above.

Moreover, by using the logistic regression equation of Model 6, the probability of women to use maternal care can be calculated. Table 7 shows the result of the calculations. Every cell in this table represents one combination of categories of all variables which are significant. For example, the quantity 0.20242 (first cell) represents the probability of maternal health care use in pregnancy complications for women who were not involved in any decision making, who do not know the danger signs of pregnancy complications, whose husbands have low education and whose husbands do not accompany them on antenatal care visits. In other words, it is the probability for women with code zero in all the significant variables.

Table 7
PROBABILITY TO USE MATERNAL CARE TO TREAT PREGNANCY COMPLICATIONS BY WOMEN'S CHARACTERISTICS (ESTIMATED FROM LOGISTIC REGRESSION IN MODEL 6)

Women Characteristics				Husband's education (X_9)			
				No education or primary education ($X_9 = 0$)		More than primary education ($X_9 = 1$)	
				Husband accompanies during antenatal care (X_6)		Husband accompanies during antenatal care (X_6)	
				No ($X_6 = 0$)	Yes ($X_6 = 1$)	No ($X_6 = 0$)	Yes ($X_6 = 1$)
(1)				(2)	(3)	(4)	(5)
Women's involvement in decision making (X_3)	Not involved in any decision ($X_3 = 0$)	Knows the danger signs of pregnancy complications (X_7)	No ($X_7 = 0$)	0.20242	0.88589	0.83341	0.99351
			Yes ($X_7 = 1$)	0.33099	0.93802	0.90700	0.99666
	Involved in all 4 types of decision ($X_3 = 1$)	Knows the danger sign of pregnancy complication (X_7)	No ($X_7 = 0$)	0.68995	0.98552	0.97771	0.99926
			Yes ($X_7 = 1$)	0.81266	0.99252	0.98844	0.99962

Source: Calculated from logistic regression Model 6 (Tables 6).

It is obvious that husbands can play a highly significant role in the utilization of maternal health care to treat pregnancy complications. This appears from the combination of husbands' better education and husbands' companionship for antenatal care that produce a higher probability for the women to go to professional health providers, regardless of the women's position with respect to the other variables (see the last column in Table 7). Women's involvement in decision making also emerges as an important variable to increase their chances of utilization of maternal health care. However this variable may be less powerful than husbands' involvement in maternal health care or husbands' education.

10. CONCLUSION

This analysis aimed to identify the most important variables influencing women's health seeking behavior by pregnant women who had experienced pregnancy complications in the five years preceding the survey. Ten variables representing women's empowerment, husbands' involvement in maternal health care, women's knowledge about pregnancy complications and household economic condition were used in a multivariate analysis. The analysis identified four variables which

statistically and significantly influenced women's health seeking behavior. Those four variables are husband's education (X_9), husband's companionship for antenatal care visits (X_6), women's knowledge about danger signs of pregnancy complications (X_7), and women's involvement in decision making (X_3). Based on the odds ratios, the variable X_6 (husband's involvement in maternal health care) emerges as the most powerful determinant of the utilization of maternal health care. The variables X_9 (husband's education) and X_3 (women's involvement in decision making) appear as the second and third most important determinants respectively, of women's health seeking behavior during pregnancy complications. Women's knowledge about danger signs of pregnancy complications (X_7) appears to be the weakest variables explaining health their seeking behavior.

The results of the logistic regression analysis also show that, in Indonesia in 2002-2003, husbands appear to play very important roles in women's health seeking behavior. Husbands' education (variable X_9) and husbands' involvement in maternal health care (variable X_6) emerge as significant variables and provide the largest contribution to the logistic regression model. Pregnant women, whose husbands score the highest on these two variables, have the largest probability of utilizing health care services during pregnancy complications. It has been argued that husbands' education (variable X_9), which determines their (husbands') occupation and income, has a major influence in determining the household economic condition. Therefore, the combination of variables X_6 and X_9 reflects both the economic status of the household and the husband's concern for maternal health care. It is not surprising, therefore that these two variables emerge as the most powerful determinants of women's health seeking behavior, particularly since women's empowerment in Indonesia is very low. Women do not have sufficient access to economic resources, which is apparent from their small involvement in economic activities and low capability to make decisions about large purchases. As a consequence women still depend on their husbands or some other family member for major decisions including those on utilization of maternal health care. Even in a situation of generally low levels of women's empowerment, their capability to make decisions (variable X_3) and their awareness of pregnancy complications (variable X_9) are very important factors influencing their health seeking behavior.

11. POLICY IMPLICATIONS

The analysis done in this study have some important policy implications for enhancing women's health and reducing maternal mortality in Indonesia. Firstly, it is very crucial to improve husbands'

involvement in maternal health care. Husbands' care would ensure that women obtain appropriate treatment or health services during their pregnancy, at delivery and during the post-natal period. But how to make the husbands involved actively in maternal health care? It is also important to know whether the husbands realize that their care is important for their wives' health and how far the husbands understand their wives' health needs. Since it is shown that the husbands have low understanding about maternal health it seems that they also do not know the significance of their care and the needs of women. Therefore, to increase the husbands' involvement in maternal health care, their knowledge should be improved. This can be done by using national campaigns through popular media such as advertisements in television and newspapers. The Indonesian government actually has implemented such a program through the National Family Planning Coordinating Board (BKKBN). Several years ago the campaign about alert husbands (*Suami Siaga*) was widely publicized in television and newspaper. Shefner-Rogers and Sood (2004) mentions that the alert husband campaign was effective to improve their awareness about their role in maternal health care. However husbands' awareness about their important role for maternal health care such as birth preparedness actions is not sufficient if it does not include their knowledge about health problems during pregnancy. Husbands' awareness can be transferred into precise actions if they know when the women need their help. Therefore, the health intervention programs (both governmental and non-governmental) should enrich the material of their campaigns on information, education and communication (IEC) by including full information about the signs and symptoms of pregnancy complications and how the husbands can help by seeking both preventive and curative treatment from professional health service providers. A complementary approach would be to encourage professional health providers to present useful information on maternal health care to their patients and their husbands. However, the IDHS 2002 data show that husbands who have talked to medical personnel do not have sufficient knowledge about women's health, which implies that the professional health providers should be proactive in giving health care information to the husbands of pregnant women.

This study reveals that women's knowledge about pregnancy complications determines their utilization of maternal health care. Therefore, the IEC campaigns and enhancement of the roles of professional health providers should include not only the husbands but also the women. Like their husbands, the women must also understand the danger signs of pregnancy complications, so that they know when to seek professional health care to prevent any complications. Besides, knowledge about health problems can positively influence the women to perceive the need for treatment. If there is no demand for treatment, then no action may be taken to provide the needed services. Although not specifically

addressed in this study, the study findings also imply a number of health seeking behavior and practices on the part of both the women and their husbands that are not conducive to safe maternal health. Therefore, it is important also to consider introducing behavior change communication (BCC) to the women and their husbands.

It should be noted that the suggestions to improve husbands' involvement in maternal health care are not intended to create more dependency of the women on their husbands, rather the husbands' involvement is intended to provide a strong complement to women's own decision making for their health care.

On the other hand, an important policy recommendation of this study is to improve women's empowerment, as it has been shown that women's involvement in decision making to significantly influences their utilization of maternal health care. In this case women's involvement in decision making represents a direct effect of women's empowerment on maternal health care utilization. Although some of the indicators of women's empowerment are not found to be significant determinants of women's health seeking behavior, it does not necessarily mean that an improvement in women's empowerment would not be worth doing. On the whole, women's empowerment has been found to significantly explain the utilization of maternal health services during antenatal, delivery or postnatal periods. Appropriate programs should be implemented to improve women's empowerment such as increasing their education, enhancing their awareness of their rights to education, decision-making and health care, and reducing gender inequality. In order to achieve these goals, programs should be aimed at creating gender sensitive development planning which accommodates women's needs.

In summary, it is recommended that policies should be directed to act on three fronts:

- improve women's knowledge about maternal health problems and pregnancy complications and continue with the process of women's empowerment, especially with respect to decision making about health care;
- improve husbands' knowledge about maternal health problems and pregnancy complications and enhance their active involvement in their wives' health care; and
- Enhance the roles of professional health care providers so that they give appropriate maternal health care information to the women and their husbands.

All three aspects of the policy should be pursued simultaneously to achieve an integrated maternal health care system in Indonesia.

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