



**MILLENIUM DEVELOPMENT GOAL FIVE  
ON MATERNAL HEALTH IN INDONESIA, 2007**



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## ABSTRACT

**Rationale:** Maternal mortality in Indonesia is very high compared to global and ASEAN regional levels. The Government of Indonesia has joined many other countries in adopting the Millennium Development Goal 5 (MDG 5) to improve maternal health along with striving to achieve other developmental goals. However, if the current annual rate of change in maternal health measures is disaggregated to urban-rural levels, it can be seen that the progress towards MDG 5 has been different in these areas from that achieved at the national level. Furthermore, little is known about the factors which significantly affect the achievement of the current progress in the maternal health indicators between the urban and rural areas of Indonesia.

**Objective:** Prompted by the uneven achievement in meeting maternal health goal in urban and rural areas of Indonesia, the present study aims to investigate the factors contributing to such variations in meeting MDG 5 and provide an evidence-based approach for suitable policy designs.

**Design:** This study is based primarily on an original analysis of data derived from the Indonesian Demographic and Health Survey 2007 (IDHS 2007). The proportion of deliveries attended by skilled birth attendants (SBAs) has been selected for analysis. The data have been analysed in three stages - descriptive, bivariate and multivariate analyses.

**Findings:** The present study confirms that rural women in Indonesia have a statistically significantly lower chance of having their deliveries attended by SBAs compared to their urban counterparts. The factors, which contribute to a high predicting power of the chances of deliveries attended by SBAs include place of delivery and whether or not a woman has received antenatal care (ANC) from a health provider.

**Conclusion:** Based on the findings mentioned above, strategic and appropriate policy and research implications are discussed.

## INTRODUCTION

One of the most striking discrepancies in health characteristics between developed and developing countries is with respect to maternal mortality. Data from the United Nations (UN) agencies show that of an estimated 529,000 maternal deaths in the world in 2000, 95 % occur in the developing countries of Asia and Africa; 4 % take place in Latin America and the Caribbean; and less than one per cent arises in the more advanced countries (United Nations Population Fund 2003). When the global number of maternal deaths is disaggregated by countries, it is found that of the nine countries<sup>1</sup> estimated to have the highest incidence of maternal death in 2005, Indonesia occupies the sixth position (World Health Organization et al. 2007). In comparison with the Association of Southeast Asian Nations (ASEAN) group of nations, in 2000, Indonesia had the fourth highest Maternal Mortality Ratio (MMR), which was lower than only the People's Democratic Republic of Laos, Cambodia and Myanmar (See Table 1).

Given these realities at both the global and regional levels, Indonesia has made several concerted efforts to reduce maternal mortality in the country (Departemen Kesehatan RI et al. 2005). In 2000, the President of Indonesia, together with other heads of state, reaffirmed the United Nation Millennium Declaration which aimed to improve maternal health status in conjunction with other developmental goals (United Nations 2005). The target for the maternal health goal is to reduce the MMR by three quarters between 1990 and 2015. The success of this will be measured by two indicators, namely, the MMR and the proportion of births attended by skilled health professionals. However, according to the World Summit 2005 (WHO 2008, p. 1), these indicators are considered to be inadequate in reflecting the plural nature of maternal health. In the short term, another target is integrated under the Millennium Development Goal 5 (MDG 5) and it is to achieve by 2015, universal access to reproductive health (United Nations 2005). Several indicators are then encapsulated into the MDG monitoring framework and they

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<sup>1</sup> The countries with the highest estimated number of maternal deaths are India (117,000), followed by Nigeria (59,000), Afghanistan (26,000), Ethiopia (22,000 each), Bangladesh (21,000), Indonesia (19,000), Pakistan (15,000), Niger (14,000), Congo (13,000 each) (WHO et al. 2007).

consist of: increasing the Contraceptive Prevalence Rate (CPR) and Antenatal Care (ANC) coverage and reducing the adolescent birth rate and unmet need for family planning. According to WHO (2008 p. 7), the terms of ‘universal access’ in this context is somewhat intangible but in the broad sense it is similar to ‘equitable access ‘; that is, equal access for people with equal need.

In the past, efforts have been made by the Indonesian Government to reduce the MMR. As a response to the adoption of the Safe Motherhood Initiative of the 1980s, huge numbers of midwives were trained and posted throughout villages in Indonesia (Departemen Kesehatan RI et al. 2005, p. 17 & Iskandar et al. 1996, p. 19). By the end of 1996, a new campaign called *Gerakan Sayang Ibu* (GSI) or the Mother Friendly Movement was announced (Departemen Kesehatan RI et al. 2005, p. 7). The main objectives of this movement were to build Mother Friendly Hospitals and create public awareness campaigns like those of the ‘Alert husbands’ (*Suami Siaga*) and ‘Alert midwife’ (*Bidan Siaga*) programs. To further reduce the MMR, a National Strategic Plan on Making Pregnancy Safer (MPS) was introduced in 2000, the focus of which was to provide Skilled Birth Attendants (SBAs) and to create sustainable health services at all villages in Indonesia (Departemen Kesehatan RI 2003, p. 11 & Departemen Kesehatan RI et al. 2005, p. 7).

**Table 1. Maternal mortality in the ASEAN region, 2000**

No.	Country	MMR
1	Laos PDR	650
2	Cambodia	450
3	Myanmar	360
4	Indonesia	230
5	The Philippines	200
6	Thailand	44
7	Malaysia	41
8	Brunei Darussalam	37
9	Singapore	30

Source: ESCAP, United Nations 2007

Indonesia has identified targets and indicators for monitoring the country's progress toward the MDG 5 on maternal health (Table 2). These targets consist of two sets- one laid down by the Ministry of Health (Departemen Kesehatan) and the other by the National Family Planning Coordinating Board (*Badan Koordinasi Keluarga Berencana Nasional, BKKBN*). The former targets comprise reducing the MMR; increasing the percentage of both births attended by the skilled health personnel and the number of pregnant women who receive ANC from a health professional, as well as the management of obstetric complications at health facilities (Departemen Kesehatan RI et al. 2005, p. 54). These indicators are mostly formulated in line with Ministry of Health's vision to achieve 'Indonesian Health by 2010'. Meanwhile, reducing the TFR, unmet need and increasing the median age at first marriage for females are targets determined by the BKKBN which are stated in the Medium Term National Development Plan (*Rencana Pembangunan Jangka Menengah, RPJM*) for 2005-2009 (BKKBN 2006 p. 51).

**Table 2. Targets and indicators of MDG 5 in Indonesia**

Global goal	Global target	Indonesia's targets	Indonesia's indicators
Goal 5: Improve maternal health	Reducing maternal mortality ratio by three quarters between 1990 and 2015	Reducing maternal mortality ratio to 125 per 100,000 live births by 2010 <sup>a</sup>	MMR (deaths per 100,000 live births)
		Increasing the percentage of births attended by the skilled health personnel to 90 % by 2010 <sup>b</sup>	Percentage of births attended by the skilled health personnel
	Achieving universal access to reproductive health by 2015	Increasing the percentage of pregnancies receiving ante natal care from a health professional to 95 % in 2015 <sup>a</sup>	Percentage of pregnancies receiving ante natal care from a health professional
		Increasing the percentage of managing obstetric complications at health care facilities to 80 % by 2010 <sup>a</sup>	Percentage of obstetric complications managed at health care facilities
		Reducing the Total Fertility Rate (TFR) to 2.2 by 2009 <sup>d</sup>	TFR
		Reducing unmet need for family planning to 6 % by 2009 <sup>d</sup>	Unmet need for spacing and limiting
		Increasing the Contraceptive Prevalence Rate (CPR) of any modern method to 70 by 2009 <sup>e</sup>	CPR
		Increasing the median age at first marriage for females at 21 years old by 2009 <sup>d</sup>	Median age at first marriage

<sup>a</sup>Departemen Kesehatan RI 2003; <sup>b</sup> National Development Planning Agency 2005; <sup>c</sup> Departemen Kesehatan RI et al. 2005; <sup>d</sup>BKKBN 2008 & <sup>e</sup> Departemen Kesehatan RI nd

Sources: BKKBN 2008; Departemen Kesehatan RI 2003; Departemen Kesehatan RI et al. 2005; Departemen Kesehatan RI nd and National Development Planning Agency 2005.

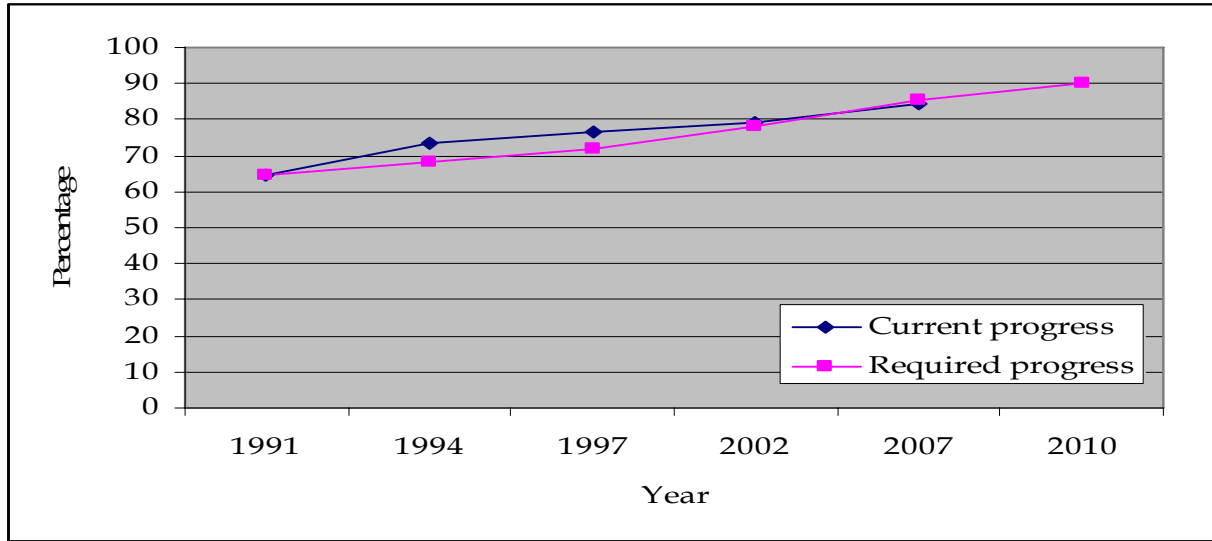
So far, Indonesia has made significant progresses in some targets half way through the agreed deadline of 2015. Two series of progress reports on MDG 5 for 2004 and 2005 have been published (National Development Planning Agency 2004 & 2005). Table 3 indicates a satisfactory progress in particular indicators but not in others. However, if the level at urban and rural areas is disaggregated, the situation is quite dissimilar (See Appendices 1 and 2).

Specifically for the proportion of birth attended by skilled personnel, at urban area, the latest progress tends to be lower than the required progress and at rural area, the progress shows an impressive trajectory but is still far behind the target (See figure 1 & 2).

**Table 3. Progress in achieving Millennium Development Goal 5 in Indonesia**

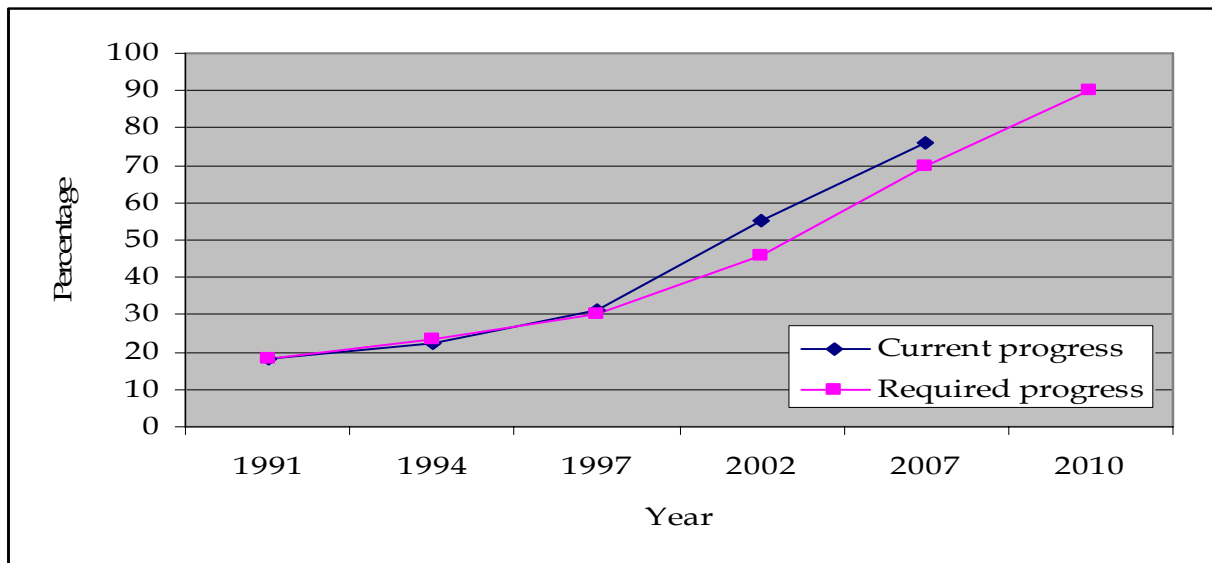
Targets	Indicators	Rate in the base year 1991	Goal year 2010	Required annual rate of change (%) <sup>*</sup>	Rate in the current year 2007	Current annual rate of change (%) <sup>*</sup>
Reducing maternal mortality ratio by three quarters	MMR (maternal deaths per 100,000 live births)	421 <sup>a</sup>	125	6.75	228	4.09
	Proportion of births attended by a skilled health personnel	31.7	90	5.49	79.4	5.74
Achieving by 2015, universal access to reproductive health	Percentage of pregnant women receiving ANC from a health care professional	76.3	95 <sup>b</sup>	0.91	93.3	1.26
	Proportion of obstetric complications managed at health care facilities	n.a	80	n.a	n.a	n.a
	TFR	3.02	2.2 <sup>c</sup>	1.76	2.6	0.94
	Unmet need for spacing and limiting	12.7	6 <sup>c</sup>	4.17	9.1	2.08
	CPR (any modern method)	47.1	70 <sup>c</sup>	2.20	57.4	1.24
	Median age at first marriage for females (25-49)	17.7	21 <sup>c</sup>	0.95	19.8	0.70

**Figure 1. Progress in achieving the target for skilled birth attendance by 2010, Indonesia, Urban: 1991-2007**



Source: Calculated by the author from the given data: Central Bureau of Statistics et al. 1992; 1995; 1998 and Statistics Indonesia et al. 2003 and 2007

**Figure 2. Progress in achieving the target for skilled birth attendance by 2010, Indonesia, Rural: 1991-2007**



Source: Calculated by the author from the given data: Central Bureau of Statistics et al. 1992; 1995; 1998 and Statistics Indonesia et al. 2003 and 2007

The present study aims to investigate the proportion of assistance during delivery by health care professionals and its contributor factors. The reason why this particular indicator is chosen above the others is based on the most critical intervention for making motherhood safer in Indonesia that is to ensure the presence of professional providers at every birth (Departemen Kesehatan RI 2003 p. 11 & Departemen Kesehatan RI et al. 2005, p. 7). This effort emerges as a vital investment as the Ministry of Health (Departemen Kesehatan RI 2008, p. 161) reports that the occurrence of maternal mortality in Indonesia overwhelmingly takes place during the onset of labor by which the presence of SBAs can contribute significantly to the prevention of unnecessary deaths.

## **METHODOLOGY**

This study is based primarily on an original analysis of secondary data, which have been derived from the IDHS 2007. The unit analysis is women who had their last live birth in the five years preceding the survey. The dependent variable is the proportions of births assisted by health professionals. Meanwhile, the selected independent variables are based on their expected relationship with the dependent variables as indicated from a growing body of literature and other findings (See McCarthy & Maine 1992; Thaddeus & Maine 1994; Claeson et al. 2001 cited in Nanda, Switlick & Lule 2005; UNFPA 2005; United Nations 2007; Koblinsky, Campbell & Heichelheim 1999; Furuta & Salway 2006). In this study, the data are classified according to three different analyses: descriptive, bivariate and multivariate analyses and are performed with Statistical Package for the Social Sciences (SPSS) version 15 with prescribed weights. The datasets are first made and recoded (See Table 4).

**Table 4. Variables, indicators and operational definitions of skilled birth attendance during delivery: Urban and rural**

Variables	Indicators	Operational definitions
Dependent variable		
Skilled birth attendance during delivery	Whether or not a delivery was performed by a skilled health personnel	Delivery performed by unskilled health personnel=0
		Delivery performed by a skilled health personnel=1
Independent variables		
Intermediate variables	Health care behavior	
	ANC	Whether or not a woman received ANC from a health provider
		Did not receive=0
		Received=1
	Place of delivery	Whether a delivery took place at a health facility or at home
		At home=0
		At health facility=1
	Access to health services	
	Physical access to health facilities	Whether or not a woman considered distance was a big problem to obtain maternity services
		A big problem=0
		Not a big problem=1
		Whether or not a woman considered transportation was a big problem to obtain maternity services
A big problem=0		
Not a big problem=1		
Distant variable	Education of the woman	The highest level of education completed by a woman
		Primary or below=0
		Secondary or above=1

## FINDINGS

### Descriptive Analysis

This section presents the findings of the analysis of selected variables based on descriptive statistics. The main focus is to describe the frequency distribution of each variable.

To a large extent, the ever married women who had their last live birth in the five years preceding the survey in urban and rural areas exhibited similar profiles according to their socio-demographic backgrounds and maternity care (See Table 5). More than two thirds of these women were aged between 15-34 years old, with rural women being slightly younger on average. Many of the most recent births both in the urban and rural areas were assisted by professionally SBAs; more than 90% of urban and rural women visited ANC; and most women did not perceive distance and transportation as being an issue in seeking health providers for attending their births. However, there were some women in both the areas who considered physical accessibility as an important barrier to accessing professional maternity care. Their proportion was three times as large in rural areas compared to urban areas. The mean number of living children was slightly higher in the rural areas and urban women were better educated than their rural counterparts. In terms of place of delivery, nearly two thirds of the births occurring in the last five years in urban areas took place at health centers compared to less than a third (31%) of the births occurring in the rural settings.

**Table 5. Percentage distributions of ever married women who had their last live birth in the five years preceding the survey by socio-demographic characteristics, health seeking behavior and access to health facility, Urban and rural areas, Indonesia, 2007**

Characteristics	Percentage (%) and number of women (N)			
	Urban		Rural	
	%	N	%	N
◎ Age				
15-34	74.7	4,404	75.8	6,177
35-49	25.3	1,493	24.2	1,969
◎ Number of living children				
2 or less	69.5	4,097	65	5,294
3 or more	30.5	1,800	35	2,852
Mean/Standard Deviation	2.17/1.416		2.32/1.483	
◎ Women's education				
Primary or below	28.9	1,705	55.7	4,535
Secondary or above	71.1	4,192	44.3	3,610
◎ Assistance during delivery				
Unskilled	7.7	454	27.3	2,223
Skilled	92.3	5,444	72.7	5,923
◎ ANC by health providers				
Did not received	2.3	133	9.9	810
Received	97.7	5,764	90.1	7,335
◎ Place of delivery				
Home	28.2	1,665	68.4	5,574
Health facility	71.6	4,223	31.1	2,534
◎ Physical accessibility to health facility				
◎ Whether or not the woman considered distance was a big problem				
A big problem	8.1	478	22.7	1,848
Not a big problem	91.8	5,413	77.1	6,283
◎ Whether or not the woman considered transportation was a big problem				
A big problem	6.4	375	19.9	1,619
Not a big problem	93.5	5,517	79.9	6,512

Source: Calculated by the author from IDHS 2007 Dataset

## **Bivariate analysis**

### **1. The proximate determinants**

In terms of health care utilization, in both urban and rural areas, receiving ANC and delivering at a health facility are found to be significantly related to the availability of health care providers during delivery. However, the odds ratio for each of these two variables is higher in the urban areas as opposed to rural areas (Table 6). In urban areas, women who had received ANC during pregnancy were 13 times more likely to have had their deliveries attended by qualified attendants compared with women who had not received ANC. In rural areas, the corresponding odds of having births assisted by medical professional were 7 to 1 between receiving ANC and receiving no ANC. This finding suggests that even during their pregnancy, rural women were medically checked-up through ANC visits; the propensity for their deliveries to be supervised by health care professionals is almost two times less than those of corresponding urban women.

One would expect place of delivery to be a major proximate determinant of the type of delivery assistance. This is probably true for Indonesia where deliveries taking place at health care institutions increase the likelihood of the presence of qualified providers. Table 6 shows that, in urban areas, the odds of deliveries being managed by health care professional were 124.5 times more when deliveries occurred in health care facilities than when deliveries were managed at home. The corresponding odds in the rural areas were 101 to 1, again showing a smaller likelihood of skilled birth attendance in rural zones.

From the analysis of physical access to appropriate health services, all the selected variables demonstrate significant relationships with assistance during delivery (Table 6). Among rural women, those who thought that distance and transportation were not major obstacles to accessing health care services were only half as likely to have their deliveries assisted by medical attendants compared to those women who thought that distance and transportation were obstacles. This pattern is similar for urban women in relation to the distance variable, but with respect to transportation, there was practically no difference in

the odds of having skilled birth attendants during delivery regardless of whether or not the women felt that transportation was a big problem.

**Table 6. Chi-square test and odds ratios of association between the determinants of assistance during delivery and assistance during delivery, Urban and rural areas, Indonesia, 2007**

The determinants	Assistance during delivery (Odds of having skilled birth attendants during delivery)			
	Urban		Rural	
	Chi-square	Odds ratios	Chi-square	Odds Ratios
<b>Proximate determinants:</b>				
<b>A. Health care behavior</b>				
Whether or not a woman received ANC (Reference: Did not receive ANC)	325.533 (p:.000)	13.244	741.033 (p:.000)	7.086
Whether a delivery took place at a health care facility or at home (Reference: Did not deliver at a health care facility)	1139.708 (p:.000)	124.491	1300.998 (p:.000)	100.627
<b>B. Access to health services</b>				
Whether or not a woman considered distance was a big problem (Reference: Distance was not a big problem)	37.611 (p:.000)	0.435	165.679 (p:.000)	0.489
Whether or not a woman considered transportation was a big problem (Reference: Transportation was not a big problem)	93.071 (p:.000)	0.283	191.836 (p:.000)	0.451
<b>Distant determinant:</b>				
The highest level of education completed by a woman (Reference: Primary or below)	256.850 (p:.000)	4.537	514.243 (p:.000)	3.437

Source: Calculated by the author from IDHS 2007 Datasets

## 2. The distant determinant

The only distant variable considered here is that of women's education. It exerts a significant relationship with skilled birth assistance during delivery, but the odds ratios are not large in either the urban or rural areas (Table 6). In both urban and rural areas, more educated women have a greater likelihood of having their births attended by medically qualified personnel than less educated women do. The advantages of the higher educated women over their less educated counterparts are more pronounced in the urban areas.

### Multivariate analysis

In this analysis, only the variable representing distance variable does not retain its significant relationship, both in the urban and rural areas. For this reason, this variable has been excluded from further analysis and the discussion below refers to the model in which all the variables are statistically significant to the dependent variable.

For the selected proximate variables demonstrating positive relationships with the assistance during delivery, place of delivery provides a greater likelihood of skilled delivery assistance than ANC visit, in both the urban and rural areas, as indicated by the values of the respective odds ratios (Table 7). This is consistent with the results of the bivariate analysis which also showed that women delivering at health facilities had a greater chance of having their deliveries assisted by professional attendants than did women with prior ANC visits. Further, as Table 7 shows, the advantages in getting deliveries supervised by a health professional, either because of delivering at health facilities or because of prior ANC visits are always greater in the urban than in the rural areas. In the meantime, the odd ratios for the other proximate determinant (transportation) exhibits negative relationship (Table 7). Women who consider transportation as a serious obstacle have a lower chance of having professional services during delivery than women who do not perceive it as an important barrier. However, the odds ratios of urban and rural women stating that transportation is a serious problem not receiving skilled delivery attendance are less than unity. Furthermore, it appears that rural women perceiving transportation as a serious obstacle to get medical helps during delivery have a slightly higher

chance than urban women to have their deliveries managed by SBAs. Taken together all these results, it confirms the bivariate findings suggesting that: (1) a probability of rural women to have health professional in attendance at health care facilities is moderately below the urban probability; (2) a fewer tendencies of rural compared to urban women who underwent ANC during pregnancy to seek medical professional services at the time of delivery; (3) women who live in the urban areas encounter a slightly higher difficulty in accessing professional assistance due to transportation matters.

For the distant variable, Table 7 shows that the odds of receiving medical attendants are better for women with higher education than for women with lower education. Further, the odds are greater in the rural areas than in the urban areas. Unlike bivariate analysis, this result demonstrates that there are higher opportunities for educated women in the rural areas to enjoy medial services at the time of childbirth.

**Table 7. Final estimates of  $\beta$  coefficients (B) and odds ratios on assistance during delivery, urban-rural areas, Indonesia, 2007**

The determinants	Assistance during delivery (Odds of having skilled birth attendants during delivery)			
	Urban		Rural	
	B	Odds ratios	B	Odds ratios
Proximate determinants:				
A. Health care behavior				
Whether or not a woman received ANC (Reference: Did not receive ANC)	1.640 (p:.000)	5.157	1.295 (p:.000)	3.651
Whether a delivery took place at health facility or at home (Reference: Delivery took place at home)	4.620 (p:.000)	101.491	4.316 (p:.000)	74.922
B. Access to health services				
Whether or not a woman considered transportation was a big problem (Reference: Transportation was not a big problem)	-.761 (p:.000)	.467	-.450 (p:.000)	.638
Distant determinant:				
The highest level of education completed by a woman (Reference: Primary or below)	.574 (p:.000)	1.775	.799 (p:.000)	2.223
Constant	-.689 (p:.003)	.506	-.833 (p:.000)	.435

Source: Calculated by the author from IDHS 2007 Datasets

## Discussion

The analysis has shown that receiving ANC increases the likelihood of being attended by a health professional during the childbirth. But this likelihood is greater for urban women than rural women. However, compared to ANC visits by a health provider, place of delivery has a much stronger and a highly significant association with assistance during delivery. But even in

this case (i.e., delivering in a health facility) urban women have a much higher chances of being delivered with a health professional in attendance compared to rural women.

A range of reasons offered by McCarthy and Maine (1992) as well as Thadeus and Maine (1998) can possibly explain the lower likelihood of skilled birth attendance for the rural, even though they have been sensitized to the formal health system through ANC visits or being delivered in a health facility. These reasons could include continuing traditional beliefs and practices favoring Traditional Birth Attendants (TBAs), low level of women's status in the family and the community due to which it is considered not important enough for them to have a health professional attendance during delivery, cost-related considerations or poor perceived quality of care in rural areas. The issue of longstanding reliance of rural women to the TBAs during delivery process might partly due to the number of TBAs which is still considerable in the rural areas or as indicated by Starrs (1997, p. 30), they are more desirous of assisting childbirth. Further, even though there may be sufficient numbers of SBAs in the rural areas in terms of ratio per head of the rural population (Hatt et al. 2007, p. 779), the low utilization of SBAs among rural women is probably due to the inaccessibility of medical personnel when their services are needed. This argument is supported by a research conducted by Makowiecka et al. (2007, p. 5) demonstrating that assigned midwives in rural Pandeglang and Serang districts of Banten provinces spend less days per month in clinical works compared to urban assigned providers.

Turning to physical accessibility factors, distance variable has been observed to have lost its influence on SBAs when all the selected variables are examined simultaneously in the multivariate analysis. In the meantime, transportation appears to be the least likely factor to determine the usage of skilled medical care in both the urban and rural areas. However, compared to the women who did not consider transportation as a barrier, women who did think it was a problem were almost half as likely to have their deliveries supervised by professional providers in the urban areas and two-thirds as likely in the rural areas. The slightly

higher odd ratio in the rural areas in the present study is not explainable with current data and it is not of much significance.

For the selected distant variable, the analysis demonstrates that the higher the level of women's education, the better is the opportunity for women to have deliveries supervised by medical attendants. However, the bivariate and the multivariate analyses show an inconsistency in the odds ratios between urban and rural women. In the bivariate analysis, a higher odds ratio is found for the urban women, whereas, in the multivariate analysis, a higher odds ratio is observed for the rural areas. While there may be a possible statistical reason to explaining this irregularity (such as a multicollinearity), there is another explanation towards the result obtained from the multivariate analysis which is arguably more reliable in predicting the presence of SBAs compared to the bivariate findings. Since the likelihood is greater that higher educated women living in rural settings receive SBAs compared with their comparable urban counterparts, this result indicates that the difference in likelihood to seek SBAs between the lower and the better educated women is higher in the rural areas. If that is so, it is probably because in the rural areas, health-related information channeled through non formal education is often limited. It is more likely that maternal health information is accessible through formal education that can only be enjoyed by women with a higher level of education and leave those uneducated women with limited knowledge and awareness. In contrast, in the urban areas, such information is argued to be readily accessible both in the form of formal and non-formal education. As such, urban women with different educational backgrounds can access this information relatively easily and this allows a smaller difference in the health-seeking behavior between the lower and the better educated women.

## **Conclusion**

The findings of the analysis clearly demonstrate that there are several factors underlying the different picture of urban and rural areas in relation to the progress of SBAs. Contrasting the results obtained from the analysis between urban and rural areas, it is observed that the chance of rural women having their deliveries accompanied by professional attendants is less than

those of urban women. A statistical analysis quantifying the relationship between assistance during delivery and its related factors for both the urban and rural areas reveals that place of delivery has a strong influence in predicting whether a delivery is attended by health providers or not. This, in turn, is followed in order by the status of ANC visits and women's education. The influence of physical access to health care facilities does not appear to have much impact on the presence of SBAs, nor does it provides much difference in the likelihood of deliveries attended by SBAs between urban and rural women.

### **Policy and research implications**

This study has revealed that place of delivery has a very strong influence in determining the presence of SBAs at the time of birth. In order for pregnant women to have universal access to qualified and accredited birth attendants by 2010, it is very important to ensure that all women who are due to give birth are brought to a health facility, thereby saving the lives of mothers and their newborns. This health facility nevertheless must be installed in a functioning health system including a strong referral system that offers service on a 24-hour basis (Starrs 1997, p. 45). Another factor observed to be critical to ensure the employment of SBAs is that pregnant women should have ANC from health providers. However, as the present analysis has shown a gap between receiving ANC and having SBAs (for example in urban areas, 97.7% women received ANC while 92.3% received SBAs), this pattern is confirmed by Rooney (1992, p. 12) disclosing that in most developing countries where maternal mortality remains unacceptably high, far more women receive medical services during pregnancy than are delivered with trained attendants. In relation to this, the present study has shown that rural women are proven to suffer more than their urban counterparts because proportionately fewer of them receive ANC and fewer still obtain SBAs compared to urban women. Based on this fact, it is recommended that a larger proportion of pregnant women, particularly in the rural areas, should be reached under the ANC program. Since UNFPA (2003, p. 6) states that the greatest numbers of maternal deaths take place among women considered to be low-risk, the ANC program should be based on the principle that every pregnant woman is at risk of developing

life threatening complications. The focus for addressing maternal mortality should thus be shifted from predicting complications during pregnancy to preparing efficient and safe delivery.

In order to fully understand the gravity of maternal health problems in Indonesia by which the population of concern might include all women in their reproductive years, this current study might under-represent the whole picture of maternal health by only focusing on ever married women aged 15-49. Therefore, it is suggested that a study of SBAs in Indonesia be expanded by incorporating other relevant dimensions and by including all women in their reproductive years regardless of their marital status.

Considering the unexpected result attained from the analysis between physical access (transportation), and medical assistance during delivery in both urban and rural areas, the questions set in IDHS 2007 regarding this issue are argued to be not specific. To have a better understanding of this relationship, it is important for future surveys to separate the question regarding transportation and maternity services with respect to ANC, assistance during delivery, and post partum care. To avoid the subjectivity of the question, it is also necessary to complement this question with accurate information about the travel distance and the type of transportation used by the local people to transport women from their homes to the health centers.

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## Appendix

### 1. Progress in achieving Millennium Development Goal 5 at urban areas

Targets	Indicators	Rate in the base year 1991	Goal year 2010	Required annual rate of change (%)*	Rate in the current year 2007	Current annual rate of change (%)*
Reducing maternal mortality ratio by three quarters	MMR (deaths per 100,000 live births)	n.a	n.a	n.a	n.a	n.a
	Proportion of births attended by a skilled birth personnel	64.7	90	1.74	84.3	1.65
Achieving by 2015, universal access to reproductive health	Percentage with ante natal care from health professional	92.2	95	0.16	97.7	0.36
	Proportion of obstetric complications managed at health care facilities	n.a	80	n.a	n.a	n.a
	TFR	2.6	2.2	0.93	2.3	0.77
	CPR (any modern method)	55.7	70	1.27	57.1	0.16
	Unmet need for spacing and limiting	10.5	6	3.11	8.8	1.10
	Median age at first marriage for female (25-49)	19.1	21	0.527	21.3	0.681

\* Calculated from the given data

Sources: BKKBN 2008; Central Bureau of Statistics et al. 1992; 1995; 1998; Departemen Kesehatan RI 2003; Departemen Kesehatan RI et al. 2005; Departemen Kesehatan RI nd; National Development Planning Agency 2005 and Statistics Indonesia 2003 and 2008

## 2. Progress in achieving Millennium Development Goal 5 at rural level

Targets	Indicators	Rate in the base year 1991	Goal year 2010	Required annual rate of change (%)*	Rate in the current year 2007	Current annual rate of change (%)*
Reducing maternal mortality ratio by three quarters	MMR (deaths per 100,000 live births)	n.a	n.a	n.a	n.a	n.a
	Proportion of births attended by a skilled birth personnel	18.2	90	8.41	75.9	8.92
Achieving by 2015, universal access to reproductive health	Percentage with ante natal care from health professional	69.9	95	1.61	90.1	1.59
	Proportion of obstetric complications managed at health care facilities	n.a	80	n.a	n.a	n.a
	TFR	3.24	2.2	2.15	2.8	0.91
	CPR (any modern method)	47.2	70	2.19	57.5	1.23
	Unmet need for spacing and limiting	13.6	6	4.55	9.2	2.44
	Median age at first marriage for females (25-49)	17.1	21	1.141	18.7	0.59

\* Calculated from the given data

Sources: BKKBN 2008; Central Bureau of Statistics et al. 1992; 1995; 1998; Departemen Kesehatan RI 2003; Departemen Kesehatan RI et al. 2005; Departemen Kesehatan RI nd; National Development Planning Agency 2005 and Statistics Indonesia 2003 and 2008

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