

# *Suami SIAGA*: male engagement in maternal health in Indonesia

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## Abstract

*Suami SIAGA*, which translates literally as the 'alert husband', is a national campaign that was created in early 2000 to promote male participation in maternal and child health program in Indonesia. The purpose of this study was to identify the proportion of men who took part in *Suami SIAGA* and the factors associated with their participation using the 2012 Indonesia Demographic and Health Survey (IDHS). This study also examined the relationship between *Suami SIAGA* and the following results related to the national campaign: the presence of husbands at antenatal care (ANC) units and the place of delivery at health facilities. Data on the characteristics of husbands and wives, as well as other related factors, the perceived elements of *Suami SIAGA*, and the national campaign outcomes were obtained from a total of 1256 eligible male subjects, drawn from the matched couples' data set. The data was analysed using bivariate and multiple logistic regression to test the associations. This study found that 86% of the respondents were categorised as *SIAGA* husbands. After controlling all the variables, age and education of wife factors were significantly associated with *Suami SIAGA*, especially in the group of women aged 41–49 years old (OR = 2.4, 95% CI: 1.1–5.5) and women with a secondary level of education (OR = 1.8, 95% CI: 1.2–2.7) and higher (OR = 2.8, 95% CI: 1.4–5.6). *SIAGA* husbands were more likely to attend their wives' ANC (OR = 2.3; 95% CI: 1.4–3.7). This study provides evidence on the benefit of husband involvement in maternal health, especially to improve ANC attendance. Empowering women themselves should also be addressed in leveraging the impact of *Suami SIAGA*.

**Keywords:** *Suami SIAGA*, male engagement, maternal health, Indonesia, *Suami SIAGA*

## Key Messages

- A high proportion of men (86%) in this study is classified as *Suami SIAGA* reflecting their willingness to involve in the birth preparedness including planning place of delivery, skilled birth attendant, delivery fund, transportation to the birth-place and blood donation.
- Wife factor is crucial in influencing the participation of male in maternal health program.
- *Suami SIAGA* is a significant predictor in improving maternal health program especially the increased male accompaniment at antenatal care visit.
- Educating male and female partners as couple is essential to promote the use of maternal health care services.

## Introduction

Improved maternal health is the fifth outcome of the Millennium Development Goals (MDGs), with two related targets by 2015: reducing the Maternal Mortality Ratio (MMR) by 75% and making reproductive health services universally accessible (United Nations, 2015). Nearly two decades after the MDGs were first adopted, the United Nations (2015) reported that the global maternal death rate was estimated to have fallen by 45%, from 380 deaths in 1990 to 210 deaths per 100 000 live births in 2013. As estimated by the World Health Organization (2015b), Indonesia saw an approximately 72% reduction in MMR from 446 in 1990 to 126 per 100 000 live births in 2015 (80% UI: 93-176). Although this reflects a significant progress, the decreased number of maternal deaths fails to meet the MDG target at 102 deaths per 100 000 live births in 2015 (Bappenas, 2012). Due to the shortfall of this MDG target, reduction of maternal mortality will continue to be one of the prominent health targets within the Sustainable Development Goals (SDGs) (World Health Organization, 2015a).

Maternal health is a key issue of gender equity and human rights, and one that enables women to achieve optimal health through the provision of a range of care covering women's life cycles (World Health Organization, 2006; Hunt and De Mesquita, 2007). Pregnant mothers should have equal rights to access affordable and quality health care, to receive health education, to be assisted by health care professional and to have adequate medication. Insufficient care for mothers during the periods of pregnancy, childbirth and after birth can increase the risk of maternal death and negatively affect their newborns (World Health Organization, 2005). An essential part of good maternal care is that men work to provide their female partners with support during this period.

Involving men is not a new strategy in maternal and child health program. In 2000 the World Health Organization (WHO) established the Making Pregnancy Safer initiative, focusing on Individuals, Families, and Communities (IFC) with the aim of empowering mothers, fathers, families and communities, and improving access to comprehensive maternal and child health care (World Health Organization, 2010). The emphasis of male engagement in maternal health is widely recognised, as men usually control and decide resources in the household, including for family health-related matters (Shefner-Rogers and Sood, 2004). However, if they are to make appropriate decisions, then men need to have sufficient knowledge about adequate maternity care and information related health facilities, available resources, and the finances needed to provide women with access to essential health care. Davis *et al.* (2013) highlighted some potential advantages of engaging men in maternal and child health issues, such as family planning and contraception, prenatal care, birth, intrapartum and postpartum care, newborn and infant health, couple relationships and reassurance for pregnant women. However, their study also noted some adverse effects of involving men in such issues. The presence of husbands/partners during Antenatal Care (ANC), for example, may prevent women from talking openly about sensitive matters, such as sexuality, various sexually transmitted infections including HIV or domestic violence (Davis *et al.*, 2013). Potential adverse effects notwithstanding, a randomised control trial study in urban Nepal found greater effects with regard to behaviour changes in relation to maternal health when the male partners were engaged in health education during antenatal care in comparison with giving such education to the woman only (Mullany *et al.*, 2007).

## Suami SIAGA and the mother friendly movement

Male engagement has also been adopted in Indonesia as a strategy to raise awareness and to increase the participation of husbands in maternal health initiatives. An urgent call for the inclusion of male partners was voiced during the initiation of the Mother Friendly Movement (MFM) that was launched by the Government of Indonesia in 1996 to promote community action in accelerating the decline of maternal mortality (Abdullah *et al.*, 1998). The MFM called on local governments to mobilise support, collect data on pregnant women to help in their deliveries, and establish mother-friendly hospitals, while also calling on husbands to be more actively involved in birth preparedness and for the couples to do more advanced planning for their pregnancies (Shiffman, 2003).

Following this movement, in 1998, the concept of *Suami SIAGA* (alert husband) was introduced nationally to advocate shared responsibility in birth preparedness (JHUCCP, 2004). This campaign aimed to educate husbands about preventing the following three delays in: (1) deciding to seek health care services when such obstetric complications arise; (2) identifying and arriving at a healthcare provider; and (3) receiving appropriate health care services (Shefner-Rogers and Sood, 2004). The term 'SIAGA' stands for 'SIap' (ready/be prepared), 'Antar' (take, transport), 'jaGA' (guard). To be a SIAGA husband, men should be prepared to support their wives in planning and attending the pregnancy, childbirth and after birth (MOWE, 2009). The ultimate actions of *Suami SIAGA* include being alert to any danger signs during pregnancy, accompanying their pregnant wives to an ANC visit, obtaining support from other family members and the community in case of emergencies, arranging blood donations, and providing transport to see health care providers, as well as safeguarding their wives during and after the delivery (MOWE *et al.*, 2003, Shefner-Rogers and Sood, 2004). Husbands are expected to discuss issues such as the appropriate birth attendants and places of delivery with their wives, communicate with health providers related to the pregnancy, encourage their wives to exercise, and save money to pay for the delivery expenses (MOWE *et al.*, 2003, JHUCCP, 2004). The Indonesia's Ministry of Health (MOH) provided a guideline on the Birth Preparedness and Complication Readiness (BP/CR), to assign village midwives with a responsibility to promote more active roles of husbands/families during ANC, childbirth and postpartum care check-up (MoH, 2009b).

An initial study of the *Suami SIAGA* campaign found a general belief that pregnancy and birth were women's business; therefore, men should be involved as little as possible. This finding caused the campaign to expand, with its message of birth preparedness being targeted primarily towards men and women of childbearing age and, subsequently, to community leaders and health personnel (Shefner-Rogers and Sood, 2004). Reviving the spirit of community self-help, the central concept of shared responsibility in the *Suami SIAGA* initiative was further evolved by introducing the notions of *Warga SIAGA* (alert citizen) and *Bidan SIAGA* (alert midwife), then *Desa SIAGA* (alert village) (JHUCCP, 2004). The purpose of *Warga SIAGA* was to encourage every citizen to be more attentive with regard to women with high-risk pregnancies, and be ready to help in emergency situations. The concept of *Bidan SIAGA* aimed to enhance the image of midwives as competent and friendly health providers in maternity care (JHUCCP, 2004). In addition to the core ideas of the *Suami SIAGA* initiative, communities in every village were also encouraged to make collective efforts in fundraising and taking care of pregnant mothers in their neighbourhoods (Hill *et al.*, 2014).

Expansion of the *SIAGA* concept to the village level led the MoH to construct *Desa SIAGA* as a village that has capacity and capability to prevent and address health problems, disaster and other health emergencies using its own resources (MOH, 2010). In this notion, the head of household, who is presumably male in this patriarchal community, has an important responsibility. He should encourage his family to practise healthy lifestyle behaviour including in maternal health matters such as preparing finance for delivery, transport in case of complications and taking wives to health professionals during pregnancy, childbirth and postpartum (MOH, 2010). To date, *Suami SIAGA* remains among the key indicators in the gender mainstreaming program led by the Ministry of Women Empowerment and Child Protection (MOWE, 2009).

### Maternal health situation in Indonesia

Strong political support and extensive efforts with regard to maternal health initiatives have yielded a remarkable increase in the proportion of delivery assisted by skilled health providers in Indonesia, up from 46% in 1995 to 81% in 2011, and the proportion of married women aged from 15 to 49 who used contraception rose from 47% in 1991 to 60% in 2011 (Bappenas, 2012). The MOH also reported that, by 2013, approximately 95% of expectant mothers made at least one ANC contact, while 83% of them had four or more (Balitbangkes-MoH, 2013). However, these overall figures mask large variations among different regions, with the proportion of institutional deliveries remaining low, at only 55% in 2011 (Bappenas, 2012).

The maternal mortality is believed to be persistently high, although the estimated rates are debatable due to the various measurement methods (Balitbangkes-MoH and UNFPA, 2012). Unlike the report by the World Health Organization (2015b), the 2012 Indonesia Demographic and Health Survey (IDHS) presented a surprising reversal in maternal mortality, with an increase estimated to 313 deaths in 2012, (95% CI: 222-404), compared to 209 deaths per 100 000 births in 2007 (95% CI: 137-281) (Ahmed *et al.*, 2014). Some possible contributing factors to this high maternal mortality rate are a lack of access to maternal health care services, information deficiency and poor quality of care, including a shortage of skilled birth attendants (Statistics Indonesia (Badan Pusat Statistik—BPS) *et al.*, 2013). A study in three districts of Indonesia by Supratikto *et al.* (2002) found that the maternal deaths were attributed to the substandard quality of care in health service institutions and delays in decision-making by 60 and 77%, respectively.

Although there are mixed findings regarding the effectiveness of ANC to reduce maternal deaths (Pandit, 1992; McDonagh, 1996; Carroli *et al.*, 2001), good quality ANC is considered to give some advantages for mothers and their families. It includes a proper health education and other supports which may avoid delays in decision-making during the critical event (World Health Organization, 2005). The MOH recommends skilled birth attendants to provide the essential ANC package, including physical examination, tetanus toxoid immunisation, provision of iron and folic acid supplements, as well as identification and treatment of infectious diseases (MOH, 2014). During the ANC visit, husbands are strongly recommended to attend at least once, so that skilled birth attendants can counsel both pregnant women and their partners about maternal and child health issues and plan delivery in a health facility (MOH, 2014). Accordingly, although *Suami SIAGA* may have no direct effect on maternal outcomes, it may affect the increased use of ANC and the institutional delivery. However, to date, there have been few studies assessing the effects of *Suami*

*SIAGA* on the utilisation of maternal health services. This paper explores male (husband/partner) engagement in Indonesia's safe motherhood program with an expectation to support the evidence-based policy on family and community empowerment especially in improving the use of ANC and delivery in a health facility.

### Study objectives

This study aims to identify the proportion of men who took part in *Suami SIAGA* from the perspective of husbands, as well as the factors associated with their participation, and to examine the relationship between *Suami SIAGA* and the presence of husbands during ANC visits, as well as the delivery in a health facility.

### Methods

#### Study population

This study used secondary data taken from the 2012 IDHS, a nationwide household-based survey, focusing on men and women of reproductive age. The survey interviewed 45 607 married and unmarried women aged 15–49 (with a 96% response rate) and 9306 married men aged 15–54 (with a 92% response rate). The 2012 IDHS questionnaire contained questions about the respondent's characteristics, reproductive and contraceptive history, care during pregnancy and after birth, immunisation, health and nutrition, fertility options, marital status and sexual activity, spousal background and female employment, HIV/AIDS and other various issues in health.

To explore the male partner's involvement in family health care, the respondents from the married men group were given questions about their knowledge, attitude, and practices concerning health care for their spouses and children [Statistics Indonesia (Badan Pusat Statistik *et al.*, 2013)]. Five questions related to aspects of *Suami SIAGA* were asked: whether during their wives' last pregnancy the men discussed with anyone about planning the birthplace, transportation to the birthplace, the birth attendant, payment of delivery costs and identifying potential blood donors. For the purpose of this study, we included an eligible sample of 1256 married men from the matched couples' dataset who had at least one childbirth within the 2 years preceding the survey. This period was chosen as it corresponds to the Ministry of Health's (MOH) recommendation of spacing at least two years between each birth (MoH, 2009a).

#### Study variables

Using the questionnaire data we examined a number of variables that may affect the husband's behaviour with regard to being a *Suami SIAGA*, including husband factors (age, place of residence, education, wealth index), wife factors (age, education), women empowerment factors (involvement of women in decision-making about their own health care), child-wish factors (whether husbands wish to have another child within two years or after more than two years, or if husbands are undecided or do not want another child) and parity, which was defined as number of children ever born (one live birth, two live births and three or more live births). In this present study, the women empowerment factor is based on women's response over a question of health care, whether decisions are made by the women themselves, jointly with husbands, or by their husbands alone. The key program variables which represented the alertness of husbands concerning birth preparedness were classified as *SIAGA* versus *Non-SIAGA*. *SIAGA* represents husbands who have discussed at least one out of five *Suami SIAGA* elements with

someone, while *Non-SIAGA* represents husbands who did not discuss any of the elements.

The increased presence of husbands during a prenatal checkup and facility delivery were the ultimate aims of the national campaign. In the 2012 IDHS, the husbands were asked whether they accompanied their wives during their ANC check-ups for their youngest child and whether their wives gave birth in a hospital or other health facilities.

### Analytical approach

We conducted bivariate and multiple logistic regression analyses to identify the factors associated with greater husband participation. Bivariate analyses were performed to determine the associations between variables of the husband factors, wife factors, women empowerment factor, child-wish factor, parity and the *Suami SIAGA* variable, as well as the association between the dependent variable of *Suami SIAGA* and the presence of husbands at ANC and the birth in a hospital or other health facilities. Multiple logistic regression was applied to analyse the relationships between the four sets of factors (husband, wife, women empowerment, and child-wish factors) as well as parity and the *Suami SIAGA* variable. This study then investigated whether the *Suami SIAGA* variable was independently associated with the husbands' attendance at ANC or delivery in a health facility, also by using multiple logistic regression. The results are shown in estimated odds ratios with a 95% confidence interval. The data analyses were conducted using SPSS version 17.0 (SPSS, Inc., Chicago, IL).

### Ethical statement

The 2012 IDHS project obtained an ethical clearance from the National Institute for Health Research and Development (Balitbangkes), Ministry of Health of Indonesia. Written informed consents were obtained by the IDHS project from all the survey participants before they agreed to participate (DHS, 2013). The author also sought and received permission from ICF International through the DHS program to analyse the data.

### Results

Of the 1,256 married men included in this study, and based on the respondents' answers to the questions on the five *Suami SIAGA* elements, 1,086 (86%) men were categorised as *SIAGA* husbands, and, 14% ( $n=170$ ) were *Non-SIAGA* husbands. Among husbands within the *SIAGA* group, the most frequent topics discussed were the place of delivery (75%) and delivery assistant (74%), followed by payment for delivery services (69%). Over half of the husbands (52%) talked about the means of transport to reach the birthplace, and only 22% discussed identification of potential blood donors.

Table 1 shows the characteristics of the respondents based on the selected background variables, divided between the *SIAGA* and *Non-SIAGA* groups. With regards to the husband factors, a higher proportion of *Non-SIAGA* husbands was found in the group of respondents aged 41-54 years old (19%), residing in rural areas (55%), and having a primary level of education (31%). With regards to the respondents' wealth, there were also more of the poorest and poorer husbands in the *Non-SIAGA* group, at 22% and 25%, respectively, than in the *SIAGA* group. Likewise, with regards to the wife factors, the proportion of *Non-SIAGA* husbands whose wives were aged 41-49 years old was higher (8%) than seen in the *SIAGA* group. More *Non-SIAGA* husbands had wives with only a primary level of education (38%),

while more *SIAGA* husbands had wives with secondary level of education or higher. In contrast to the *SIAGA* group, more wives with *Non-SIAGA* husbands (35%) made decisions on health care matters by themselves, without involving their husbands. Further, compared to the *SIAGA* group, more *Non-SIAGA* husbands reported that they did not wish to have another child (32%). In this bivariate analysis, all variables related to the husband and wife factors had significant relationships with the husband's *Suami SIAGA* related behaviours. However, our study observed no significant associations between any of the women empowerment variables, child-wish factor, parity and the *Suami SIAGA*.

Further statistical tests were carried out, with the results in Table 2 showing that only the wife factors had a significant association with the probability of husbands becoming *Suami SIAGA*. For older women, the probability of having *SIAGA* husbands was more than two times higher than younger women. The likelihood of women to have *SIAGA* husbands increased with the rise in the level of education, by 1.8 times in women with a secondary level of education and 2.7 times in women with a higher level of education.

Table 3 shows that the majority of husbands in the *SIAGA* Group (92%) would accompany their wives to visit a health provider for ANC. Likewise, more *SIAGA* husbands (73%) brought their wives to receive a professional assistance at delivery in a hospital or health facility compared to *Non-SIAGA* husbands (65%). The statistical test yielded the results that *Suami SIAGA* has significant associations with both the husband's attendance at ANC and the facility delivery.

Using the multiple logistic regression, the relationship between *Suami SIAGA* and husbands' presence at ANC and the facility delivery were further tested by controlling other variables. Table 4 shows that men in the *SIAGA* group were more likely to be present during wives' ANC (OR = 2.3; 95% CI: 1.4-3.7). *SIAGA* husbands also tend to take their spouses to give birth at a health facility, although this result was not significant (OR = 1.1; 95% CI: 0.8-1.6). Living in urban areas has a higher probability to deliver at a health facility by 2.7 times than in rural areas. The wealth index was associated with both husband's ANC accompaniment and women giving birth in a hospital or health facilities. Wives with a secondary and higher level of education had significant associations with giving birth at a health facility. However, undecided about the child wish and parity were negatively associated with both husband's presence at ANC and wife's delivery in health facility.

### Discussion

The findings of this study show that most of the men in the study population (86%) acquired at least one of the *Suami SIAGA* attributes, as they had carried out discussions with someone in relation to birth preparedness. Husband's knowledge about *Suami SIAGA* significantly associates with planning the delivery in a health facility (Anggraini, 2012). Husbands are more open to discuss maternal health issues and proud to get involved with their wives in preparing for the birth of their children. A qualitative study in Malawi about strategies to promote husbands' participation in maternal health program, as voiced by the local health personnel, reported husbands' positive behaviour changes in health care, an increasing number of deliveries at hospital, and a decreasing number of maternal deaths (Kululanga et al., 2011). A study reflecting Indonesian Muslims' perspective revealed that, although husbands' involvement is still generally limited, they actually can accept responsibility in maternal health affairs and are aware of the importance of accompanying wives for the prenatal check-up (Ilyas et al., 2006). Wives

**Table 1.** Details of the respondents with regard to *Suami SIAGA*

Variables	Non-SIAGA	SIAGA		X <sup>2</sup>
Husband factors	<i>n</i> (%)	<i>n</i> (%)	<i>n</i>	
Age				
15–29 ( $\bar{x}$ = 25.9)	52 (31)	348 (32)	400	6.47*
30–40 ( $\bar{x}$ = 34.3)	85 (50)	604 (56)	689	
41–54 ( $\bar{x}$ = 44.4)	33 (19)	134 (12)	167	
Place of residence				
Urban	77 (45)	620 (57)	697	8.28*
Rural	93 (55)	466 (43)	559	
Education				
<Primary	53 (31)	207 (19)	260	17.37***
Secondary	96 (56)	638 (59)	734	
Higher	21 (12)	241 (22)	262	
Wealth index				
Poorest	37 (22)	175 (16)	212	10.81*
Poorer	42 (25)	200 (18)	242	
Middle	34 (20)	221 (20)	255	
Richer	31 (18)	240 (22)	271	
Richest	26 (15)	250 (23)	276	
Wife factors				
Age				
15–29 ( $\bar{x}$ = 24.5)	99 (58)	619 (57)	718	11.03*
30–40 ( $\bar{x}$ = 33.9)	58 (34)	436 (40)	494	
41–49 ( $\bar{x}$ = 42.5)	13 (8)	31 (3)	44	
Education				
<Primary	65 (38)	218 (20)	283	31.72***
Secondary	87 (51)	633 (58)	720	
Higher	18 (11)	235 (22)	253	
Women empowerment factor (Who makes decisions on the wife's health care)				
Wife alone	60 (35)	341 (31)	401	1.72
Husband and wife	81 (48)	576 (53)	657	
Husband alone	29 (17)	169 (16)	198	
Child-wish factor				
Want in 2 years	7 (4)	66 (6)	73	1.87
Want after more than 2 years	88 (52)	589 (54)	677	
Undecided	20 (12)	118 (11)	138	
Want no more children	55 (32)	313 (29)	368	
Parity				
1	64 (38)	453 (42)	517	1.26
2	55 (32)	345 (32)	400	
3+	51 (30)	288 (26)	339	
Total	170 (100)	1086 (100)	1256 (100%)	

\* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$ .

whose husbands join their ANC are more likely to use skilled birth attendants (Mangeni *et al.*, 2012, Chattopadhyay, 2012).

In the current study, the wife's factors (age and education) show a significant association with the possibility of their husbands becoming *Suami SIAGA*. The probability of women having a *SIAGA* husband is greater as they get older. This confirms the results of a review study by Ditekemena *et al.* (2012), which found that women with older age were associated with greater men involvement in maternal and child health services. According to Chakraborty *et al.* (2003), women's age may represent their cumulative knowledge on health issues and thus may influence their decisions about what actions to take during pregnancy. Since older women presumably have better knowledge about maternal health issues, they also may become more cautious about the risks related to pregnancy, and so be able to convince their husbands to be more attentive. On the other hand, older husbands would show more empathy to their wife for the burden during pregnancy and want to support (Ilyas *et al.*, 2006).

Consistent with the finding from a study in Nepal (Thapa and Niehof, 2013), this present study show a strong association between education level of women and participation of husbands in maternal care. Among various socioeconomic factors, women's education was consistently found to have a significant association with the maternal health care utilization in many previous studies (Ahmed *et al.*, 2010; Rai *et al.*, 2012; Moyer and Mustafa, 2013; Achia and Mageto, 2015). This is similar to our results that the increased level of women's education increases the probability of *Suami SIAGA* as well as the use of institutional delivery. Formal education plays a vital role in empowering women and enhancing their autonomy, as educated women understand their rights and are more confident in making decisions and choices for their own health (Achia and Mageto, 2015).

Our results show that *SIAGA* husbands have significant associations with husband's attendance at ANC and the institutional delivery, although the latter become insignificant after adjusting variables in the regression model. In the same vein, Yargawa and

**Table 2.** Multiple logistic regression of the husband factors, wife factors, women empowerment factors, child-wish factors and SIAGA variables

Variables	SIAGA OR (95% CI)
<b>Husband factors</b>	
Age	
15–29	1
30–40	1.5 (0.8–3.1)
41–54	1.4 (0.8–2.4)
Place of residence	
Rural	1
Urban	1.2 (0.8–1.8)
Education	
<Primary	1
Secondary	1.2 (0.8–1.8)
Higher	1.5 (0.7–2.9)
Wealth index	
Poorest	1
Poorer	0.8 (0.5–1.3)
Middle	1.0 (0.6–1.7)
Richer	1.0 (0.5–1.7)
Richest	1.0 (0.5–1.9)
<b>Wife factors</b>	
Age	
15–29 ( $\bar{x}$ = 24.5)	1
30–40 ( $\bar{x}$ = 33.9)	2.0 (0.8–4.9)
41–49 ( $\bar{x}$ = 42.5)	2.4 (1.1–5.5)*
Education	
<Primary	1
Secondary	1.8 (1.2–2.7)**
Higher	2.8 (1.4–5.6)**
Women empowerment factor (Who makes decisions on the wife's health care)	
Wife alone	1
Husband and wife	1.2 (0.8–1.8)
Husband alone	1.1 (0.7–1.8)
Child-wish factors	
Want in 2 years	1
Want after more than 2 years	1.3 (0.5–3.2)
Undecided	1.0 (0.6–1.6)
Want no more children	1.0 (0.6–1.9)
Parity	
1	1
2	0.9 (0.6–1.5)
3+	1.1 (0.6–2.0)

\* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $p < 0.001$ .

Leonardi-Bee (2015) reported a significant association between male participation and the increased use of maternal health care, especially with regard to the delivery by skilled attendants and postpartum services. Yet, higher potential maternal benefits may be achieved from involving men during pregnancy and postpartum than delivery (Yargawa and Leonardi-Bee, 2015). Continuous efforts are needed to increase men's awareness about maternal health issues.

In this study, place of residence is associated with delivery in health facilities. Those who live in urban areas have a greater chance of giving birth in health facilities compared to rural residents. This may be linked to inequity in the accessibility and infrastructure availability over the country. Balitbangkes-MoH and UNFPA (2012) indicated that rural areas have more difficult access to health facilities than urban areas, which contributed to the higher maternal deaths occurring at home among rural dwellers. In addition, two

consecutive IDHS reports in 2012 and 2007 have shown a higher percentage of urban women giving birth in health facilities, 80% and 70%, respectively (Statistics Indonesia (Badan Pusat Statistik *et al.*, 2013, Statistics Indonesia - Badan Pusat Statistik - BPS and Macro International, 2008). Providing easier access to birth facilities for rural inhabitants should become a priority agenda in SDGs.

The results of the present study show that the wealth index variables associates with the husband's involvement in ANC and wife's delivery in a health facility. Increasing husband's wealth enhance the chance of husbands getting more involved in ANC contact and choosing health facilities for the delivery. Similarly, a strong association between husband's wealth and the use of ANC was reported by a study in India (Chattopadhyay, 2012). A study conducted by Wai *et al.* (2015) in Myanmar noted that husbands were the primary financial supporters of ANC despite insignificant association. Literature has shown the evidence supporting the relationship between income level and birth at a health facility: women from a high economic status family are more likely to give birth in health facilities (Chattopadhyay, 2012; Moyer and Mustafa, 2013; Yesuf *et al.*, 2014). With current government policies encouraging male involvement and acknowledging the socio-economic factors, it is important to target the poorest and most vulnerable families under a conditional program. New ideas and approaches within national policy guidelines should be considered in fostering the involvement of male partners among poor families.

Undecided about the child wish indicates a negative association with husband involvement in ANC and birth at health facilities in this study. In comparison to husbands who desire to have or not to have another child, those with the undecided option are less likely to get involved in ANC and utilise institutional delivery. Linking this finding by strengthening the family planning intervention in men's roles within a family may have a positive impact on women's health.

This study reveals that parity has a negative association with husband's presence at ANC and birth at health facilities. Higher parity decreases the odds of ANC accompaniment and delivery at a health facility, which is similar to the finding of other studies (Chattopadhyay, 2012; Tey and Lai, 2013; Wai *et al.*, 2015). Women's previous experience with uncomplicated pregnancy and their heavy responsibility to look after other children might affect the perception and the willingness to use maternity services (Joshi *et al.*, 2014). This finding supports the evidence of the beneficial effect of male involvement in maternal and healthcare utilisation. Involving male is a potential gender-transformative that can contribute to the improvement of maternal health outcomes (Comrie-Thomson *et al.*, 2015). Therefore, this study highlights a call to engage husbands under the continuum of care dimension.

Due to the strong relation between women's factors and *Suami SIAGA*, it is important to focus maternal health education efforts on both men and women as couples. In our study, husbands who had discussions on birth preparedness with someone, probably the closest family including wives, were more likely to make joint visits to the ANC. This finding is consistent with previous research which reported that husbands and wives who had discussions on health tended to be more open to the idea of receiving antenatal and delivery care (Furuta and Salway, 2006; Mullany *et al.*, 2007). Improving how couples communicate in relation to maternal health issues may improve health care seeking behaviour related to pregnancy, childbirth and the postpartum period (Mullany *et al.*, 2007). Therefore, the *Suami SIAGA* campaign should be repackaged and widely disseminated, aiming at couples. Further, improving methods for identifying and targeting the uneducated and youngest women to receive MNH services at village level may be beneficial in leveraging

**Table 3.** Bivariate relationship between the variables of *Suami SIAGA* and the presence of husbands during ANC visits and the place of delivery

Variables	Present n (%)	Not Present n (%)	X <sup>2</sup>	Hospital, health facility n (%)	Not Hospital, health facility n (%)	X <sup>2</sup>
Non-SIAGA	138 (81)	32 (19)	23.18***	110 (65)	60 (35)	4.91*
SIAGA	1005 (92)	81 (8)		792 (73)	294 (27)	

\* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$ .

**Table 4.** Multiple logistic regression of the presence of the husband at ANC and delivery at a hospital or health facility, by controlling other variables

Variables	Husbands present OR (95% CI)	Birth at health facilities OR (95% CI)
<i>Suami SIAGA</i>		
Non-SIAGA	1	1
SIAGA	2.3 (1.4–3.7)***	1.1 (0.8–1.6)
Husband factors		
Age		
15–29	1	1
30–40	1.5 (0.7–3.5)	0.9 (0.5–1.6)
41–54	1.2 (0.6–2.3)	1.1 (0.7–1.7)
Place of residence		
Rural	1	1
Urban	1.3 (0.8–2.1)	2.7 (2.0–3.7)***
Education		
<Primary	1	1
Secondary	1.1 (0.7–1.8)	1.0 (0.7–1.5)
Higher	1.0 (0.4–2.4)	0.7 (0.4–1.2)
Wealth index		
Poorest	1	1
Poorer	1.8 (1.0–3.3)*	2.0 (1.4–3.0)***
Middle	1.9 (1.0–3.6)*	2.6 (1.7–4.1)***
Richer	2.5 (1.2–5.2)*	3.9 (2.4–6.3)***
Richest	2.3 (1.0–5.1)*	4.6 (2.7–8.0)***
Wife factors		
Age		
15–29 ( $\bar{x} = 24.5$ )	1	1
30–40 ( $\bar{x} = 33.9$ )	0.9 (0.3–3.0)	0.5 (0.2–1.4)
41–49 ( $\bar{x} = 42.5$ )	1.1 (0.4–3.2)	0.7 (0.3–1.8)
Education		
<Primary	1	1
Secondary	1.3 (0.8–2.1)	1.4 (1.0–2.0)*
Higher	2.4 (0.9–6.1)	2.6 (1.4–4.6)***
Women empowerment factor (Who makes decisions on the wife's health care)		
Wife alone	1	1
Husband and wife	1.0 (0.6–1.8)	0.8 (0.6–1.3)
Husband alone	1.6 (0.9–2.8)	0.8 (0.6–1.3)
Child-wish factors		
Want in 2 years	1	1
Want after more than 2 years	0.6 (0.2–1.5)	0.9 (0.4–1.8)
Undecided	0.5 (0.3–0.9)*	0.5 (0.3–0.8)***
Want no more children	1.0 (0.5–2.0)	0.8 (0.5–1.3)
Parity		
1	1	1
2	0.4 (0.2–0.7)*	0.6 (0.4–0.9)*
3+	0.3 (0.2–0.6)**	0.3 (0.2–0.5)***

\* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$ .

the program. This intervention could work to support the Birth Preparedness/Complication Readiness (BP/CR) strategy, an effort to improve maternal and child health within the Health Development Agenda 2015–2019 (Bappenas *et al.*, 2014, MoH, 2013). This approach would also be in line with the current re-promotion of the MFM (MoH, 2013), with increasing support of *Suami SIAGA* being one of the key indicators of success in this context (MOWE, 2012).

This study reports significant results of the relationship between *Suami SIAGA* and the maternal health care utilisation (represented by the husband's presence at ANC and delivery at a hospital or health facility). However, expanding coverage of the utilisation alone without focusing on the quality improvement of maternity care has a potential failure in achieving good maternal outcomes. Reducing maternal mortality requires universal maternal service coverage along with the high quality of continuum care supported by a well-established infrastructure, good clinical and non-clinical practices, and competence health worker (World Health Organization, 2016). Therefore, *Suami SIAGA* program should be revitalised with a caution by addressing more quality issues in maternity care.

Limitations are inevitable in our study. First, we used secondary data, so the variables studied were restricted only those collected in the IDHS. Second, due to the cross-sectional nature of the survey, it was impossible to infer causal relationship.

## Conclusion

Participation of male partners is crucial in improving the utilization of maternal health services. The *Suami SIAGA* program, as part of the Mother Friendly Movement, should, therefore, continue to be promoted to motivate husbands in becoming more supportive during their wives' pregnancy, childbirth and postpartum period. Moreover, efforts at educating husbands and wives in birth preparedness should be specifically designed to target certain populations, such as younger and less well-educated couples. While the *Suami SIAGA* campaign could be widely disseminated through various media, health workers, especially midwives, who work closely with the community should also actively promote the campaign message. Midwives with support from the Village Consultative Body and health cadres, should advocate men to support their pregnant wives throughout pregnancy, childbirth and postpartum. Further research is needed to examine the involvement of husbands in relation to other maternal health issues in Indonesia, such as the use of postpartum family planning and any impact on respect and abuse during pregnancy. Further study on the cost-effectiveness of this program should also be considered.

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## References

- Abdullah C, Iskandar M, Sciortino R. 1998. The Life Saver: The Mother Friendly Movement in Indonesia, Jakarta, Galang Communication, The State Ministry for the Role of Women, The Ford Foundation.
- Achia TNO, Mageto LE. 2015. Individual and contextual determinants of adequate maternal health care services in Kenya. *Women & Health* 55: 203–26.
- Ahmed S, Creanga AA, Gillespie DG, Tsui AO. 2010. Economic status, education and empowerment: implications for maternal health service utilization in developing countries. *PLoS One* 5: e11190.
- Ahmed S, Qingfeng L, Scrafford C, Pullum TW. 2014. *An assessment of DHS maternal mortality data and estimates: DHS Methodological Report 13*, Rockville, ICF International.
- Anggraini NF. 2012. *Hubungan Pengetahuan tentang Suami Siaga dengan Perencanaan Persalinan (The Relationship Between Knowledge of Suami Siaga and the Planning of Delivery)*. UNIVERSITAS AIRLANGGA.
- Balitbangkes-Moh. 2013. *Riset Kesehatan Dasar Tahun 2013 [The 2013 Basic Health Research]*. Jakarta: Balitbangkes MoH.
- Balitbangkes-Moh and UNFPA 2012. *Disparitas, Akses dan Kualitas. Kajian Determinan Kematian Maternal di Lima Region Indonesia (Disparity, Access and Quality. A study on Maternal Death Determinants in Five Regions of Indonesia)*. Jakarta: Kemenkes RI and UN Population Fund.
- Bappenas. 2012. *Report on Achievement of the Millennium Development Goals Indonesia 2011*. Jakarta: Ministry of National Development Planning.
- Bappenas, Kemenkes, BPOM, BKKBN & BPJS-Kesehatan. 2014. *Health Sector Review: Policy briefs* [Online]. Jakarta: AIPHSS. Available: [http://aiphss.org/wp-content/uploads/2014/12/Kumpulan-Policy-Brief-English\\_Bagian-I-23Nov2014.pdf](http://aiphss.org/wp-content/uploads/2014/12/Kumpulan-Policy-Brief-English_Bagian-I-23Nov2014.pdf), accessed 15 June 2015.
- Carrolli G, Villar J, Piaggio G, Khan-Neelofur D, Gülmezoglu M, Mugford M, Lumbiganon P, Farnot U, Bersgjo P. 2001. WHO systematic review of randomised controlled trials of routine antenatal care. *The Lancet* 357: 1565–1570.
- Chakraborty N, Islam MA, Chowdhury RI, Bari W, Akhter HH. 2003. Determinants of the use of maternal health services in rural Bangladesh. *Health Promotion International* 18: 327–37.
- Chattopadhyay A. 2012. Men in maternal care: evidence from India. *Journal of Biosocial Science* 44: 129–53.
- Comrie-Thomson L, Tokhi M, Ampt F *et al.* 2015. Challenging gender inequity through male involvement in maternal and newborn health: critical assessment of an emerging evidence base. *Culture, Health & Sexuality* 17: 177–89.
- Davis J, Luchters S, Holmes W. 2013. *Men and maternal and newborn health: Benefits, harms, challenges and potential strategies for engaging men*. Melbourne, Australia: Center for International Health, Burnet Institute.
- DHS. 2013. *Demographic and Health Surveys* [Online]. Calverton: ICF International.
- Ditekemena J, Koole O, Engmann C *et al.* 2012. Determinants of male involvement in maternal and child health services in sub-Saharan Africa: a review. *Reproductive Health* 9: 32.
- FURUTA M, SALWAY S. 2006. Women's position within the household as a determinant of maternal health care use in Nepal. *International Family Planning Perspectives* 32: 17–27.
- Hill PS, Goeman L, Sofiarini R, Djara MM. 2014. 'Desa SIAGA', the 'Alert Village': the evolution of an iconic brand in Indonesian public health strategies. *Health Policy and Planning* 29: 409–20.
- Hunt P, De Mesquita JB. 2007. *Reducing Maternal Mortality: The contribution of the right to the highest attainable standard of health*, Essex, University of Essex-UNFPA-European Union.
- Ilyas H, Aryani SA, Hidayat R. 2006. *Men's Involvement in Reproductive Health: An Islamic Perspective*, Center for Women's Studies, State Islamic University Sunan Kalijaga.
- JHUCCP 2004. *Mobilizing for Impact: Indonesia's SIAGA Campaign Promotes Shared Responsibility*, Baltimore, JHPIEGO.
- Joshi C, Torvaldsen S, Hodgson R, Hayen A. 2014. Factors associated with the use and quality of antenatal care in Nepal: a population-based study using the demographic and health survey data. *BMC Pregnancy Childbirth* 14: 94.
- Kululunga LI, Sundby J, Chirwa E. 2011. Striving to promote male involvement in maternal health care in rural and urban settings in Malawi—a qualitative study. *Reproductive Health* 8: 36.
- Mangeni JN, Mwangi A, Mbugua S, Mukthar VK. 2012. Male involvement in maternal healthcare as a determinant of utilisation of skilled birth attendants in Kenya. *East Africa Medical Journal* 89: 372–83.
- Mcdonagh M. 1996. Is antenatal care effective in reducing maternal morbidity and mortality? *Health Policy and Planning* 11: 1–15.
- MOH. 2009a. *Pedoman pemantauan wilayah setempat kesehatan ibu dan anak (PWS-KIA) [Guideline of Local Area Monitoring of Mother and Child Health-PWS KIA]*, Jakarta, Kementerian Kesehatan.
- MOH. 2009b. *Program Perencanaan Persalinan dan Pencegahan Komplikasi (Birth Preparedness and Complication Readiness)*, Jakarta, Kementerian Kesehatan.
- MOH. 2010. *Pedoman Umum Pengembangan Desa Dan Kelurahan Siaga Aktif (Guidelines for the Development of Active Alert Villages)*. Jakarta: Pusat Promosi Kesehatan Kementerian Kesehatan.
- MOH. 2013. *Rencana Aksi Percepatan Penurunan Angka Kematian Ibu di Indonesia (Plan of Action on Accelerating Reduction of Maternal Mortality in Indonesia)*. Jakarta: Ministry of Health of Republic of Indonesia.
- MOH. 2014. *Peraturan Menteri Kesehatan Republik Indonesia Nomor 97 Tahun 2014 Tentang Pelayanan Kesehatan Masa Sebelum Hamil, Masa Hamil, Persalinan, Dan Masa Sesudah Melahirkan, Penyelenggaraan Pelayanan Kontrasepsi, Serta Pelayanan Kesehatan Seksual (Health Minister Regulation Number 97 Year 2014 Concerning Health Services During Pre-pregnancy, Pregnancy, Childbirth, and Postnatal Periods, Contraception Service and Reproductive Health)*. Jakarta: Kementerian Kesehatan RI.
- MOWE. 2009. *Peraturan Menteri Negara Pemberdayaan Perempuan Republik Indonesia Republik Indonesia Nomor 06 Tahun 2009 Tentang Penyelenggaraan Data Gender Dan Anak (Ministerial Decree Number 06 year 2009 concerning Data Management of Gender and Children)*. Jakarta Ministry of Women Empowerment of Indonesia.
- MOWE. 2012. *Panduan Penilaian Kecamatan Sayang Ibu Pada Pelaksanaan Revitalisasi Gerakan Sayang Ibu (Guideline for the Mother Friendly Sub District Competition On the Revitalization of Mother Friendly Movement)* Jakarta: Kementerian Negara Pemberdayaan Perempuan RI (Ministry of Women Empowerment of Indonesia).
- MOWE, JHUCCP & UNFPA 2003. *Key Findings: Suami Siaga Campaign Impact Evaluation*. Baltimore: Johns Hopkins University/Center for Communication Programs.
- Moyer CA, Mustafa A. 2013. Drivers and deterrents of facility delivery in sub-Saharan Africa: a systematic review. *Reproductive Health* 10: 40.
- Mullany BC, Becker S, Hindin M. 2007. The impact of including husbands in antenatal health education services on maternal health practices in urban Nepal: results from a randomized controlled trial. *Health Education Research* 22: 166–76.
- PANDIT RD. 1992. Role of antenatal care in reducing maternal mortality. *Asia-Oceania Journal of Obstetrics and Gynaecology* 18: 1–6.
- Rai RK, Singh PK, Singh L. 2012. Utilization of maternal health care services among married adolescent women: Insights from the Nigeria demographic and health survey, 2008. *Women's Health Issues* 22: e407–14.
- Shefner-Rogers CL, Sood S. 2004. Involving Husbands in Safe Motherhood: Effects of the SUAMI SIAGA Campaign in Indonesia. *Journal of Health Communication* 9: 233–58.
- Shiffman J. 2003. Generating political will for safe motherhood in Indonesia. *Social Science & Medicine* 56: 1197–207.
- Statistics Indonesia - (BADAN PUSAT STATISTIK - BPS) & Macro International. 2008. *Indonesia Demographic and Health Survey 2007*. Calverton, Maryland, USA: BPS and Macro International.
- Statistics Indonesia (BADAN PUSAT STATISTIK—BPS), National Population and Family Planning Board (BKKBN), Kementerian Kesehatan (KEMENKES-MOH) & ICF International 2013. *Indonesia Demographic and Health Survey 2012*. Jakarta, Indonesia: BPS, BKKBN, Kemenkes, and ICF International.
- Supratikto G, Wirth ME, Achadi E, Cohen S, Ronsmans C. 2002. A district-based audit of the causes and circumstances of maternal deaths in South Kalimantan, Indonesia. *Bulletin of the World Health Organization* 80: 228–34.



- Tey N-P, Lai S-L. 2013. Correlates of and barriers to the utilization of health services for delivery in South Asia and Sub-Saharan Africa. *The Scientific World Journal* 2013:
- THAPA DK, NIEHOF A. 2013. Women's autonomy and husbands' involvement in maternal health care in Nepal. *Social Science & Medicine* 93: 1–10.
- UNITED NATIONS 2015. *The Millennium Development Goals Report 2015*. New York: United Nations.
- Wai KM, Shibanuma A, Oo NN *et al.* 2015. Are Husbands Involving in Their Spouses' Utilization of Maternal Care Services?: A Cross-Sectional Study in Yangon, Myanmar. *PLoS ONE* 10: e0144135.
- World Health Organization. 2005. *The World Health Report 2005: Make Every Mother and Child Count*. Geneva: World Health Organization.
- World Health Organization. 2006. *Making a difference in countries: Strategic approach to improving maternal and newborn survival and health*, Geneva, World Health Organization.
- World Health Organization. 2010. *Working with individuals, families and communities to improve maternal and newborn health*, Geneva, World Health Organization.
- World Health Organization. 2015a. *Health in 2015: from MDGs, Millennium Development Goals to SDGs, Sustainable Development Goals*, Geneva: World Health Organization.
- World Health Organization. 2015b. Trends in maternal mortality: 1990 to 2015: Estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. Geneva: World Health Organization.
- World Health Organization. 2016. *Standards for improving quality of maternal and newborn care in health facilities* [Online]. Geneva: World Health Organization. Available: <http://apps.who.int/iris/bitstream/10665/249155/1/9789241511216-eng.pdf?ua=1> [Accessed 26 October 2016].
- Yargawa J, Leonardi-Bee J. 2015. Male involvement and maternal health outcomes: systematic review and meta-analysis. *Journal of Epidemiology and Community Health* 69, 604.
- Yesuf EA, Kerie MW, Calderon-Margalit R. 2014. Birth in a Health Facility – Inequalities among the Ethiopian Women: Results from Repeated National Surveys. *PLoS ONE* 9: e95439.