

ANU COLLEGE OF ARTS & SOCIAL SCIENCE



Determinants of Unintended Pregnancy among Ever-Married Women in Indonesia: An Analysis of the 2007 IDHS

Nur Jaeni
Prof. Peter McDonald
Dr. Iwu Dwisetyani Utomo

ADSRI Working Paper
2009

Determinants of Unintended Pregnancy among Ever-Married Women in Indonesia: An Analysis of the 2007 IDHS

Nur Jaeni¹, Prof. Peter McDonald², Dr. Iwu Dwisetyani Utomo³

Australian Demographic and Social Research Institute, Australian National University

Abstract

Despite growths in contraceptive prevalence rate and declines in total fertility rate, many women in Indonesia still experience unintended pregnancies. It is essential to identify the determinants of unintended pregnancy to facilitate policy makers and programme managers to design programmes and services especially for women who have the highest likelihood of having unintended pregnancy. This study analysed factors that influenced ever married women in Indonesia to classify their pregnancy as mistimed or unwanted. This study used bivariate tables and multivariate logistic regression to investigate the relationship between women's pregnancy intention status and a number of socio-demographic variables (maternal age, previous birth intervals, number of previous births/parity, level of education, place and region of residence, ever used of contraception, husband's desire for family size, and economic status). Data for this study were obtained from the 2007 IDHS. Among women respondents of the 2007 IDHS, 15,127 had at least one birth during five years preceding the survey date. From these respondents, women whose pregnancies were mistimed or unwanted were identified. These women were asked the planning status of the most recent birth; whether the birth was mistimed, unwanted or was born according to plan. Of the 15,127 births, 19.9% were classified as unintended consisting of 11.9% mistimed and 8.0% unwanted. For mistimed childbearing, the most significant determinants are preceding birth interval, age of mother, educational attainment, and number of previous births or parity. For unwanted childbearing, the most significant determinants are number of previous births or parity, age of mother, preceding birth interval, and region of residence. Dealing with the issues of unintended childbearing is to target the interventions to its root causes: tackling the high prevalence of mistimed and unwanted childbearing among women with pregnancies which are closely spaced from the previous birth, women with high parity, women who disagree with their husband about their family size, poor women who can not obtain or access contraceptives, and older women who do not want any more children at all. Resolving the problems of unintended childbearing is to assure that women of reproductive age have access to family planning information and services, and to support to raise women's status so that they would recognize their rights and they can regulate their fertility and thus they can properly space their pregnancies or limit their family size. More information is needed about family planning methods and its appropriate use. The role of quality of care in increasing women's capability to attain their reproductive goal should be taken into consideration.

Keywords

Unintended pregnancy, Ever-married women, Indonesia, pregnancy intention, 2007 IDHS

¹Scholar, Australian Demographic and Social Research Institute, The Australian National University. Email: u4503532@anu.edu.au.

²Professor and Director, Australian Demographic and Social Research Institute, The Australian National University. Email: Peter.Mcdonald@anu.edu.au.

³Fellow, Australian Demographic and Social Research Institute, The Australian National University. Email: Iwu.Utomo@anu.edu.au.

INTRODUCTION

The term ‘unintended pregnancy’ or ‘unplanned pregnancy’ has been used to describe the sum of both mistimed and unwanted pregnancy (Tsui, Wasserheit, and Haaga 1997, Brown and Eisenberg 1995). Unintended pregnancy or unplanned pregnancy, thus, refers to the sum of mistimed and unwanted pregnancy. A woman is assumed to have a mistimed pregnancy, if the woman did not want to become pregnant at the time when she became pregnant because she wanted to become pregnant later. On the other hand, a woman is assumed to have an unwanted pregnancy if the women did not want to become pregnant at all, or in other words the pregnancy occurred when she wanted to have no more children (Adetunji 1997).

Unintended pregnancy, in recent times, emerged as a crucial public health issue in developing world because it has extensive adverse health, social and economic effects, not only upsetting for the affected mothers and children. Mothers who have mistimed pregnancy are less likely to initiate and utilise prenatal and antenatal care, or seek it later than mothers whose pregnancies are intended (Eggleston 1998, Joyce and Grossman 1990, Stable, Stockbaver, Schramm, and Lard 1990). Unplanned pregnancies can also have higher likelihood of low birth weight and unsafe abortion (Bitto, Gray, Simpson, Queenan, Kambic, Perez, Mena, Barbato, Li, and Jennings 1997, Eggleston 1997, Forrest 1994, Gage 1996, Tarn 1991, Kost, Landry, and Darroch 1998).

In Indonesia, experiencing an unintended pregnancy harmfully affects psychological well-being of women (Hardee, Eggleston, Wong, Irwanto, and Hull 2004). Women who had had an unintended pregnancy were more likely to have lower psychological well-being rather than having medium or higher psychological well-being. Jensen and Ahlburg (2002) also found that in Indonesia, children who are classified as unwanted at the time of birth are more likely to become sick and less likely to get treatment for sickness compared with those children who are classified as wanted at the time of birth. The rate of unintended pregnancy is also one of the most basic measures of the situation of women's reproductive health, and of the level of women's autonomy and capacity for self determination, because it signifies a woman's capacity to determine whether and when to have pregnancies.

This study is aimed to identify the determinants of unintended pregnancy in Indonesia, where fertility rate has fallen significantly during the past four decades. According to Hull and Mosley (2008), the total fertility rate in Indonesia declined markedly from 5.6 lifetime births per woman in 1971 to 2.2 in 2007. This reduction in fertility level has been attributed to the greater accessibility and use of effective family planning methods. Contraceptive prevalence

rate among currently married women of reproductive age increased from 26.0% in 1980 to 61.4% in 2007. However, despite growths in contraceptive prevalence rate and declines in total fertility rate, many women in Indonesia, where induced abortion is illegal, still experience unintended pregnancies.

While it is presumably that the rate of unintended pregnancy declined with the rise of effective contraceptives use, lately it has increased gradually in Indonesia. For instance, in the 2007 Indonesia Demographic and Health Survey (IDHS), around 19.7% of women said that their pregnancies in the five years preceding the interview date was unintended, consist of about 7.4% who reported their pregnancy as unwanted because they had wanted no more children at the time of the conception and around 12.3% who reported their pregnancy as mistimed because it happened earlier than expected (CBS 2008). Corresponding proportions in the 2002-2003 IDHS were about 16.8% unintended, consist of around 9.6% unwanted and about 7.2% mistimed, respectively (CBS 2004).

Unplanned pregnancies mostly arise as a result of misuse or nonuse of family planning methods, or a noticeable contraceptive failure (Adetunji 1997, Bongaarts 1997, Forrest 1994). Results from studies in several developing countries show that unintended pregnancies are strongly associated with maternal age and number of previous births (Adetunji 1997, Adikari, Soonthorndhada, and Prasartkul 2006, Eggleston 1999, Shaheen, Diaaeldin, Chaaya, and El Roueiheb 2007). Young women have higher likelihood of misuse or nonuse of effective family planning methods than older women and have greater risk to have mistimed than an intended pregnancy (Kost and Forrest 1995, Sulak and Haney 1993, Williams 1991). Urban women, furthermore, are less likely than rural women to have more children than that which they regard as ideal. Findings of the analyses from a number of countries also indicated that women with better education levels were less likely than those with less education levels to have more children than that which they regard as ideal (Adetunji 1997, Adikari, Soonthorndhada, and Prasartkul 2006, Eggleston 1999, Shaheen, Diaaeldin, Chaaya, and El Roueiheb 2007). Moreover, the higher education and the better socioeconomic status a woman had, than it is less likely for her to have an unplanned pregnancy.

One multinational study (Adetunji 1997), furthermore, revealed that unwanted pregnancy reduced with length of education, but that no considerable correlation appeared between unwanted pregnancy and socioeconomic status. In a study conducted in Chile, women aged less than 25 years old of low socioeconomic status were more likely than their peers living in households of better socioeconomic status to have unplanned pregnancies (Herold, Thompson, and Valenzuela 1994).

A slightly dissimilar set of factors is correlated to mistimed pregnancies rather than to unwanted pregnancies. The analyses in a number of developing countries mentioned before found that the proportions of mistimed pregnancies are higher among younger women, who probably want a child much later in their life. The multivariate analysis of DHS data for Peru and Colombia (1991 and 1995 respectively) revealed that the odds of mistimed pregnancies in these countries compared with both wanted and unwanted pregnancies, increased with a woman's length of education, but that there was no considerable association between mistimed pregnancy and socioeconomic status (Adetunji 1997).

By and large, the foremost factor influencing fertility and thus the odds of unplanned pregnancy is the use of contraceptive methods (Bongaarts 1997). It pursues that knowledge about contraception and access to contraception are key factors of effective contraceptive use. If a woman is uninformed that she can control her fertility or are not familiar with how to do so or is not able to get family planning services, she is basically does not have the ability to prevent mistimed and unwanted pregnancy. Though, knowledge of family planning methods and access to family planning services do not ensures contraceptives use or its efficacy (Brown and Eisenberg 1995).

It is essential to understand the determinants of unintended pregnancy to facilitate policy makers and programme managers to design programmes and services especially for the women who have the highest likelihood of having unintended pregnancy. This study analysed factors that influenced ever married women in Indonesia to classify their pregnancy as mistimed or unwanted. Understanding the determinants of unintended childbearing would lead to better interventions to avoid such childbearing, and improve the wellbeing of mothers and children (Santeli, Roger, Kendra, Brenda, Kathryn, Rebecca, Jennifer, and Laura 2003). Research on unintended childbearing supports public health professionals to plan and implement more efficient programmes with regard to maternal and child health.

This research, moreover, targets Indonesian women of different socio demographic background and with different reproductive health behaviour than those women in developed countries. In Indonesia, assessing unintended childbearing and its determinants offers research evidence for policy makers and programme planners to design better maternal and child health policies and implement better programmes and services. Resolving this issue should be correlated with the vital reproductive health programmes regarding maternal and child health. Unintended childbearing may be a key product measure for such interventions and understanding and addressing its determinants could improve these efforts.

METHODS AND DATA SOURCE

Data of this study were obtained from the 2007 IDHS. The 2007 IDHS is a countrywide sample survey carried out by the Central Bureau of Statistics (CBS) in cooperation with the Ministry of Health (MoH), National Family Planning Coordinating Board (NFPCB/BKKBN), and ORC Macro International. This periodic survey is aimed to obtain the latest information on fertility levels; fertility preferences; infant and child mortality levels; and maternal and child health. This information is intended at serving and supporting policy makers and programme planners in assessing and designing programmes and interventions for improving family planning and reproductive health services in the country.

The 2007 IDHS had a sample of 41,131 households, 40,701 of whom were successfully interviewed (response rate: 99%). Among the households interviewed, 34,227 women were identified as eligible respondents, but interviews were completed among 32,895 women (response rate: 96%). The women respondents were asked questions about their socio demographic background, their children, their knowledge and use of contraceptives, their children's health, reproductive health, and other information as well. Among these women, 15,127 had at least one birth during five years preceding the survey date. From these respondents, women whose pregnancies were mistimed or unwanted were identified. These women were asked the planning status of the most recent birth; whether the birth was mistimed, unwanted or was born according to plan. The variables of the study derived from the 2007 IDHS questionnaires are shown in Table 1 and Table 2.

This study used bivariate tables and multivariate logistic regression to investigate the relationship between women's pregnancy intention status and a number of socio-demographic variables (maternal age, previous birth intervals, number of previous births/parity, level of education, place and region of residence, ever used of contraception, husband's desire for family size, and economic status). Cross-tabulations was utilised on the relevant identified demographic and socio economic variables to discover patterns among the research variables. The multivariate logistic regression analyses were also utilised to identify the variables which are simultaneously associated with the women's pregnancy intention status (p value $< .05$). All statistical tests were done using the Statistical Package for Social Sciences (SPSS for Windows version 14) (SPSS 2006). All tables and figures, however, were produced using Microsoft Excel 2000 spreadsheet (Microsoft Corporation 2000). A weighting factor was applied to all observations in all study analysis to balance the 2007 IDHS regional response rate and also the sampling design. All findings presented herein are weighted.

The term ‘unintended pregnancy’ and ‘unintended childbearing’ are used interchangeably in this research due to the nature of the data available for the analysis: women who had most recent births during five year preceding the interview date were asked about their pregnancy intention status if only their pregnancies ended in a live birth. Those women were not asked about their pregnancy intention status if they had never had a live birth during five years before the survey date, regardless of how many pregnancies they might have had. Thus unintended pregnancies that ended in abortion were absent in this analysis.

Table 1. Description of the Dependent Variables, 2007 IDHS

Model	Variable	Labels
First Model	Mistimed Pregnancy	1 = Yes (Mistimed pregnancy / wanted to wait until later) 0 = No (Others)
Second Model	Unwanted pregnancy	1 = Yes (Unwanted pregnancy / Did not want to become pregnant/wanted no more children) 0 = No (Others)
Third Model	Unintended pregnancy	1 = Yes (Unintended pregnancy / (Mistimed + Unwanted)) 0 = No (Wanted pregnancy)

Source : Calculated from the 2007 IDHS

Table 2. Description of the Independent Variables, 2007 IDHS

Category	Variable	Labels
Demographic	Age	0 = 15-24 years 1 = 25-34 years 2 = 35-49 years
	Preceding Birth Interval	0 = Less than 3 years 1 = 3 years or more 2 = First birth / no previous birth
	Region of Residence	0 = Java Bali 1 = Outer Java Bali I 2 = Outer Java Bali II
Socio-economic	Type of Residence	0 = Rural 1 = Urban
	Education	0 = No education 1 = Primary/elementary 2 = Secondary and higher 3 = Higher
	Wealth Index	0 = Poor 1 = Moderate 2 = Rich
Proximate	Ever use of Contraception	0 = No/Never used contraceptive 1 = Yes/Ever used contraceptive
	Husband's desire for family size	0 = Agree 1 = Disagree
	Number of previous births (Parity)	0 = 0-1 children 1 = 2-3 children 2 = 4-5 children 3 = >6 children

Source : Calculated from the 2007 IDHS

RESULTS

Women's socio-demographic characteristics

Table 3 shows the demographic characteristics of 15,127 women who had recent births during five years before the interview date. Roughly half (51.1%) of these women were aged between 25-34 age group. About 22.8% of them were young (15-24 age group); and just above one-fourth (26.1%) of these mothers were older (35-49 age group). In regards to the birth intervals, almost half of all births (47.9%) were spaced by three years or more from the previous birth; about one out of three births (34.5%) were first births; and few births (17.6%) were spaced quite closely from the previous birth (less than three years). Furthermore, the highest percentage of pregnancies and births (57.6%) occurred in Java Bali region. Almost three out of ten pregnancies occurred in Outer Java Bali I region (27.9%), and 14.5% occurred in Outer Java Bali II region.

Table 3. Demographic characteristics of women who were pregnant during 5 years before the survey date, 2007 IDHS

Variable	Characteristics	Frequency	Percent
Age	0 = 15-24 years	3,452	22.8
	1 = 25-34 years	7,723	51.1
	2 = 35-49 years	3,952	26.1
Region of Residence	0 = Java Bali	8,709	57.6
	1 = Outer Java Bali I	4,218	27.9
	2 = Outer Java Bali II	2,200	14.5
Preceding Birth Interval	0 = less than 3 years	2,659	17.6
	1 = 3 years or more	7,253	47.9
	2 = First birth / no previous birth	5,215	34.5

Source : Calculated from the 2007 IDHS

Moreover, the majority of mothers live in rural areas (57.6%), while 42.4% live in urban areas (Table 4). With regard to the educational attainment of mothers, more than two out of five mothers reached elementary level only (41.4%) while about 3.4% had no education. Almost half of all mothers have completed secondary or high school education (47.5%), and the remaining 7.7% completed either academy or university. In terms of wealth index, two out of five mothers (39.0%) were rich and 41.0% were poor while only one-fifths of the respondents were moderate.

Table 4. Socio-economic characteristics of women who were pregnant during 5 years before the survey date, 2007 IDHS

Variable	Characteristics	Frequency	Percent
Type of Residence	0 = Rural	8,719	57.6
	1 = Urban	6,407	42.4
Education	0 = No education	510	3.4
	1 = Primary/elementary	6,260	41.4
	2 = Secondary and higher	7,187	47.5
	3 = Higher	1,170	7.7
Wealth Index	0 = Poor	6,203	41.0
	1 = Moderate	3,027	20.0
	2 = Rich	5,897	39.0

Source : Calculated from the 2007 IDHS

Women's proximal characteristics

Table 5 depicts the percent distribution of women by proximate determinants, which are contraceptive use, number of previous births, and husband's desire for family size. Almost nine out of ten mothers (89.7%) ever used contraceptives and only 10.3% were nonusers. About half (48.0%) of the mothers had 2-3 living children at the time of conception, while more than one-third (36.4%) had 0-1 living children at the time of conception, some (11.5%) had already 4-5 living children at the time of the conception, while very few (4.1%) had six or more living children at the time of the conception. Moreover, mothers who had same desired number for family size with their husbands comprised almost two-thirds (65.6%) of the total respondents. There were also some (17.7%) mothers who disagree with their husband about ideal number of children, and one-sixth (16.7%) of mothers do not know how many children do their husband's desire to have.

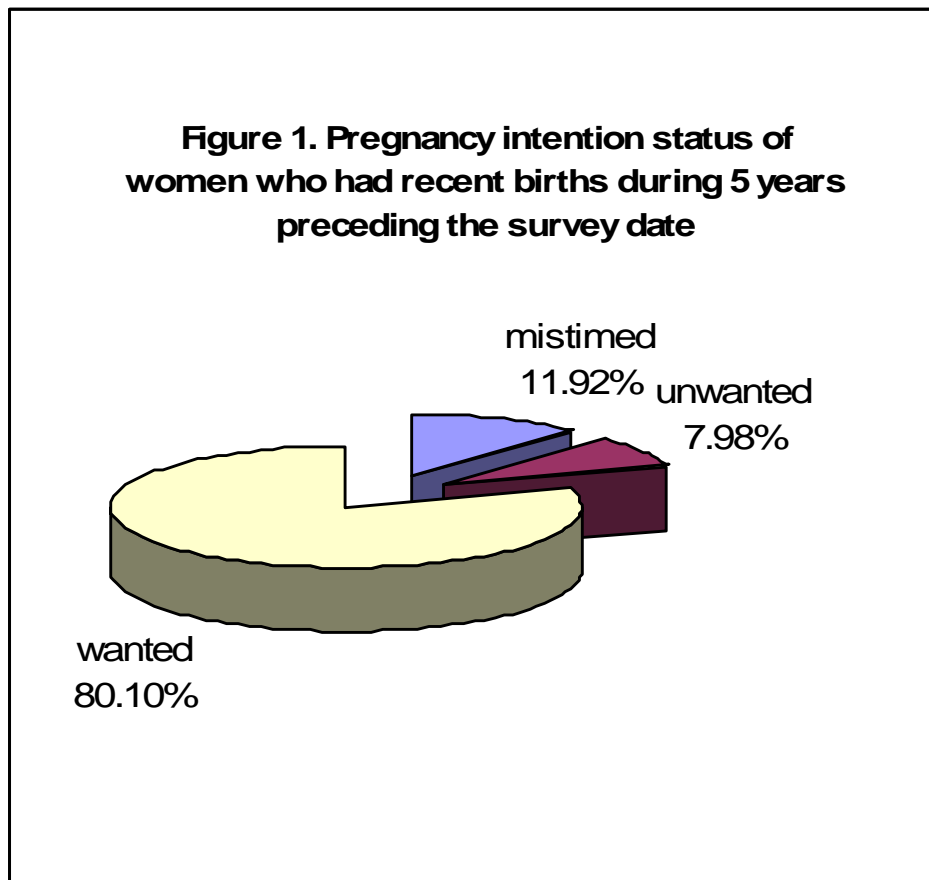
Table 5. Proximal characteristics of women who were pregnant during 5 years before the survey date, 2007 IDHS

Variable	Characteristics	Frequency	Percent
Ever use of contraception	0 = No/Never used contraceptive	1,554	10.3
	1 = Yes/Ever used contraceptive	13,579	89.7
Husband's desire for family size	0 = Agree (similar between husband and wife)	9,923	65.6
	1 = Disagree (different between husband and wife)	2,672	17.7
	Missing (Don't know)	2,532	16.7
Number of previous births (Parity)	0 = 0-1 children	5,505	36.4
	1 = 2-3 children	7,263	48.0
	2 = 4-5 children	1,743	11.5
	3 = >6 children	616	4.1

Source : Calculated from the 2007 IDHS

Women's pregnancy intention status

Figure 1 presents the percent distribution of women by how they classify their pregnancy: wanted then, wanted later, or not at all. The majority of women classified their pregnancy as wanted (80.10%), while 19.90% classified their pregnancy as unintended consisting of 11.92% wanted later or mistimed and 7.98% wanted no more or unwanted.



Bivariate Cross-Tabulation Analyses

Bivariate or cross-tabulation was used initially to determine the association between different hypothesized predictors or variables and pregnancy intention status. Significance testing using the chi-square test statistics showed a very high association of all these variables except economic status (Table 6, 7, and 8).

Socio-Demographic Determinants

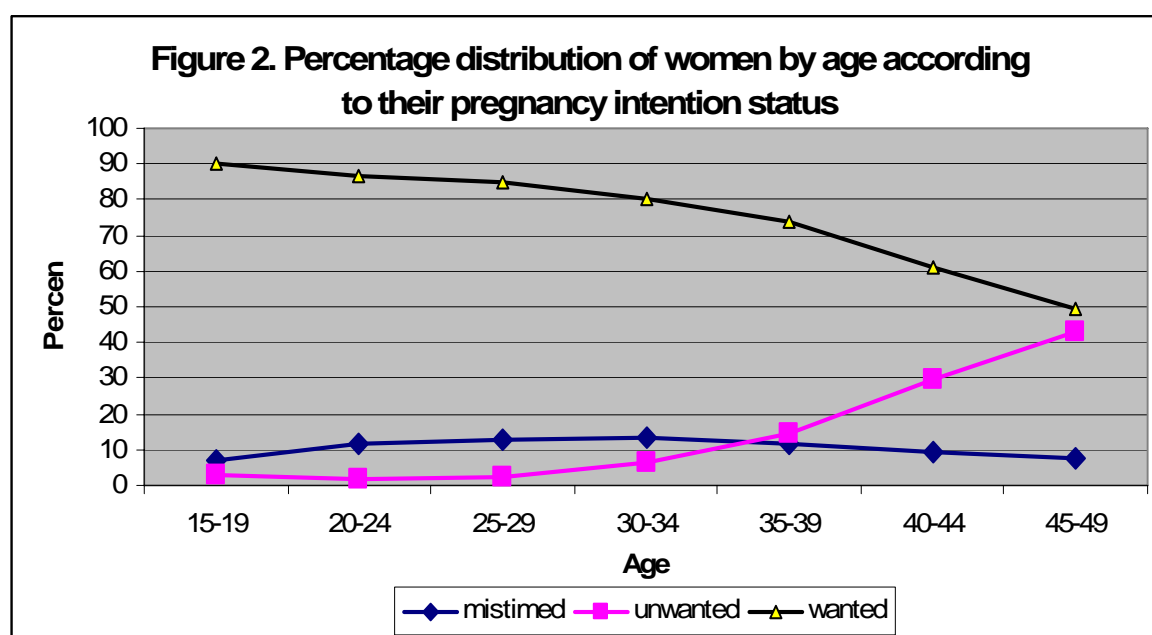
Maternal age. Expectedly, the highest occurrences of unintended pregnancies/childbearing occurred to women aged 35-49 years old and the odds of unintended pregnancy seemed to be increasing with age. Table 6 shows that mothers whose age was between 35 and 49 have the highest tendency to classify their pregnancy as unwanted (20.9%), while mothers whose age was between 25-34 have the highest percentage of classifying their pregnancies/childbearing as mistimed (13.0%). Table 6 also shows that the older the mothers, they have higher unwanted pregnancies (also see Figure2).

Table 6. Cross-tabulation analyses between pregnancy intention status and demographic characteristics, 2007 IDHS

Variable	Characteristics	Wanted	Mistimed	Unwanted	Unintended*	Number of women
Age**	0 = 15-24 years	87.31	11.0	1.7	12.7	3,451
	1 = 25-34 years	82.8	13.0	4.2	17.2	7,723
	2 = 35-49 years	68.6	10.5	20.9	31.4	3,952
Region of residence**	0 = Java Bali	79.5	11.7	8.8	20.5	8,709
	1 = Outer Java Bali I	81.8	11.7	6.8	18.2	4,218
	2 = Outer Java Bali II	79.3	13.9	6.8	20.7	2,200
Preceding Birth interval**	0 = less than 3 years	59.8	26.8	13.4	40.2	2,659
	1 = 3 years or more	77.1	11.5	11.4	22.9	7,253
	2 = First birth	94.7	4.9	0.4	5.3	5,215

Source : Calculated from the 2007 IDHS

Legend: *Unintended is the sum of mistimed and unwanted pregnancies**Significant at P-value < 0.05



Previous birth interval. The highest rate of unintended pregnancies/childbearing (40.2%) occurred to women whose previous birth intervals were close (less than 3 years). From this figure, around one-fourth pregnancies/childbearing was considered mistimed (26.8%). This was differing from those of properly spaced births/pregnancies e.g. 11.5% for 3 years or more and 4.9% for the first births. Accordingly, mothers who classified their pregnancy as unwanted were also those whose previous birth intervals were close, 13.4% for less than three years while only 11.4% for three years or more and 0.4% for first births (Table 6).

Region of residence. The rate of unintended pregnancies seemed to be highest (20.7%) in Outer Java Bali II region (13.9% mistimed and 6.8% unwanted), followed by Java Bali (20.5%) with 11.7% mistimed and 8.8% unwanted, while mothers who were in Outer Java Bali I had the lowest mistimed pregnancies (11.4%) and unwanted childbearing (6.8%). Mothers who reside in Java Bali and Outer Java Bali I regions were less likely to classify their pregnancies as mistimed compared to the mothers who reside in Outer Java Bali II region. However, residents in Outer Java Bali I and Outer Java Bali II regions were less likely to declare their childbearing as unwanted compared to residents in Java Bali region.

Socio-Economic Determinants

Place of residence. Table 7 shows that the rate of unintended pregnancies/childbearing was higher among mothers living in the urban areas. Accordingly, unwanted pregnancies were also higher among mothers who live in the urban areas (9.0% vs. 7.2%). Moreover, the rates of mistimed pregnancies occurred from mothers living in urban areas were also higher than those mothers who live in rural areas (12.5% vs. 11.5%).

Table 7. Cross-tabulation analyses between pregnancy intention status and socio-economic characteristics, 2007 IDHS

Variable	Characteristics	Wanted	Mistimed	Unwanted	Unintended*	Number of women
Type of residence**	0 = Rural	81.3	11.5	7.2	18.7	8,719
	1 = Urban	78.5	12.5	9.0	21.5	6,407
Education**	0 = No education	70.2	9.8	20.0	29.8	510
	1 = Primary	79.2	11.1	9.7	20.8	6,260
	2 = Secondary	81.4	12.5	6.1	18.6	7,187
	3 = Higher	81.5	13.5	5.0	18.5	1,170
Wealth Index	0 = Poor	79.8	12.2	8.0	20.7	6,203
	1 = Moderate	80.2	12.2	7.6	19.8	3,027
	2 = Rich	80.3	11.5	8.2	19.7	5,897

Source : Calculated from the 2007 IDHS

Legend: *Unintended is the sum of mistimed and unwanted pregnancies**Significant at P-value < 0.05

Level of education. The highest rate of unintended pregnancies/childbearing (29.8%) came from the mothers who have no education. Consequently, relatively higher rates of unwanted pregnancies/childbearing occurred among this group also (20.0%). Compared with the unwanted pregnancies rates of better educated mothers, it is clearly that less educated mothers were more prone to unwanted pregnancies. On the other hand, mothers who finished secondary or high school and those who completed academy or university have higher percentage of mistimed pregnancies/childbearing (12.5% and 13.5%) respectively. Data also reveals that less educated mothers have lower mistimed pregnancies (9.8% for no education and 11.1% for primary level).

Economic status. Higher rates of unintended pregnancies/childbearing seemed to occur from mothers who were poor (20.7%). Poor mothers have also the higher mistimed pregnancies (12.2%), while the rate of unwanted pregnancies/childbearing was higher among the rich mothers (8.2%).

Proximate Determinants

Table 8 shows women's pregnancy intention status by contraceptive use, husband's desire for family size and the number of previous births (parity). The data revealed that the differences of whether or not the pregnancy is intended are statistically significant across all the proximate variables.

Table 8. Cross-tabulation analyses between pregnancy intention status and proximal determinants, 2007 IDHS

Variable	Characteristics	Wanted	Mistimed	Unwanted	Unintended*	Number of women
Ever use of Contraception**	0 = No	82.6	10.3	7.1	17.4	1,554
	1 = Yes	79.8	12.1	8.1	20.2	13,579
Husband's desire For family size**	0 = Agree	82.5	10.7	6.8	17.5	9,923
	1 = Disagree	77.1	13.6	9.3	22.9	2,672
Number of Previous births**	0 = 0-1 children	94.7	5.0	0.3	5.3	5,505
	1 = 2-3 children	77.0	16.1	6.9	23.0	7,263
	2 = 4-5 children	59.2	15.9	24.9	40.8	1,743
	3 = >6 children	46.2	12.5	41.3	53.8	616

Source : Calculated from the 2007 IDHS

Legend: *Unintended is the sum of mistimed and unwanted pregnancies**Significant at P-value < 0.05

Ever used of contraception. Mothers who ever used contraceptives have higher percentage of unintended pregnancies/childbearing consist of 8.1% unwanted and 12.1% mistimed compared with those who were non-users (7.1% for unwanted and 10.3% for mistimed). However, these results should be interpreted with caution because of lack of data to determine contraceptive behaviour at the time of conception hence the analysis is only limited to whether the mother is a contraceptive user in the indefinite past or not. It is not easy to extrapolate the relationship between the occurrence of unintended pregnancies and method of contraception.

Number of previous births/Parity. The number of previous births matters in classifying whether the pregnancies/childbearing of a mother was unintended. Mothers whose number of previous births was large (six and above), were more prone of classifying their pregnancy as unwanted (41.3%). Moreover, the larger the number of previous births a woman had, the greater the risk she had unwanted pregnancies. On the other hand, classifying their pregnancies/childbearing as mistimed were most prevalent (16.1%) to mothers with quite small (2-3) numbers of living children.

Husband's desire for family size. Mothers who agree with their husband about family size were less likely to consider their pregnancies/childbearing as mistimed or unwanted. When the women's desire disagree with their husband about family size, data revealed that they were more likely to have unwanted pregnancies/births than their counterparts (9.3% vs. 6.8%), and they were also more likely than their counterparts to classify their pregnancies/childbearing as mistimed (13.6% vs. 10.7%).

Multivariate Logistic Regression Analyses

Table 9, 10, and 11 present the results of the multivariate logistic regressions in terms of coefficients, level of significance, and odds ratios by each of the hypothesized predictors of mistimed, unwanted, and unintended pregnancies/childbearing. Interestingly, almost all of the hypothesized variables emerged to be significantly related to unintended pregnancy when taken simultaneously.

The logistic regression models are the basis for interpreting the net effects of each hypothesized variable emerging as significant on the likelihood of regarding the pregnancy as mistimed or unwanted. These odds-ratios can be interpreted as the odds of classifying the pregnancies/childbearing for each of the demographic, socio economic and other proximate variables.

The net effects of hypothesized predictors with women's intention of mistimed pregnancies/childbearing are as follows (Table 9):

- For each extra year of age the likelihood of a woman to classify her pregnancy as mistimed were decreased by 7%.
- A mother whose birth intervals was closely spaced (less than three years) were 2.44 times more likely to classify their pregnancy as mistimed than their counterparts whose births interval was not closely spaced (three years or more).
- Women who reside in Java Bali region were 1.25 times more likely to classify the pregnancy as mistimed compared to those women who reside in Outer Java Bali I region.
- Mothers who live in urban areas were 20% more likely to classify the pregnancy as mistimed compared to those mothers living in rural areas.
- Women who have finished secondary and higher education were 2.12 times more likely to declare the pregnancy as mistimed compared to those women who have no education.
- Poor mothers were 1.22 times more likely to classify the pregnancy as mistimed compared to those rich mothers.
- Women who ever used contraceptives were 37% more likely to classify the pregnancy as mistimed compared with women who were non-users of contraceptives.
- Mothers who disagree with their husband about family size were 20% more likely to regard their pregnancy as mistimed compared to their counterparts.
- For each extra child a woman already had the likelihood to classify her pregnancy as mistimed was increased by 20%.

Table 9. Coefficients, Odds ratios, and P-value from logistics regression model of mistimed pregnancy, after controlling for other factors, 2007 IDHS

Variable	Category	Coefficients	Odds ratio	Sig.
Age	Continuous variable	-0.77	0.93	2.06E-28
Preceding Birth Interval	0 = less than 3 years	0	1	
	1 = 3 years or more**	-0.9	0.41	1.67E-38
	2 = First birth / no previous birth**	-2.08	0.13	7.5E-100
Region of Residence	0 = Java Bali	0	1	
	1 = Outer Java Bali I**	-0.23	0.8	0.001605
	2 = Outer Java Bali II	-0.09	0.91	0.287621
Type of Residence	0 = Rural	0	1	
	1 = Urban**	0.18	1.2	0.009474
Education	0 = No education	0	1	
	1 = Primary	0.33	1.4	0.087343
	2 = Secondary and higher**	0.75	2.12	0.000216
Wealth Index	0 = Poor	0	1	
	1 = Moderate	0.05	1.05	0.563708
	2 = Rich**	-0.2	0.82	0.019088
Ever use of contraception	0 = No/Never used contraceptive	0	1	
	1 = Yes/Ever used contraceptive**	0.32	1.37	0.008324
Husband's desire for family size	0 = Agree	0	1	
	1 = Disagree**	0.19	1.2	0.006385
Number of previous births	Continuous variable**	0.18	1.2	1.83E-09

Source : Calculated from the 2007 IDHS

Legend: **Significant at P-value < 0.05

Preceding birth interval was the most significant determinant of why women regard their pregnancy as *mistimed*. Maternal age ranked as second most influential factors and the level of education was third. The number of previous births was on the fourth level. The husband's desire for family size also emerged as strong predictors in fifth order of significance. On the sixth rank was the region of residence, followed by the economic status on the seventh. Ever use of contraceptives was also significant on the eighth place. The place of residence which also emerged as strong determinant came in at the ninth place.

The net effects of hypothesized predictors with women's intention of unwanted pregnancies/childbearing are as follows (Table 10):

- For each extra year of age the likelihood of a woman to classify her pregnancy as unwanted were increased by 10%.
- A mother whose birth intervals was closely spaced (less than three years) were 1.45 times more likely to classify their pregnancy as unwanted than their counterparts whose births interval was not closely spaced (three years or more).
- Women who reside in Java Bali region were about 2 times more likely to classify the pregnancy as unwanted compared to those women who reside in Outer Java Bali I and Outer Java Bali II regions..
- Mothers living in urban areas were 31% more likely to classify the pregnancy as unwanted compared to those mothers who live in rural areas.
- Women who have no education were 1.41 times more likely to declare the pregnancy as unwanted compared to those women who have finished secondary and higher education.
- It can be noted that wealth index of mothers is not statistically significant to unwanted pregnancy.
- Women who ever used contraceptives were 60% more likely to classify the pregnancy as unwanted compared with women who were non-users of contraceptives.
- Mothers who disagree with their husband about family size were 34% more likely to regard their pregnancy as unwanted compared with their counterparts
- For each extra child a woman already had the likelihood to classify her pregnancy as unwanted were increased by 59%.

Table 10. Coefficients, Odds ratios, and P-value from logistics regression model of unwanted pregnancy, after controlling for other factors, 2007 IDHS

Variable	Category	Coefficients	Odds ratio	Sig.
Age	Continuous variable	0.09	1.1	1.68E-28
Preceding Birth Interval	0 = less than 3 years	0	1	
	1 = 3 years or more**	-0.37	0.69	7.32E-05
	2 = First birth / no previous birth**	-2.55	0.08	2.97E-14
Region of Residence	0 = Java Bali	0	1	
	1 = Outer Java Bali I**	-0.66	0.52	2.11E-11
	2 = Outer Java Bali II**	-0.73	0.48	6.56E-09
Type of Residence	0 = Rural	0	1	
	1 = Urban**	0.27	1.31	0.003132
Education	0 = No education	0	1	
	1 = Primary	-0.1	0.91	0.536897
	2 = Secondary and higher**	-0.35	0.71	0.048592
Wealth Index	0 = Poor	0	1	
	1 = Moderate	-0.12	0.89	0.298887
	2 = Rich	-0.09	0.91	0.394921
Ever use of contraception	0 = No/Never used contraceptive	0	1	
	1 = Yes/Ever used contraceptive**	0.47	1.6	0.002712
Husband's desire for family size	0 = Agree	0	1	
	1 = Disagree**	0.29	1.34	0.000858
Number of previous births	Continuous variable**	0.46	1.59	7.15E-49

Source : Calculated from the 2007 IDHS

Legend: **Significant at P-value < 0.05

Number of previous births was the most influential factor why women regard their pregnancy as *unwanted*. Maternal age ranked as second most significant determinant and preceding birth interval was third. And the region of residence was on the fourth level. The husband's desire for family size also emerged as strong predictors in fifth order of significance. On the sixth rank was ever use of contraceptives, followed by the region of residence on the seventh. The level of education was also significant on the eighth place.

The net effects of hypothesized predictors with women's intention of unintended pregnancies/childbearing are as follows (Table 11):

- For each extra year of age the likelihood of a woman to classify her pregnancy as unintended were increased by 1%.
- A mother whose birth intervals was closely spaced (less than three years) were 2.33 times more likely to classify their pregnancy as unintended than their counterparts whose births interval was not closely spaced (three years or more).
- Women who reside in Java Bali region were about 1.5 times more likely to classify the pregnancy as unintended compared to those women who reside in Outer Java Bali I and Outer Java Bali II regions.
- Mothers who live in urban areas were 27% more likely to classify the pregnancy as unintended compared to those mothers living in rural areas.
- It can be noted that educational attainment of women is not statistically significant to unintended pregnancy.
- Poor mothers were 1.23 times more likely to classify the pregnancy as unintended compared to those rich mothers.
- Women who ever used contraceptives were 47% more likely to classify the pregnancy as unintended compared with women who were non-users of contraceptives.
- Mothers who disagree with husband about their family size were 30% more likely to regard their pregnancy as unintended compared to their counterparts.
- For each extra child a woman already had the likelihood to classify her pregnancy as unintended were increased by 58%.

Table 11. Coefficients, Odds ratios, and P-value from logistics regression model of unintended pregnancy, after controlling for other factors, 2007 IDHS

Variable	Category	Coefficients	Odds ratio	Sig.
Age	Continuous variable	-0.02	1.01	0.006237
Preceding Birth Interval	0 = less than 3 years	0	1	
	1 = 3 years or more**	-0.84	0.43	8.8E-44
	2 = First birth / no previous birth**	-1.74	0.18	6.07E-80
Region of Residence	0 = Java Bali	0	1	
	1 = Outer Java Bali I**	-0.48	0.62	3.2E-14
	2 = Outer Java Bali II**	-0.4	0.67	2.48E-07
Type of Residence	0 = Rural	0	1	
	1 = Urban**	0.24	1.27	4.96E-05
Education	0 = No education	0	1	
	1 = Primary	-0.02	0.98	0.90725
	2 = Secondary and higher	0.17	1.18	0.224762
Wealth Index	0 = Poor	0	1	
	1 = Moderate	0.01	1	0.981737
	2 = Rich**	-0.21	0.81	0.003597
Ever use of contraception	0 = No/Never used contraceptive	0	1	
	1 = Yes/Ever used contraceptive**	0.38	1.47	0.000162
Husband's desire for family size	0 = Agree	0	1	
	1 = Disagree**	0.26	1.3	5.17E-06
Number of previous births	Continuous variable**	0.46	1.58	5.35E-72

Source : Calculated from the 2007 IDHS

Legend: **Significant at P-value < 0.05

Preceding birth interval was the strongest determinant of why women regard their pregnancy as *unintended*. The number of previous births ranked second most significant factor and the region of residence was third. The husband's desire for family size was on the fourth level. The place of residence also emerged as influential factors in fifth order of significance. On the sixth rank was ever use of contraceptives, followed by the economic status on the seventh. Maternal age was also significant on the eighth place.

DISCUSSION

This research intended to observe the determinants of mistimed and unwanted pregnancy among ever married women in Indonesia. The respondents were 15,127 women of reproductive age (15-49 years old) who had their most recent birth in the last five years before the interview date of the 2007 IDHS. The study examined the significant factors that influence Indonesian women's pregnancy intention status and tried to evaluate the differences in pregnancy intention status among ever married women in Indonesia based on their demographic, socio economic characteristics and other proximate determinants.

About one in five women who had most recent birth in the five year period preceding the survey date reported an unintended pregnancy, mostly mistimed. This prevalence does not reflect the real magnitude of the problem, but can rather be considered as an underestimate since it was only approximated among ever-married women. Of the 15,127 births, 19.9% were classified as unintended consisting of 11.9% mistimed and 8.0% unwanted. Majority of the respondents belonged to the 25-34 age groups. A huge difference in distribution of women had been observed for the region of residence with 57.6% of women residing in Java Bali region and some women (27.9%) in Outer Java Bali I region and few women (14.5%) in Outer Java Bali II region.

Almost half (44.8%) of the mothers do not have more than primary level education, comprises about 41.4% have finished primary education and 3.4% proportion of no education at all. Around 47.5% of the women respondents have finished secondary education with only 7.7% have finished academy or university. As regards the economic status, which was determined using their wealth index, slight majority of women respondents were poor (41.0%) and 39.0% were rich. Women respondents have an average number of 2-3 living children at the time of the conception. With regards the use of contraception, 89.7% of mothers have ever used of contraceptives and only 10.3% are nonusers.

Findings of this research confirmed that when using the bivariate analysis or cross-tabulation with chi-square statistics to examine the level of relationship between the dependent and independent variables, almost all hypothesized determinants (maternal age, previous birth intervals, ever used of contraception, husband's desire for family size, number of previous births, place and region of residence, and level of education) except economic status/wealth index were significantly associated with the pregnancy intention status of Indonesian women.

Data analysis at bivariate table showed a strong association between pregnancy intention status and maternal age. Women aged 15-24 years old were less likely to have unintended pregnancy compared to those aged 25–34 years old. Moreover, those aged 35-49 years old were most likely to report unintended pregnancy. The most understandable explanation of this result is that the latter group as opposed to the former group could have completed their desired family size. It has revealed that the higher the age of mother, the higher the odds of experiencing an unintended pregnancy. It corroborates the research that conducted in Nigeria (Okonofua, Clifford, Halen, Patrick, and Agnes 1999) and Iran (Abbasi-Shavazi 2004).

Number of previous births or parity was strongly related with the odds of unintended pregnancy. The more children a mother already had, the more likely she was to classify her pregnancy as unintended. The length of the preceding birth interval was also statistically associated to unintended pregnancy. The pattern of the relationship between preceding birth interval and unintended pregnancy is that longer birth intervals usually reduced the likelihood of a child being reported as mistimed or unwanted, and first births (those with no preceding interval) were least likely to be reported as mistimed or unwanted. Husband's desire for family size was also significantly related with mistimed or unwanted pregnancy. Women who disagree with husband about their family size were more likely to consider their pregnancy as mistimed or unwanted.

The significant differences in pregnancy intention status that appeared by region and area of residence imply that contraceptive services need to be improved in urban areas and in Java Bali and Outer Java Bali II region. While cross-tabulation analyses from DHS surveys conducted in other countries suggest that rural mothers are more likely than their counterparts to have unintended pregnancies, the present study discovered that living in urban areas increased the probability of having unwanted or mistimed pregnancy compare with living in rural areas. The heavy migration from rural to urban areas might have overburdened contraceptive services there. Moreover, rural women's ideal numbers of children tend to decrease when they migrate to urban areas, where living space is limited and the cost of living is higher. Even if contraceptives are obtainable, mothers who have recently moved to urban areas may lack the knowledge and skills required to achieve their modified ideal family sizes, or they may consider a formerly desired pregnancy to be unwanted or mistimed.

The bivariate analysis of pregnancy intention status and maternal education do not show the expected effect in case of mistimed childbearing, there is an inverse direction with the odds of having a mistimed child. Contrary to expectation, women who had higher educational attainment were more likely than those women who had lower educational attainment to have had a mistimed pregnancy. Moreover, among women with unintended pregnancies, those pregnancies were more likely to be mistimed among women who finished academy or university, and they were more likely to be unwanted among women with no education. This is a corroboration of a similar result from a research conducted in Nigeria (Okonofua, Odimegwu, Aina, Daru, and Johnson 1996) and a cross national study by Westoff (1981).

One interpretation for this incidence might be that as women become more aware of the desirability of family planning, they may come to expect every birth to be an outcome of careful planning. When the expectation is not met, the informed women (those who believe that they could manage the timing of their pregnancies or their family size) are more likely to classify pregnancies as mistimed than women who do not consider those issues of childbearing can be under their control. In Indonesia, the persons who are likely to hold the vision of family planning earliest are the more educated people. Such individuals may be more likely to report higher mistimed pregnancies than those in lower educational level. Less educated mothers might be less likely than more educated mothers to have mistimed childbearing because they might have more modest expectations of their ability to control the timing of their pregnancies. Westoff (1981) argued that the higher rate of mistiming pregnancies results from a redefining of pregnancies as mistimed that would have been unthinkingly accepted in the past.

Another possible reason for a positive relationship between pregnancies classified mistimed and higher level of mother's educational attainment is that women with better education are more likely than those with poor education to lead the way in general, not only in lowering their ideal number of children but also in ignoring traditional norms related to child spacing such as postpartum sexual abstinence and prolonged breastfeeding, even before they have fully absorbed the reality of modern contraceptive standards. Therefore, those social leaders may end up having still mistimed pregnancies. This form of relationship is likely to be transitional; it should be changed as access to contraceptives expands and its acceptance grows.

Researches in other countries have illustrated that poverty is statistically related with the rates of unintended births (Williams 1991, Anderson 1981). There are no data in the Demographic and Health Survey that quantify poverty directly. Hence, a maternal economic status was indirectly measured by creating a compound index based on household characteristics and possessions. The output of the cross-tabulation found that the association between the wealth index and the occurrence of mistimed and unwanted pregnancy was weak or nonexistent in Indonesia, which advises that there may be many factors that confuse the association between wealth index and unintended pregnancy. This wealth index was not significantly associated to mistimed or unwanted pregnancy; even then its form of relationship is not reliable: better economic status decreases the likelihood of mistimed pregnancy but elevates the likelihood of unwanted pregnancy.

One important factor of unintended childbearing is the contraception use. Experience using a contraceptive was significantly related with the odds of unintended childbearing in this study. Nevertheless, the association between the two variables in the analysis is in the opposite direction. Past users of a family planning method were more likely than nonusers to report their pregnancy had been mistimed or unwanted. Users of a contraceptive method might have higher expectations about limiting or spacing their pregnancies, and therefore they were more likely to view a pregnancy as mistimed or unwanted.

The results of this analysis shed light on the important concerns on failure of contraception and the quality of reproductive health services. This research gives valuable information that providing contraceptive methods to target more women is not sufficient to avoid unintended childbearing, and that this condition should be linked with high quality service and information to prevent unintended childbearing (Jain 1999, Blanc, Curtis, and Croft 2002). In other words, it might be timely to improve the qualitative aspects of family planning services rather than only their quantitative aspects. Looking at the characteristics of family planning services and the way they are conveyed are major challenges to enhancing the quality aspects of reproductive health programmes. The variety of appropriate family planning methods, their quality and efficacy, knowledge about utilization of contraceptive methods and the women's agreement are crucial components to be assessed and addressed in Indonesia. Furthermore, other wide-ranging and holistic socioeconomic services and programmes should be given attention too.

Previous researches from other countries found that nonuse and ineffective use of contraceptives are a forerunner to a huge majority of unintended pregnancies. According to Burnhill (1994), about half of all unintended pregnancies in the United States in 1987 arose among 10% of women age 15 to 44 who were not using contraception. This is similar to the findings of Forrest (1994), the odds of unintended pregnancy in the United States was high among both misusers and nonusers of family planning methods. Correspondingly, discontinuations of contraception and changing contraceptive methods have been underlined as significant risk factors in unintended pregnancy (Rosenberg, Waugh, and Long 1995). It is approximated that 40% of one million unintended pregnancies that arise each year in the United States occur among women who are currently using family planning methods either due to contraceptive failure or due to user failure while 60% occur among women who either discontinue contraceptive use or switch to other methods.

In view of the above scenario, the occurrences of unintended pregnancies that have been observed in this study indirectly suggest that there is an unmet need for effective family planning methods in Indonesia. The level of mistimed pregnancies obviously suggests an unmet need for better spacing while the rate of unwanted pregnancies suggests an unmet need for limiting number of children (see Westoff and Bankole 1995). There should be an increase in people's access to family planning methods in order to meeting that need. There is a need for better information, education, and communication (IEC) programmes on the subject of preventing unintended pregnancy, whether through sexual abstinence or through use of family planning methods (Brown and Eisenberg 1995). It is important to note that every pregnancy should be planned and wanted at the time of pregnancy.

A further in-depth statistical analyses using multivariate logistic regression found slight different results. Not all variables which initially emerged to be statistically significant to unintended pregnancy were statistically significant predictors of unintended pregnancy after taken simultaneously. One factor which was indicated earlier as statistically significant later appeared to be not statistically associated with *unintended* pregnancy when taken simultaneously, this was level of education. Economic status or wealth index, moreover, was not statistically significant to *unwanted* pregnancy when taken simultaneously. However, all variables including economic status and level of education were statistically significant to *mistimed* pregnancy when taken simultaneously.

Based on the results of multivariate logistic regression on unintended pregnancy, there was no significant relationship between maternal education and the occurrence of unintended pregnancy after taken simultaneously. This corroborates findings from previous research in Japan (Goto 2002). In Japan, the majority of women are well educated and they choose to have no children or to have fewer children, and therefore there is no significant difference in the occurrence of unintended pregnancy among different educational attainment of Japanese women. In case of Indonesia, the literacy rate of women is still not high and large numbers of women are still poorly educated (not higher than primary school), and other social cultural aspects significantly affect the pregnancy intention status of women, thus maternal education was not statistically significant to unintended pregnancy. Nonetheless, it should not be concluded that maternal education is not associated to pregnancy intention status and hence we should not ignore the value of education for the better life of women.

Various factors that influence mistimed and unwanted pregnancies have been examined. Multivariate logistic regression was utilised to deal with the impacts of each of the factors net of the influences of other variables in the study. For mistimed childbearing, the most significant determinants are preceding birth interval, age of mother, educational attainment, and number of previous births or parity. For unwanted childbearing, the most significant determinants are number of previous births or parity, age of mother, preceding birth interval, and region of residence. The findings suggest that a large number of mothers by and large would have preferred to have longer birth intervals if they could have, and that a sizable proportion of mothers indirectly indicated an inclination for limiting family size either because of their high parity or because of their age at the time of pregnancy.

This study observed that indeed, unintended childbearing is prevalent among ever married women in Indonesia. Unintended childbearing occurs among almost all populations of Indonesian women, but the occurrence is comparatively more frequent in some particular groups: women with pregnancies which are closely spaced from the previous birth, women with high parity, women who disagree with their husband about their family size, poorer women, and older women. Taken together, it can also be regarded as failure of a sizable proportion of these women in planning their pregnancies. The level of unintended pregnancies/births across the different socio demographic backgrounds of the Indonesian women diverges considerably but remains a widespread problem. It is quite apparent that the rate of unintended pregnancies/births both mistimed and unwanted is still quite high in all regions and needs to be given special consideration.

SUMMARY AND CONCLUSION

The present research has identified the principal cause of occurrence of unintended pregnancy which facilitates in order to comprehend and properly tackled by the family planning programmes. The analyses have also discovered who have the highest likelihood of unintended pregnancy and assists the policy makers and programme managers to concentrate on a few specific identified aspects of the programme and enhance the efficacy of contraceptive services in term of information on family planning methods and access to the reproductive health services. If the family planning intervention focuses on reducing unintended pregnancy and aiming to make all pregnancy being a result of careful planning, the intervention should concentrate on these issues so that the general health status of the mothers and children can be enhanced with proper birth spacing and limiting.

Having been able to determine the significant factors which affected pregnancy intention status among ever married women in Indonesia, it is important to set down the next steps. There are numerous working programmes in place, but dealing with the issues of unintended childbearing is to target the interventions to its root causes: tackling the high prevalence of mistimed and unwanted childbearing among women with pregnancies which are closely spaced from the previous birth, women with high parity, women who disagree with their husband about their family size, poor women who can not obtain or access contraceptives, and older women who do not want any more children at all.

The findings of the study emphasized crucial points which are justly applicable in planning the programmes to lowering the rates and prevalence of unintended childbearing in Indonesia. There are several particular approaches which should be focusing on those women who are more exposed and highly at risk to this experience. Resolving the problems of unintended childbearing is to assure that women of reproductive age have access to family planning information and services. Addressing the concerns of unintended childbearing is to support to raise women's status so that they would recognize their rights and they can regulate their fertility and thus they can properly space their pregnancies or limit their family size. More information is needed about family planning methods and its appropriate use, as well as better access to family planning services. Hence, the interventions should be to promote reproductive health awareness through IEC programmes about effective utilization of family planning methods. The role of quality of care in increasing women's capability to attain their reproductive goal should be taken into consideration, as disrespectful care, insufficient information or limited contraceptive options might result in underutilise services. A research by Mensch, Arends-Keuning, Jain, and Garate (1997), indeed, revealed that quality of care appreciably influenced women's capability to prevent unintended childbearing.

Therefore, this study suggest more interventions regarding reproductive health services whereby its qualitative aspects should be given special attention and more extensive programmes to raise women's awareness in Indonesia. There is an essential need for significant interventions on the part of the Government. It is necessary to note that local governments also have a vital role to play due to decentralization. The reproductive health policy that would be applied at the national level could be also utilized by the local governments and most important agenda for these concerns could be applied at the local level as well. The objective should be that all pregnancies/childbearing must be planned and the reduction and possible elimination of unintended births should be a priority programme. Resolution of the issues of unintended childbearing will have a positive cost-benefit for families that will enhance self sufficiency among individual families and the general wellbeing of the population.

The findings also indicate the need for further study in some areas. The usual means of classifying pregnancy intention status are possibly insufficient and may under estimate the true rates of mistimed and unwanted pregnancy. Thus, they should be improved to be more appropriate to dissimilar social and cultural background. Furthermore, the natural biases in reporting retrospective feelings concerning pregnancy need to be addressed; mothers' view regarding pregnancy may alter during the conception period as well as after the birth. More study is also needed to investigate the cultural and psychosocial determinants that distinguish women with highest likelihood of unintended childbearing from those women who are able to plan their childbearing.

More information is also needed on the role of contraceptive methods and reproductive health services in avoiding unintended childbearing. Information about the proportion of unintended pregnancy which due to non use of family planning methods, and what proportion stem from method's failure or inconsistent or inaccurate use, and what proportion caused by discontinuation or method's switching would be more significant for policy makers and programme managers to design effective policy. Unluckily, the data source for the research, the 2007 IDHS, did not cover all this kind of information. There is also a need for further study on the interventions to avoid unintended pregnancies as well as on the pattern of unintended pregnancies throughout fertility transition. Prospective cohort analyses on pregnant mothers are also necessary.

Lastly, a number of mothers with mistimed or unwanted pregnancies those who react by resorting to induced abortion maybe do not declare such pregnancies and were not considered in this research accordingly. Qualitative approach such as in-depth interviews perhaps more helpful than quantitative survey in investigating their characteristics, especially in Indonesian societies where abortion is still illegal, restricted, and socially censured.

Research limitations

The 2007 IDHS was a cross-sectional survey that looked retrospectively at pregnancy intention status of ever-married women and its associated determinants. The prevalence of mistimed and unwanted pregnancy might have been underestimated caused by recall biases. Our research findings should be also carefully inferred considering the limitations of the cross-sectional design. Moreover, these analyses investigated ever-married women only. In addition, women with mistimed and unwanted pregnancy are typically exposed to the risk of abortion but the data on abortion in Indonesia is unavailable. All of these factors jointly imply that a major limitation of this research was underestimating the levels of unintended pregnancy.

References

- Abbasi-Shafazi, M.J., M. Hosseini-chavoshi, A. Aghajanian, B. Delavar, and A. Mehyar. 2004. Unintended pregnancies in the Islamic Republic of Iran: Level and Correlates. *Asia-Pacific Population Journal* 19(1):27-38.
- Adetunji, J. 1997. Levels, trends and determinants of unintended childbearing in developing countries. Presented at the annual meeting of the Population Association of America, Washington D.C., USA, March 27-29.
- Adikari, R., K. Soonthornhdada, and P. Prasartkul. 2006. Determinants of Unintended Pregnancy among Currently Married Women in Nepal. Presented at the European Population Conference, Liverpool, UK, June 21-24.
- Anderson, J.E. 1981. Planning status of marital births, 1975-1976. *Family Planning Perspectives* 13(2): 62-70.
- Bitto, A, R.H. Gray, J.I. Simpson, J.T. Queenan, R.T. Kambic, A. Perez, P. Mena, M. Barbato, C. Li, and V. Jennings. 1997. Adverse outcomes of planned and mistimed pregnancies among users of natural family planning: A prospective study. *American Journal of Public Health* 97(3)338-43.
- Blanc, A.K., S. Curtis, and T.N. Croft. 2002. Monitoring contraceptive continuation: links to fertility outcomes and quality of care. *Studies in Family Planning* 33(2): 127-40.
- Bongaarts, J. 1997. Trends in unwanted childbearing in the developing world, *Studies in Family Planning* 28(4):267-77.
- Brown, S.S. and J. Eisenberg. 1995. The best intentions- Unintended pregnancy and the well-being of children and families. National Academy Press, Washington D.C., USA.
- Burnhill, M.S. 1994. Adolescent pregnancy rates in the US. *Contemporary Obstetrics and Gynecology* 39(2):26-30.
- Central Bureau of Statistics (CBS), National Family Planning Coordinating Board (NFPCB), Ministry of Health (MoH), and Macro International Inc. (MI). 2004. *Indonesia Demographic Health Survey 2002-2003*. Calverton, Maryland: CBS and MI.

- Central Bureau of Statistics (CBS), National Family Planning Coordinating Board (NFPCB), Ministry of Health (MoH), and Macro International Inc. (MI). 2008. *Indonesia Demographic Health Survey 2007*. Calverton, Maryland: CBS and MI.
- Eggleston, E. 1997. The effect of unintended pregnancy on low birthweight in Ecuador. Unpublished Dissertation, University of North Carolina, Chapel Hill, NC, USA.
- Eggleston, E. 1998. Unintended pregnancy and use of prenatal care in Ecuador. Presented at the annual meeting of the American Public Health Association, Washington D.C., USA, November 15-19.
- Eggleston, E. 1999. Determinants of Unintended Pregnancy Among Women in Ecuador. *International Family Planning Perspectives* 25(1): 27-33.
- Forrest, J.D. 1994. Epidemiology of unintended pregnancy and contraceptive use. *American Journal of Obstetrics Gynaecology* 170(5): 1485-9.
- Gage, A.J. 1996. Does fertility timing influence the utilization of maternal health care services? Evidence from Kenya and Namibia. *Working papers in African Demography*, University Park, PA, USA: Population Research Institute, Pennsylvania State University, No. AD96-05.
- Goto, A., Y. Seiji, R.R. Michael, and F. Akira. 2002. Factors associated with unintended pregnancy in Yamagata, Japan. *Social Science Medicine* 54:1065-79.
- Hardee, K., E. Eggleston, E.L. Wong, Irwanto, and T.H. Hull. 2004. Unintended Pregnancy and Women's Psychological Well-being in Indonesia. *Journal of Biosocial Science* 36: 617-26.
- Herold, J.M., N.J. Thompson, and M.S. Valenzuela. 1994. Unintended pregnancy and sex education in Chile: a behavioural model. *Journal of Biosocial Science* 26(4):427-39.
- Hull, T.H. and H. Mosley. 2008. Revitalization Family Planning Programme in Indonesia. BKKBN Jakarta, Indonesia.
- Islam, M.M. and M. Rashid. 2004. Determinants of Unintended Pregnancy Among Ever-married Women in Bangladesh. *Journal of Family Welfare* 50(2): 40-47.

- Jain, A. 1999. Should eliminating unmet need for contraception continue to be a programme priority? *International Family Planning Perspectives* 25(Suppl.): S39-43, S49.
- Jensen, E. and D.A. Ahlburg. 2002. Family Size, Unwantedness, and Child Health and Health Care Utilization in Indonesia. *Bulletin of Indonesian Economic Studies* 38(1): 43-59.
- Joyce, T J and M. Grossman. 1990. Pregnancy wantedness and the early initiation of prenatal care. *Demography* 27(1): 1-17.
- Kost, K. and J.D. Forrest. 1995. Intention status of US births in 1988: Differences by mother's socio demographic characteristics. *Family Planning Perspectives* 27(1): 11-17.
- Kost, K., D.J. Landry, and J.E. Darroch. 1998. Predicting maternal behaviours during pregnancy: Does intention status matter? *Family Planning Perspectives* 30(2):79-88.
- Mensch, B.S., M. Arends-Keuning, A. Jain, and M.R. Garate. 1997. Avoiding unintended pregnancy in Peru. Does the quality of family planning services matter? *International Family Planning Perspectives* 23(1): 21-27.
- Microsoft Corporation. 2000. *Excel 2000*.
- Okonofua, F., O. Clifford, A. Halen, H.D. Patrick, and J. Agnes. 1999. Assessing the prevalence and determinants of unwanted pregnancy and induced abortion in Nigeria. *Studies in Family Planning* 30(1): 67-77.
- Okonofua, F., C. Odimegwu, B. Aina, P. Daru, and A. Johnson. 1996. *Women's experiences of unwanted pregnancy and induced abortion in Nigeria*. Summary report. Critical Issues in Reproductive Health Series. New York: The Population Council.
- Palomo, L. 2008. Determinants of Unintended Pregnancy: Results from a Re-analysis of the Philippines' 2003 NDHS. *Asia Pacific Social Science Review* 8(2): 99-116.
- Rosenberg, M., M. Waugh, and S. Long. 1995. Unintended pregnancies and use, misuse, and discontinuation of oral contraceptives. *Journal of Reproductive Medicine* 40:355-60.

- Santeli, J., R. Roger, H. Kendra, C.G. Brenda, C. Kathryn, C. Rebecca, S.H. Jennifer, and S. Laura. 2003. The measurement and meaning of unintended pregnancy. *Perspective on Sexual and Reproductive Health* 35(2): 94-101.
- Shaheen, A.A., M. Diaaeldin, M. Chaaya, and Z. El Roueiheb. 2007. Unintended pregnancy in Egypt: evidence from the national study on women giving birth in 1999. *Eastern Mediteranian Health Journal* 13(6):1392-1404.
- SPSS. 2006. SPSS for Windows Release 14. Chicago, Illinois: SPSS Inc.
- Stable, M.R., J.W. Stockbaver, W.F. Schramm, and G.H. Lard. 1990. Differentiating the barriers to adequate prenatal care in Missouri, 1987-1988. *Public Health Report* 105(6): 549-55.
- Sulak, P.J. and A.F. Haney. 1993. Unwanted pregnancies: Understanding contraceptive use and benefits in adolescents and older women. *American Journal of Obstetrics Gynecology* 168(6): 2042-8.
- Tarn, L. 1991. Intermediate and underlying factors associated with infant mortality in Peru (1984-1986) Proceedings of the Demographic and Health Surveys World Conference, Washington D.C.: Macro International, II: 1783-1806.
- Tsui, A.O., J.N. Wasserheit, and J. Haaga. 1997. *Reproductive Health in Developing Countries: Expanding dimensions, building solutions*. Washington D.C.: National Academy Press.
- Westoff, C F and N.B. Ryder. 1977. The predictive validity of reproductive intentions. *Demography* 14(4): 431-53.
- Westoff, C.F. 1981. Unwanted fertility in six developing countries. *International Family Planning Perspectives* 7(2): 43-52.
- Westoff, C.F., and A. Bankole. 1995. Unmet need 1990-1994. DHS Comparative Studies No.16. Calverton, Md: Macro International Inc.
- Williams, L. 1991. Determinants of unwanted childbearing among ever married women in the United States 1973-1988. *Family Planning Perspectives* 23(5): 212-21.