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CORRELATES OF SPONTANEOUS AND INDUCED ABORTION IN INDIA: AN INVESTIGATION USING A NATIONWIDE LARGE SCALE SURVEY DATA

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Abstract. *Using a large scale nationwide survey data (District Level Household Survey-3, 2007-08), this paper portrays the scenario of spontaneous and induced abortion in India also, it explores the key factors associated with spontaneous and induced abortion in India and some selected states with high rates of abortions. Bivariate and multivariate analysis are used to find out the determinants of abortion. Findings reveal that number of living sons, presence of RTIs, women's age, message about prevention of sex selection and contraceptive use are the significant determinants of induced abortion. Women's age at marriage, educational attainment, age at first birth and death of children are strong determinants of spontaneous abortion. The paper suggests that the government should implement programmes to address the early diagnosis and prompt treatment of cases that report to have RTI symptoms and focused emphasis should be on postpartum contraception.*

Keywords: Induced abortion, spontaneous abortion, RTIs, contraceptive use, India.

1. INTRODUCTION

Abortion is the termination of pregnancy before its full term. Spontaneous abortion is pregnancy resulting in miscarriages without the application of any deliberate methods to terminate it during the early weeks after conception. Induced abortion on the other hand is often done using several dangerous procedures under sub-standard clinical and unsanitary conditions. Women's access to safe abortion services is essential to safeguard

their health and is one of the important components of Reproductive and Child Health Programmes. Arrangement of safe and legal abortion is important for women's survival and reproductive health, particularly in view of the fact that abortion is one of the leading causes of maternal mortality and morbidity. The magnitude of spontaneous abortion and induced abortion whether legal or illegal has become an era of serious concern in developing countries. In developing countries, the risk of death following complications of unsafe abortion procedures is several hundred times higher than that of an abortion performed professionally under safe conditions (WHO, 1998).

Abortion was liberalized in India after the 1971 Medical Termination of Pregnancy (MTP) Act came into effect on 1 April 1972, according to which a pregnancy may be terminated within 20 weeks of gestation. Before 1972, abortion was permitted only if it was necessary to save the life of the woman. Now it is also allowed on the grounds of preserving her mental or physical health, as well as in case of pregnancy due to rape, incest or contraceptive failure. However it is illegal if it is performed just because a woman (or some other persons) requests it or if it is sought only for social and/or economic reasons (United Nations, 1993). The initiative taken by the Government of India to liberalize abortion was path breaking in that it recognized that an unwanted pregnancy could cause serious mental anguish to a woman and, therefore, she should have the right to abortion.

The MTP Act, however, included several restrictions which have proved counterproductive in making abortion services widely and easily accessible to women. Only doctors who have received training in MTP can perform abortion procedures and they cannot be performed in any place other than a clinic or a hospital established, or maintained by the government or an institution approved by the government for this purpose. Being a sensitive issue, a large number of women are not aware that abortion is legal and many have moral or other objections to pregnancy termination. In such circumstances, most of these women if they had to go for abortion, they would prefer sources which are not public and go to private clinics where privacy and confidentiality are better maintained (CORT, 1995).

The Indian government has also repeatedly emphasized that medical termination of pregnancy (MTP) should not be viewed as a method of family planning or of reducing the national birth rate. In India the incidence of abortion is always under reported, perhaps because of the guilt or the moral stigma associated with it. Some studies estimate the extent of under-reporting to be about 50 per cent (Tiwari, 1994). A study conducted by Chhabra and Nuna (1994), reveals that because of illegal abortions, 15,000-20,000

abortion-related deaths occur in India every year, mainly among married women. In recent years, induced abortion has attained high public concern because of the alarming high levels of maternal mortality (254 per 100,000 live births in India) and morbidity due to unsafe abortion. It is observed that after the introduction of the MTP, reported MTP cases have been on increase.

In India, every year approximately 5-6 million abortions are conducted by private practitioners illegally. Majority of these cases are done in rural areas having inadequate facilities and done in an unhygienic and unscientific way. These illegal abortions carried out by uncertified village practitioners are a major determinant of continued high levels of maternal mortality and morbidity. According to the Consortium on National Consensus for Medical Abortion in India (2008), every year an average of about 11 million abortions take place annually and around 20,000 women die every year due to abortion related complications. Most abortion-related maternal deaths are attributable to illegal abortions. Hence, there is a need to identify the important factors responsible for induced and spontaneous abortion in across the major states of India where induced and spontaneous abortion is high.

Therefore, in general the study aims to investigate the level, patterns, differentials and factors of spontaneous and induced abortion in India. Specifically, the study objectives are to depict the current scenario of spontaneous and induced abortion in India and its major states; to determine the factors associated with spontaneous abortion in India and some selected states; to examine out the factors associated with induced abortion in India and the selected states.

2. LITERATURE REVIEW

The proposed conceptual frameworks show the socio-economic and bio-demographic determinants which are strongly associated with induced and spontaneous abortions. The factors named age of the women, age at marriage, age at first birth, caste, educational qualification, working status, number of living sons, number of living daughters, children died before, contraceptive use, reproductive tract infections, heard or seen message - prevention of sex selection mutually controls each other. Besides controlling each other, the predictors would have strong bearing on induced abortion as well as on spontaneous abortion (Figure 1 and Figure 2).

Figure 1
CONCEPTUAL FRAMEWORK SHOWING THE LINKAGES BETWEEN THE INTERMEDIATE FACTORS AND INDUCED ABORTION

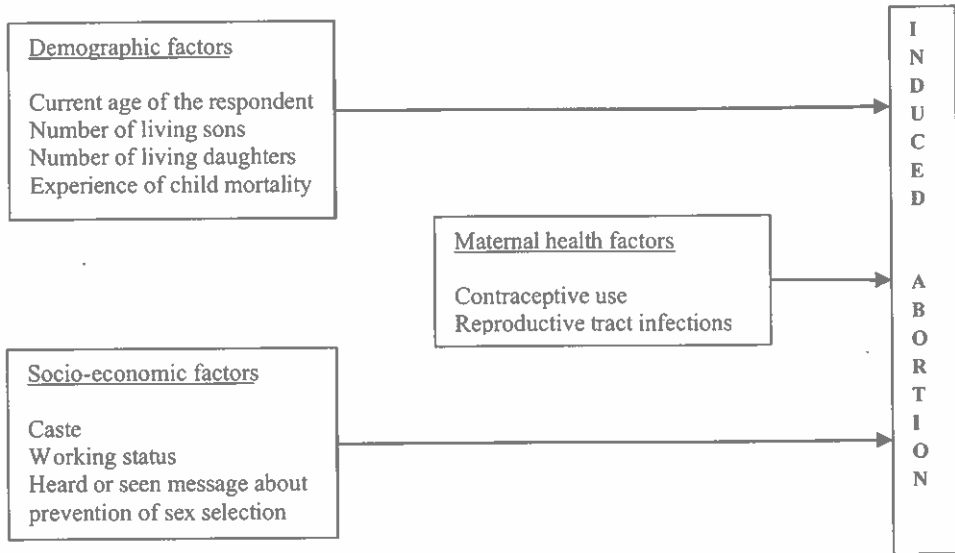
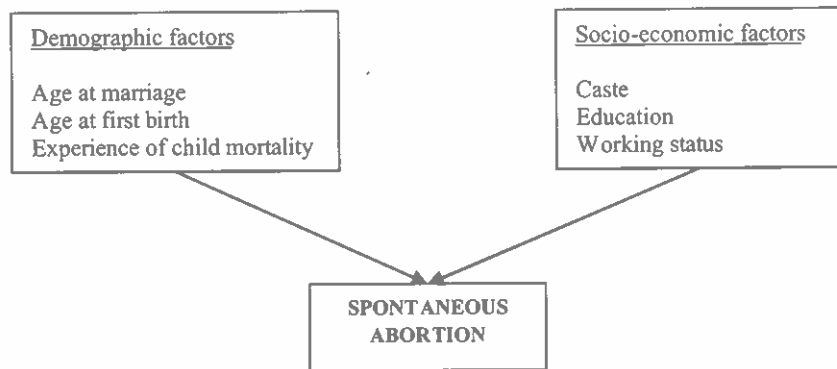


Figure 2
CONCEPTUAL FRAMEWORK SHOWING THE LINKAGES BETWEEN THE INTERMEDIATE FACTORS AND SPONTANEOUS ABORTION



According to a study conducted by Shah and Ahman (2004) in Asian, African and Latin American regions, for developing regions as a whole, two-thirds of unsafe abortions occur among women aged 15-30 and fourteen per cent among women under age 20. In Asia thirty per cent of unsafe abortions are in women under age 25 and sixty per cent in women under age 30. The age pattern of unsafe abortions differs markedly between regions. However, almost sixty per cent of unsafe abortions in Africa are among women under age 25 and almost eighty per cent are among women under 30. In Latin America and the Caribbean women aged 20-29 account for more than half of unsafe abortions.

A study based on National Family Health Survey (1992-93) data reveals that in India abortion seekers had given birth to more of children than those who have not yet sought abortion and women who are working in the family farm are less engaged in induced abortion, while those who were self-employed or employed by someone else reported the highest rates of abortion (Das et al., 2000). Khan et al. (1990) and Chhabra et al. (1988) in their study found that the proportion of illiterate women among abortion seekers is low compared to the literates.

A large proportion of abortions are now cited as falling under a special category that was almost non-existent at the time of the framing of the MTP Act. This category is sex determination followed by abortion of the female foetus. In such cases it is not the pregnancy but its outcome that is unwanted. The first sex selective abortion was documented in India in the 1970s, with the advent of amniocentesis and it immediately began to be used in genetic clinics for determining the sex of the foetus, with the sole purpose of circumventing the birth of girls (Oomman and Ganatra, 2002). A study by Kumari (2006) shows that the sex of the child is an important determinant of induced abortion as the abortion rate is higher if the woman has two daughters or one son and one daughter.

Some studies conclude that son preference is an important factor influencing the practice of abortion (Park and Cho, 1995; Miller, 2001; Van Balen and Inhorn, 2003), and that son preferring women who do not want daughter tend to terminate their pregnancies through induced abortion. In a strong son preferring society, if a woman of reproductive age has a strong son preference, she may seek to become pregnant until she achieves her desired number of sons (Wen, 1992; Haughton and Haughton, 1996; Arnold, 1997; Clark, 1999). When she has enough sons, she may use induced abortion to stop having more children (Park and Cho, 1995; Miller, 2001; Wong and Ho, 2001; Van Balen and Inhorn, 2003).

According to Nagaraj (2002), fertility decline in Tamil Nadu has been achieved by bunching births around shorter birth intervals, with a high proportion of pregnancies-at-risk and high level of pregnancy wastage. Nonetheless, in the view of Ganatra et al. (1999), ICMR (1989) and Khan et al. (1990), abortion is used either for limiting family size or for spacing children in a large number of cases. In a community based study by Malhotra et al. (2003) focused in Madhya Pradesh it was found that more than half of the abortions among urban women took place in a public sector facility and the remaining resorting to folk methods or self-induction. In mid-1990's, over a quarter of a century after abortion became legal, a study by Ganatra et al. (2002), showed that despite having had an induced abortion in the recent past, 25.2 per cent of the women believed abortion was illegal while 12 per cent were unsure of its legal status.

In recent decades contraception and induced abortion have been widely used as a means for women to achieve their desired number of children and for birth timing (Bankole et al., 1999). In their study Ganatra et al. (1999) and Gupta et al. (1997) have mentioned that public abortion services are generally not accepted because of their insistence on contraceptive use immediately after abortion. A study conducted by Visaria et al. (2007), reveals that overall, private facilities are considered to be much better than those run by the government, and women cite a wide range of reasons to justify their use of them. This suggests that women and their families do weigh the alternatives before deciding where to go.

Johnson et al. (2004), interviewed over 500 people from 145 institutions in 25 cities, towns and villages in Romania, about the range of actions needed to prevent unwanted pregnancies, reduce abortion-related morbidity and mortality and improve the quality accessibility and availability of abortion and contraceptive services. They observed that although much progress has been made in contraceptive services over the past ten years, improvements in abortion care have lagged considerably. Ganatra and Hirve (2002) interviewed 197 adolescent women and found that most of them have performed abortion in private sector and pacing was the main reason for them to seek abortion because use of contraception was low among them.

In India the law requires a medical practitioner's authorization for an abortion. In addition, the public health services sometimes ask women for their husband's signature of consent, even though it is not stipulated in law. In Punjab, the High Court allowed a man to divorce his wife on grounds of cruelty because she has had two abortions against his wishes, which implies acceptance of husband consent (IIPS, 2003). When women go to a hospital for

abortion, they are often asked to get the signature of the husband as an indicator of the latter's consent. This has become a troublesome issue in the context of women's reproductive rights.

According to the research conducted by Gupta et al. (1997) and Khan et al. (1996), the husband's consent is demanded despite the fact that it is not a legal requirement. Studies of induced abortion among women in rural western Maharashtra indicate that over two thirds reported post abortion problems that were severe enough to affect their daily household routines. However, evidence from China indicates that women who reported having an induced abortion in a rural facility were significantly more likely to have a diagnosed reproductive tract infection compared to women who reported no abortion or they obtained services at a higher-level health facility (IIPS, 2003). Studies indicate that at least one in five women who have an unsafe abortion suffer a reproductive tract infection as a result and some of these serious infections lead to infertility (WHO, 1998).

3. DATA AND METHODS

This study used unit level data from District level Household Survey-III (2007-08). The District Level Household and Facility Survey is one of the largest ever demographic and health surveys carried out in India, with a sample size of about 700,000 households covering all districts of the country. The Ministry of Health and Family Welfare (MoHFW), Government of India, initiated District Level Household and Facility Survey (DLHS) in 1997 to provide district level estimates on health indicators to assist policy makers and program administrators in decentralized planning, monitoring and evaluation. The present District Level Household and Facility Survey is third in the series preceded by DLHS-I in 1998-99 and DLHS-II in 2002-04. DLHS-III is designed to provide estimates on maternal and child health, family planning and other reproductive health services.

In this survey, 1,156,932 ever married women were interviewed. The ever-married women's questionnaire contained information on women's characteristics, maternal care, immunization and childcare, contraception and fertility preferences, reproductive health including knowledge about HIV/AIDS. According to the data out of 1,156,932 ever married women aged 15-49 interviewed in India 37,192 and 117,373 experienced induced and spontaneous abortion respectively. The response variables in the study are spontaneous abortion and induced abortion. Based on the literature review, bio-demographic and socio-economic variables, which are available with the

dataset have been chosen and used for analysis. The descriptions of the covariates used in this study are provided in Table 1.

Table 1
DESCRIPTION AND CLASSIFICATION OF VARIABLES USED IN THE ANALYSIS

Variables	Response categories	Description of variables
Induced abortion	0= No 1= Yes	At the time of survey respondent was asked about experience of induced abortion
Spontaneous abortion	0= No 1= Yes	At the time of survey respondent was asked about experience of spontaneous abortion
Age	1= 15-24 2= 25-34 3= 35 and above	Age of the women at the time of survey
Age at marriage	Continuous variable	Age of the women at the time of marriage
Age at first birth	1= 10-17 2= 18-30 3= 31-49	Age of the women at the time of first birth
Women's education	0= Illiterate 1= Primary 2= Secondary 3= Higher	Educational qualification of the women at the time of the survey
Caste of the women	1= Scheduled castes 2= Scheduled tribes 3= Others	Caste of the women at the time of survey
Working status	0= Working 1= Not working	Working status of the women at the time of survey
Number of living sons	Continuous variable	Number of living sons of the women
Number of living daughters	Continuous variable	Number of living daughters of the women
Children died	0= No 1= Yes	Death of any children of the women

Continued

Continued Table 1

Variables	Response categories	Description of variables
Heard or seen message-prevention of sex selection	0= No 1= Yes	At the time of survey respondent was asked whether she has heard or seen message-prevention of sex selection
Contraceptive use	0= No 1= Yes	At the time of survey respondent was asked about contraceptive use
Reproductive tract infections	0= No 1= Yes	At the time of survey respondent was asked whether she has reproductive tract infections

Simple univariate and bivariate analysis has been used to show the current abortion scenario and the possible linkages with selected characteristics of women with the abortion. Multivariate regression analysis further explores the direction and intensity of association. The analysis has been done for India as a whole and for eleven Indian States viz. Orissa, Assam, Uttar Pradesh, Bihar, Maharashtra, Tamil Nadu, West Bengal, Punjab, Kerala, Karnataka and Tamil Nadu which notes a high abortion rates.

Binary logistic regression has been utilized for the dependent variables i.e. induced abortion and spontaneous abortion since they are coded in binary form. Logistic regression model is commonly estimated by maximum likelihood function. For the outcome variable, the logistic model takes the following general form.

$$\text{logit}(p) = \ln(p/1-p) = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + \dots + b_ix_i + e$$

In case of induced abortion the logistic model is

$$\ln(p/1-p) = b_0 + b_1 \text{ number of living sons} + b_2 \text{ number of living daughters} + b_3 \text{ reproductive tract infections} + b_4 \text{ working status} + b_5 \text{ children died} + b_6 \text{ heard/seen message about prevention of sex selection} + b_7 \text{ caste} + b_8 \text{ contraceptive use} + e$$

The logistic model for spontaneous abortion is

$$\ln(p/1-p) = b_0 + b_1 \text{ age at marriage} + b_2 \text{ education} + b_3 \text{ age at first birth} + b_4 \text{ working status} + b_5 \text{ caste} + b_6 \text{ children died} + e$$

b_1 , b_2 , b_3 and b_k represent the coefficients of each of the predictor variables included in the model, while ϵ is the error term. $\ln(p/1-p)$ represents the natural logarithm of the odds of the outcome. The regression analysis yields odds ratios which indicates magnitude of the predictor variable on the probability of the outcome occurring. The odds ratios in this analysis are the measure of the odds of occurrence of induced or spontaneous abortions by the independent variables. As regards to the direction of the logit coefficients, odds greater than one indicate an increased probability of incidence of induced or spontaneous abortions; while those less than one indicate a decreased probability.

4. RESULTS

The findings reveal that the occurrence of spontaneous and induced abortion in India is 10 per cent and three per cent respectively. As shown in Figure 3 and Figure 4, in the major states like Uttar Pradesh, Bihar, Orissa, Karnataka, Kerala and Tamil Nadu the percentage of spontaneous abortion ranges from 10-15. The percentage of induced abortion in Punjab, Maharashtra, Kerala, Tamil Nadu, Uttar Pradesh, Orissa, West Bengal and Assam ranges from three to eight.

The results from bivariate analysis are described in the following figures which depict the scenario of induced and spontaneous abortion in India and its major states according to the socio-economic and demographic factors. It is observed from Figure 5 that occurrence of both induced and spontaneous abortion in urban areas is high than in rural areas in India and its eight states. The percentage of induced abortion is high in urban areas and this may be because of the availability of medical facility and the possible reason for highest spontaneous abortion in urban areas may be the work pressure among the working women. However, it is to be noticed that the incidence of spontaneous abortion in both the rural and urban areas of Uttar Pradesh (15.3 per cent and 15.9 per cent respectively) and Kerala (15.5 per cent and 15.6 per cent) is high compared to the other states while Uttar Pradesh comes under BIMARU (under developed) states and Kerala is a developed state. Son preference is very high in Uttar Pradesh and in rural areas women are not getting proper health facility which results high rate of induced and spontaneous abortion. Subsequently, incidence of induced abortion in the urban and rural areas of eight states is lower than the national average.

As can be seen from Figure 6 in India and the major states like Uttar Pradesh, West Bengal, Maharashtra, Tamil Nadu and Punjab occurrence of induced abortion in private clinics is more than in the government institutions.

Out of all induced abortions conducted in India, more than 60 per cent are conducted in private clinics. The plausible reason may be that most of these abortions conducted in these clinics are illegal (Times of India, 2012). In West Bengal, Maharashtra, Punjab and Uttar Pradesh more than 70 per cent induced abortions are conducted in private clinics. However, except in Assam, Orissa and Kerala, the percentage of induced abortions conducted in private clinics is higher than the national average.

Figure 3
PERCENTAGE OF SPONTANEOUS ABORTION: INDIA AND ITS STATE, DLHS-III (2007-08)

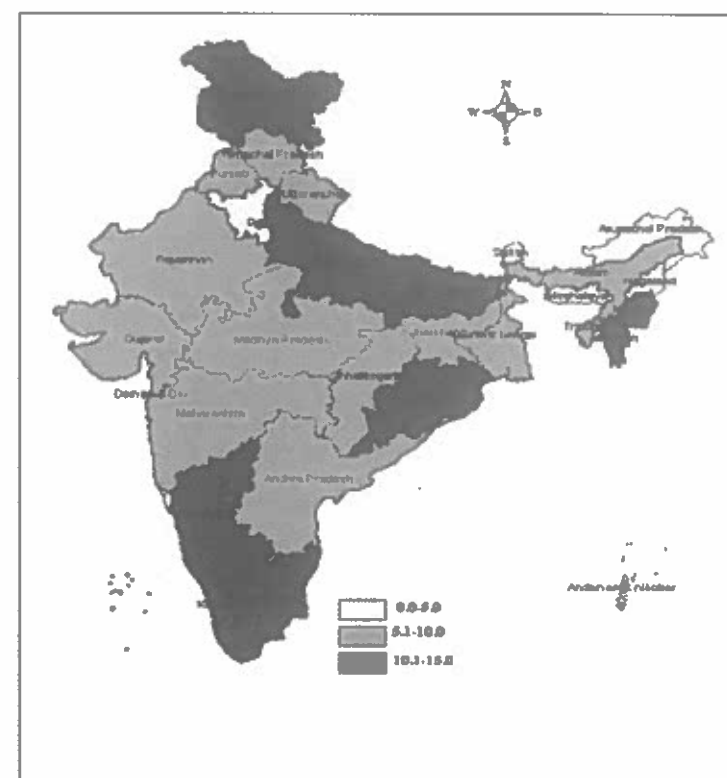


Figure 4
PERCENTAGE OF INDUCED ABORTION: INDIA AND ITS STATES, DLHS-III (2007-2008)

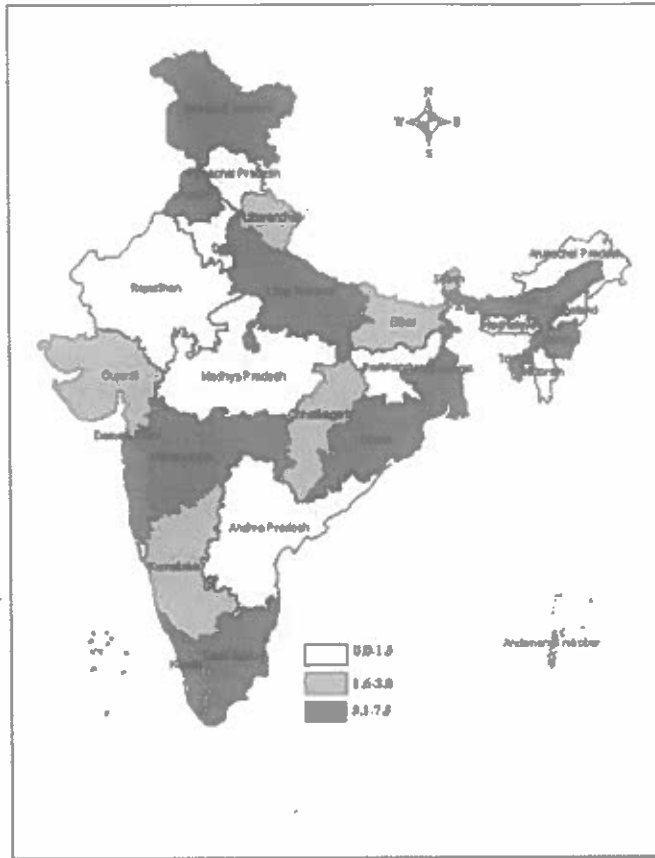


Figure 5
PERCENTAGE OF INDUCED AND SPONTANEOUS ABORTION CONDUCTED BY PLACE OF RESIDENCE: INDIA AND SOME SELECTED STATES, DLHS-3 (2007-2008)

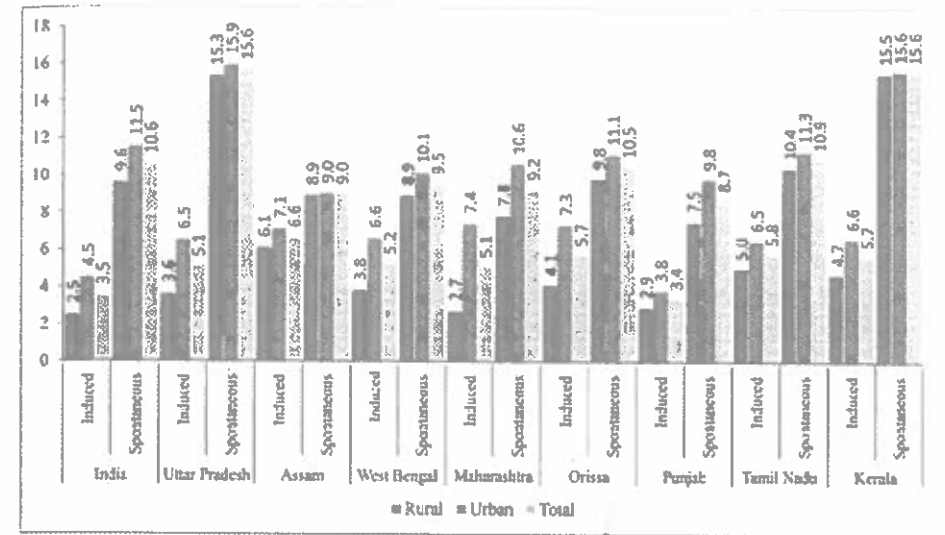
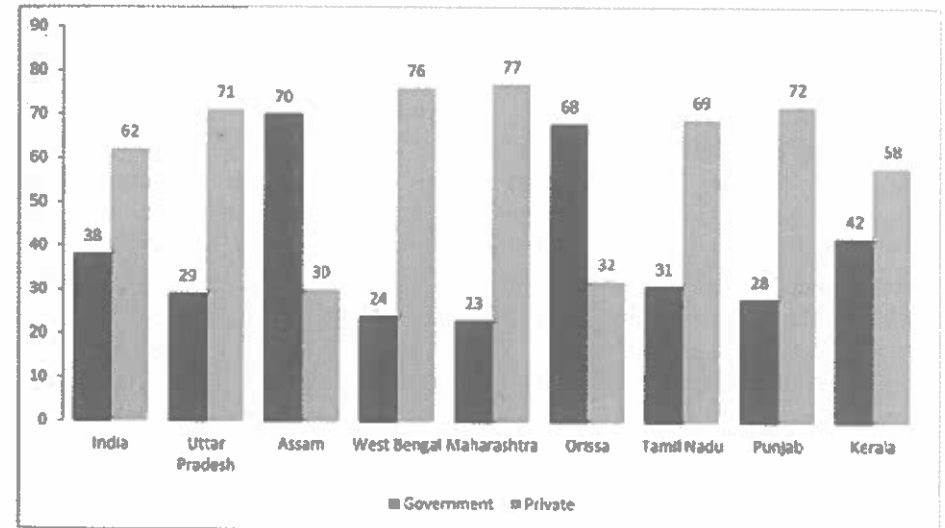
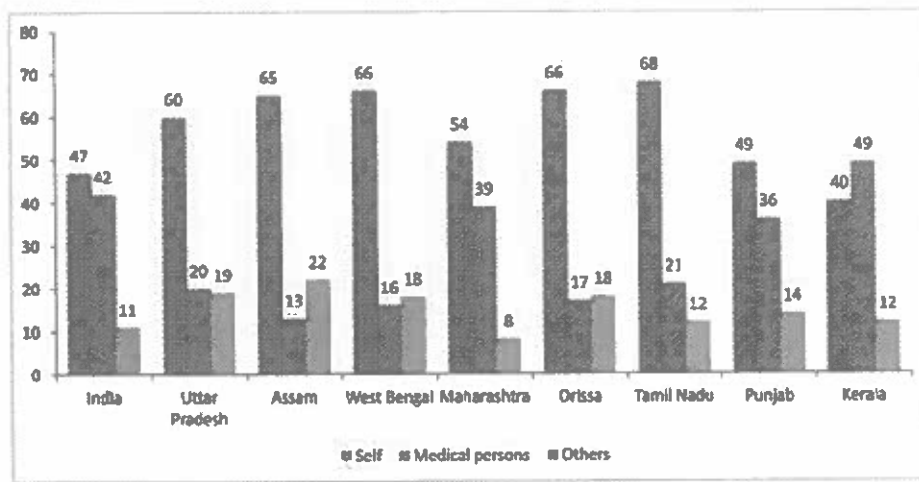


Figure 6
PERCENTAGE OF INDUCED ABORTION CONDUCTED BY PLACE: INDIA AND SOME SELECTED STATES, DLHS-3 (2007-2008)



Subsequently, in India and all the major states the majority of women took the decision of their own for induced abortion except in Kerala (Figure 7). Kerala is the only state where the majority of induced abortion was advised by medical persons. In Uttar Pradesh, Assam, West Bengal, Orissa, Tamil Nadu and Punjab the occurrence of induced abortions advised by medical persons is lower as compared to the national average.

Figure 7
PERCENTAGE OF INDUCED ABORTION CONDUCTED BY THE ADVICE OF DIFFERENT PERSONS: INDIA AND SOME SELECTED STATES, DLHS-3 (2007-2008)



The occurrence of induced abortion is higher among the richest women and lower among poorest in India (Figure 8). The reason may be the richest can afford induced abortions in private clinics whereas the poorest cannot. In all the eight states, namely Uttar Pradesh, Assam, West Bengal, Maharashtra, Orissa, Punjab, Tamil Nadu and Kerala, the percentage of induced abortion increases with the increase in standard of living. The incidence of induced abortion is highest among the richest. Maharashtra and Orissa are the two states where the percentage of induced abortion among the richest women is higher (8.8 per cent) compared to the other states.

The incidence of induced abortion is higher among non-working women as compared to working women in India (Figure 9). However, in Punjab, Tamil Nadu and West Bengal the incidence of induced abortion among working women is higher. It might be due to the fact that most of the women in these states are engaged in agricultural sectors. The percentage of induced abortion among non-working women in Uttar Pradesh, Assam,

Maharashtra, Orissa and Kerala is higher compared to the percentage of induced abortion among working women and higher than the national average. In Assam and Maharashtra percentage of induced abortion among the non-working women is the same (6.3 per cent) and highest compared to the other states.

Figure 8
PERCENTAGE OF INDUCED ABORTION CONDUCTED BY WEALTH QUINTILES: INDIA AND SOME SELECTED STATES, DLHS-3 (2007-2008)

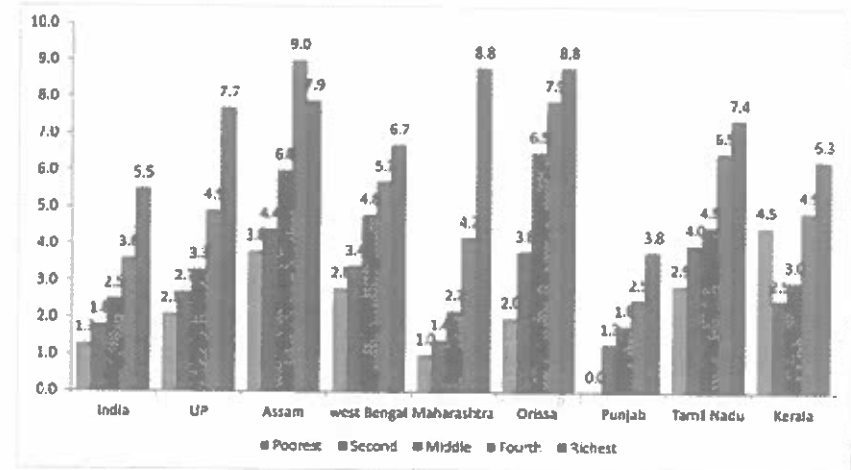
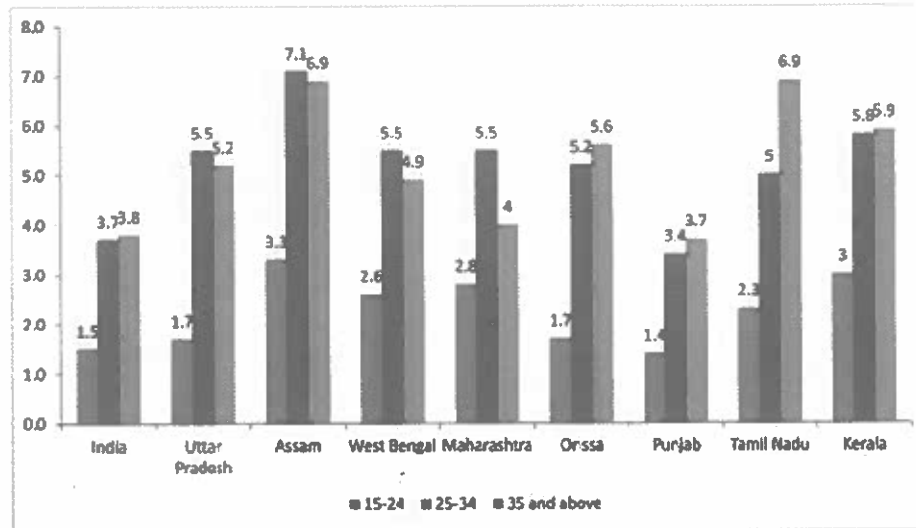


Figure 9
PERCENTAGE OF INDUCED ABORTION CONDUCTED BY WORKING STATUS OF THE WOMEN: INDIA AND SOME SELECTED STATES, DLHS-3 (2007-08)



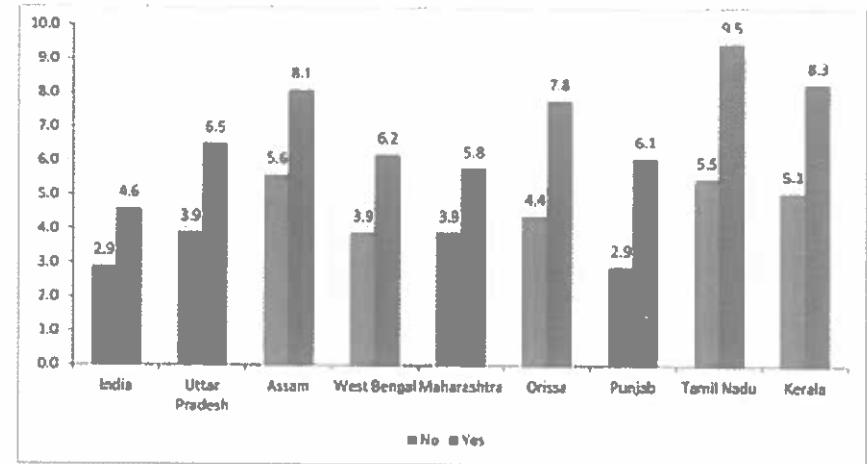
The percentage change in the incidence of induced abortion with the change in women's age in India and its major states where the rates of induced abortion is high is presented in Figure 10. It can be seen that in India and all its major states the percentage of induced abortion is lower among the women aged 15-24 while the incidence is found to be significantly higher among the age group 25-34 and 35 and above. Uttar Pradesh, Assam, West Bengal and Maharashtra are the states where the percentage of occurrence is higher among the women aged 25-34, while in Orissa, Punjab and Tamil Nadu the percentage is higher among the women aged 35 and above. The plausible explanation of increase in the percentage of induced abortion among the women aged 25-34 and 35 and above may be the unwanted pregnancy.

Figure 10
PERCENTAGE OF INDUCED ABORTION CONDUCTED BY AGE OF THE WOMEN: INDIA AND SOME SELECTED STATES, DLHS-3 (2007-2008)



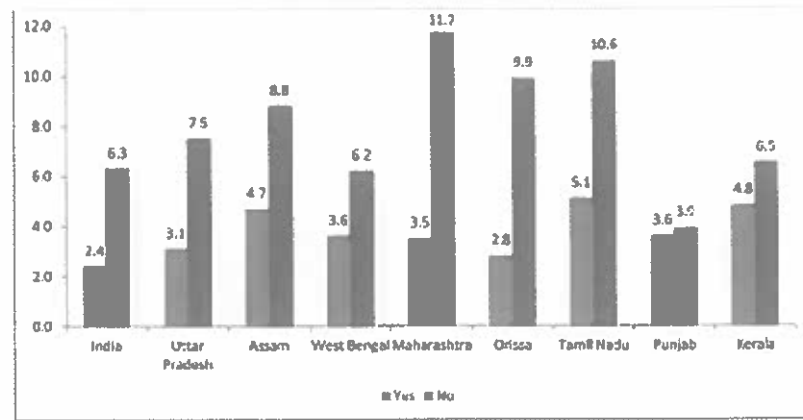
In India including all the major states, the occurrence of induced abortion among the women who are affected by reproductive tract infections (RTIs) is almost two times higher than the occurrence of induced abortion among those who are not affected by RTIs (Figure 11). In states like Maharashtra, Orissa, Punjab, Tamil Nadu and Kerala, the incidence of induced abortion among the women with RTIs is higher than the national average. Consequently, Tamil Nadu has the highest percentage of induced abortion (9.5 per cent) among the women with RTIs followed by Kerala, Assam and Orissa.

Figure 11
PERCENTAGE OF INDUCED ABORTION CONDUCTED BY REPRODUCTIVE TRACT INFECTIONS: INDIA AND SOME SELECTED STATES, DLHS-3 (2007-2008)



It can be seen from Figure 12 that in India the incidence of induced abortion is substantially two times higher among those who themselves or their husbands do not use contraceptives than the incidence of induced abortion among those who use contraceptives. Among the states, in Orissa reporting of induced abortion is very low (2.8 per cent) among the contraceptive users. In Maharashtra the incidence of induced abortion among non-users is highest compared to other states and the occurrence among non-users (11.7 per cent) is more than three times higher than among users of contraception (3.5 per cent). However, in Tamil Nadu, Orissa, Assam and Uttar Pradesh the occurrence of induced abortion is also high among non-users of contraception. This may be because of sex selective abortions which indicate a strong son preference in these states.

Figure 12
PERCENTAGE OF INDUCED ABORTION CONDUCTED BY CONTRACEPTIVE USE: INDIA AND SOME SELECTED STATES, DLHS-3 (2007-2008)



It is evident that among the scheduled castes and scheduled tribes the incidence of induced abortion is very low as compared to other castes (Figure 13). The plausible reason may be scheduled castes and scheduled tribes do not prefer abortion as they believe that children are the gift of God (Nagda, 2003). The scenario in all the states is the same as in the country, except Assam and Punjab. In these two states the incidence of induced abortion is higher among scheduled tribes.

Figure 13
PERCENTAGE OF INDUCED ABORTION CONDUCTED BY CASTE: INDIA AND SOME SELECTED STATES, DLHS-3 (2007-2008)

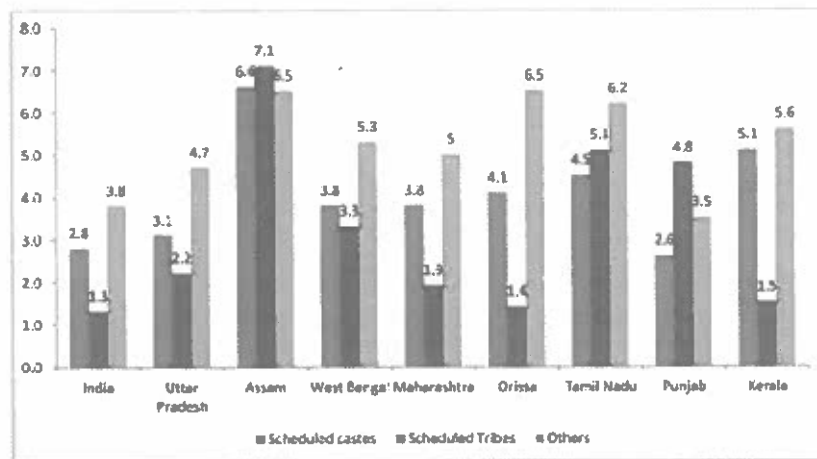
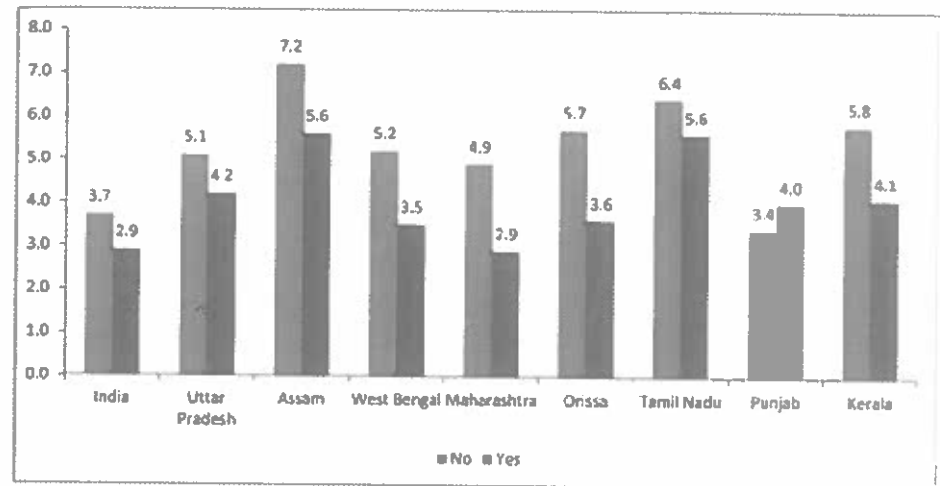


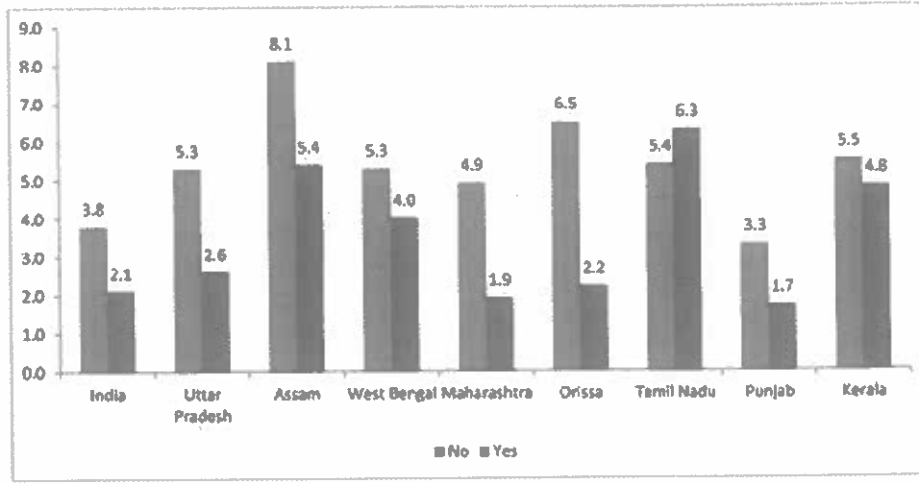
Figure 14 reveals the scenario of induced abortion between those who experience child mortality and those who do not experience child mortality. It is observed that in India and almost all the states the incidence of induced abortion is higher among those who do not experience child mortality than among those who experience child mortality. It may be because of higher unwanted pregnancy among women who do not experience child mortality.

Figure 14
PERCENTAGE OF INDUCED ABORTION CONDUCTED AMONG THOSE WHO EXPERIENCE CHILD MORTALITY: INDIA AND SOME SELECTED STATES, DLHS-3 (2007-2008)



In India the occurrence of induced abortion among women who have heard or seen message about prevention of sex selection is about two times lower (2.1 per cent) than the occurrence of induced abortion among women who have not heard or seen message about prevention of sex selection. In Maharashtra, Orissa and Punjab the incidence is very low (1.9 per cent, 2.2 per cent and 1.7 per cent respectively) among those who have heard or seen the message.

Figure 15
PERCENTAGE OF INDUCED ABORTION CONDUCTED AMONG THOSE WHO HAVE HEARD OR SEEN MESSAGE ABOUT PREVENTION OF SEX SELECTION: INDIA AND SOME SELECTED STATES, DLHS-3 (2007-2008)



The scenario of spontaneous abortion by socio-economic and demographic factors in India and the states where spontaneous abortion is high is presented in Table 2. In India and its states spontaneous abortion is higher among educated women than among the uneducated. It is found that in India and its states out of all the spontaneous abortion, most of the abortions occur among those whose age at first birth is 31-49 years. This may be because of the complications during the pregnancy in late ages. However, spontaneous abortion is higher among the working women as compared to non-working women. It might be due to the fact that in India most of the women are engaged in agricultural sector. In Uttar Pradesh among the working women the occurrence of spontaneous abortion is highest (17 per cent), followed by Kerala (16 per cent). In India and all selected states the incidence of spontaneous abortion is substantially higher among those women who experience child mortality.

Table 2
PERCENTAGE OF SPONTANEOUS ABORTION BY SOCIO-ECONOMIC AND DEMOGRAPHIC FACTORS: INDIA AND SOME SELECTED STATES, DLHS-3 (2007-2008)

	Uttar Pradesh	Haryana	Bihar	Karnataka	Tamil Nadu	Kerala	Orissa	India	n
Women's education									
No education	24.6	11.5	15.2	45.5	11	10.0	15.8	16.3	1,831
Primary	16.1	14.5	12.6	12.4	11.9	15.6	12.3	10.5	180,961
Secondary	14.2	27.194	11.9	16,748	11.8	20,985	12,308	10.4	330,481
Higher	13.0	14,037	11.0	6,085	9.7	9,219	7,332	10.4	135,247
Total	14.6	60,451	12.1	30,813	11.3	42,173	22,006	10.4	648,520
Age at first birth									
10-17	16.4	29,412	14.3	15,483	10.2	7,958	16.2	10.0	211,825
18-30	16.2	102,683	12.5	30,734	10.4	41,995	18,478	10.5	810,771
31-49	21.9	572	12.1	468	15.1	794	534	14.8	9,543
Total	16.3	132,667	12.5	46,685	10.5	50,747	20,631	10.4	1,032,139
Working status									
Not working	14.5	89,270	11.2	22,920	10.1	31,031	17,476	10.3	30,562
Working	17.0	58,464	12.7	29,042	11.8	25,156	5,204	9.6	14,664
Total	15.5	147,734	11.9	51,962	10.9	56,187	22,680	10.1	45,226
Caste									
Scheduled castes	16.1	27,051	11.0	9,092	10.7	13,507	2,031	10.5	8,891
Scheduled tribes	12.7	1,987	11.0	4,529	7.3	879	403	6.7	187,140
Others	15.3	118,284	12.1	37,840	11.0	41,698	20,194	11.0	24,139
Total	15.4	147,322	11.9	51,461	10.9	56,084	22,628	10.4	44,961
Experience of child mortality									
No	15.1	85,852	12.1	37,482	10.3	44,494	19,469	10.1	29,804
Yes	18.4	46,806	13.3	9,205	11.9	6,265	1,162	10.7	10,631
Total	16.3	132,658	12.5	46,687	10.5	50,759	20,631	10.2	40,435

The findings from the logistic regression analysis reveal some important socio-economic and demographic factors which are responsible for induced and spontaneous abortion in India and the states where the abortion rates are high (Table 3). In general, in India the probability of conducting induced abortion is significantly and statistically affected by the women's caste and whether a woman experiences RTI, works, experiences child mortality, ever hears or sees message-prevention of sex selection and uses contraception. In addition, the age at marriage, women's education, age at first birth, working status, caste and experience of child mortality have statistically significant influence on the odds of spontaneous abortion.

Women who suffer from reproductive tract infections (RTIs) are 1.68 times more likely to abort their children than their counterparts. Working women are 0.83 times less likely to experience induced abortion than non-working women. Women who experience child mortality are 0.79 times less likely to conduct induced abortion than women who have no child mortality. As women's age is increasing the incidence of abortion is also increasing among the women. The probability of induced abortion among women aged 35 and above is 2.88 times higher than the odds of induced abortion among women aged 15-24 years. Women who have heard/seen message about prevention of sex selection are 0.71 times less likely to prefer induced abortion than women who have not heard or seen message about prevention of sex selection. Other castes have highest likelihood of induced abortion: 1.20 times more likely than the odds of induced abortion among scheduled caste. The probability of induced abortion is 0.47 times lower among women who use contraception than among women who do not use contraception.

Across the states, it can be seen that in Orissa the working women are 21 per cent, in Uttar Pradesh 15 per cent, in Maharashtra 32 per cent are less likely than the non-working women to experience induced abortion. This could be due to the fact that working women may be more aware about the complications of abortion. In almost all the eight states the odds ratio of induced abortion is lower among women whose children died possibly because the desire for more children is high among them.

The age of women has a positive association with induced abortion. It is evident that message about prevention of sex selection is an important factor which is negatively associated with induced abortion in all the states. The increasing awareness of prevention of sex selection causes the occurrence of induced abortion is decreasing in all the eight states. In Orissa, scheduled tribes are 51 per cent less likely to experience induced abortion than

scheduled castes at one per cent level of significance. Similarly, scheduled tribes of West Bengal and Tamil Nadu are respectively 35 and 62 per cent less likely to uphold induced abortion than scheduled castes whereas the likelihood of induced abortion among other castes is higher compared to scheduled castes in Orissa, Uttar Pradesh, Punjab and Kerala. The reason may be the other caste women are the deprived groups with low standard of living and if they desire also they cannot go to the clinics for abortion. According to Gupta et al. (1997), if the abortion is not legal within the frame of the MTP Act then women have to pay more and these abortions have to take place in private sectors.

Contraceptive use plays a significant role in discouraging induced abortion. In Orissa the odds of induced abortion is decreased by 58 per cent among the contraceptive users than the nonusers. In Assam the likelihood of induced abortion is 41 per cent higher among the women who use contraceptive methods compared to those who do not use.

Table 3
THE ODDS RATIOS OF INDUCED ABORTION BY BACKGROUND CHARACTERISTICS: INDIA AND SELECTED STATES,
DLHS-3 (2007-2008)

Background characteristics	India								
	Orissa	Assam	Uttar Pradesh	Maharashtra	West Bengal	Tamil Nadu	Punjab	Kerala	India
Number of living sons	1.231***	0.989	1.032*	0.900*	1.142*	1.293***	1.106	0.992	1.012
Number of living daughters	1.021	0.996	0.995	0.974	0.973	1.089***	1.044	0.997	0.983
RTI									
No	1.620***	1.580***	1.701***	1.473***	1.668***	1.720***	2.153***	2.134***	1.680***
Yes									
Working status									
Not working	0.789**	0.939	0.849***	0.684***	1.227**	1.113	1.179	0.913	0.831***
Working									
Experience of child mortality									
No	0.713***	0.793*	0.809***	0.701**	0.608***	0.766*	1.238	0.794	0.786***
Yes									
Age									
15-24	2.081***	1.506***	2.344***	2.207***	1.886***	2.265***	1.860**	2.212***	2.210***
25-34	2.884***	1.484***	2.446***	2.353***	2.397***	3.309***	2.436***	2.586***	2.880***
35 and above									
Heard/seen message-prevention of sex selection									
No	0.524***	0.657***	0.616***	0.577***	0.918	1.334**	0.378**	0.735	0.705***
Yes									
Caste									
Scheduled castes	0.494***	1.152	0.644	0.817	0.646**	0.381**	1.086	0.351	0.562***
Scheduled tribes	1.189*	0.925	1.343***	1.146	0.998	0.967	1.411**	1.330	1.196***
Others									
Contraceptive use									
No	0.423***	0.588***	0.508***	0.420***	0.649***	0.480***	1.029	0.789*	0.470***
Yes									

Note: * Significant at $p < 0.10$; ** significant at $p < 0.05$; *** significant at $p < 0.01$.

Regarding the predictors of spontaneous abortion, it is observed from Table 4 that in India as the age at marriage increasing the incidence of spontaneous abortion is decreasing. It may be due to the fact that at lower age women are not physically prepared to bear the child and hence are more likely to experience spontaneous abortion. Working women are more prone towards spontaneous abortion than non-working women. The plausible explanation is that in India women are more engaged in agricultural sectors and due to excess physical labour they have higher chance to experience miscarriage. Women whose age at first birth is 31-49 are more vulnerable for spontaneous abortion than those whose age at first birth is younger because at older ages women face higher risks of pregnancy complications.

The likelihood of spontaneous abortion is higher among women with no education. It might be due to the lack of knowledge of preventing abortion among this group of women. As in the case of induced abortion, other caste women have highest odds of spontaneous abortion. Women who experience child mortality have higher likelihood of spontaneous abortion than women who do not experience child mortality.

In Uttar Pradesh, Bihar, Haryana, Karnataka, Kerala, Tamil Nadu and Orissa the age at marriage is negatively associated with spontaneous abortion. Education is found to play a substantial role in reducing spontaneous abortion in all the states. In all the selected states educational qualification of women and spontaneous abortion are inversely and significantly related. With the increase in the age at first birth an increase in spontaneous abortion is observed in all the seven states. In Uttar Pradesh, Bihar, Tamil Nadu and Orissa working women are more likely to practice spontaneous abortion than non-working women.

Table 4
THE ODDS RATIOS OF SPONTANEOUS ABORTION BY BACKGROUND CHARACTERISTICS: INDIA AND SELECTED STATES, DLHS-3 (2007-2008)

Background characteristics	Uttar Pradesh		Bihar	Karnataka	Haryana	Kerala	Tamil Nadu	Orissa	India
Age at marriage	0.981**		0.986	0.992	0.956***	0.995	0.972	0.991	0.981***
Women's Education									
No education	0.594**		0.827	0.198*	1.431	0.909	21.072	0.840	0.610***
Primary	0.521***		0.763	0.200*	1.603	0.957	22.852	0.761	0.608***
Secondary	0.473***		0.710*	0.216*	1.453	0.829	19.854	0.672	0.576***
Higher									
Age at first birth									
10-17	1.134**		1.153**	1.192**	1.279**	1.053	1.153*	1.130	1.165***
18-30	2.052***		1.283	2.036**	1.889	1.794*	2.452***	2.190*	2.156***
31-49									
Working status									
Not working	1.185***		1.193**	1.057	1.045	1.000	1.253***	1.269***	1.116***
Working									
Caste									
Scheduled castes	0.581**		1.325	1.019	1.675	0.736	0.986	0.687***	0.701***
Scheduled tribes	1.068		1.146	1.020	0.902	1.070	1.058	0.944	1.076***
Others									
Experience of child mortality									
No	1.269***		1.198**	1.225*	1.240**	1.230*	1.139*	1.238**	1.356***
Yes									

Note: * Significant at p < 0.10; ** significant at p < 0.05; *** significant at p < 0.01.

5. CONCLUSIONS AND RECOMMENDATIONS

The study shows that in Orissa, Assam Uttar Pradesh, Maharashtra, West Bengal, Tamil Nadu and Kerala where the percentage of induced abortion is high, number of living sons, reproductive tract infections, women's age, message about prevention of sex selection and contraceptive use are the major determinants of induced abortion. However, women aged 25-49 years are in the greatest need of interventions to prevent unsafe abortion. Government should implement programmes to address the early diagnosis and prompt treatment of cases that report to have RTI symptoms and to strengthen health care delivery system and sensitize health care professional about issues and needs of RTI patients.

Also, policy makers should emphasize intervention strategies to develop awareness among the population about the complications of induced abortion. Therefore, emphasis must be given on family planning programmes in a focused manner to reduce the incidence of illegal abortion. Again, the government can prevent all deaths and complications arising from unsafe abortion by providing simple and safe procedures and techniques for early induced abortion. Thus, people should be taught about the dangers of unsafe abortion, the importance of family planning for prevention of unwanted pregnancy, and the availability of elective abortion as followed by Law. Women's age at marriage, women's educational qualification, age at first birth and death of children are the strong determinants of spontaneous abortion in all the states where the percentage of spontaneous abortion is high. The government should strengthen the programme pertaining to enhance education and health care utilization so that the chance of spontaneous abortion will be reduced in these states.

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FAMILY INCOME, SAVING AND POTENTIAL DEMAND FOR MICROINSURANCE POLICY IN THE GREATER JAKARTA AREA (JABODETABEK)

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Abstract. *The gap between microinsurance supply and demand mechanism has impeded the prosperity improvement for low income people in informal sectors in Indonesia. From the supply side, which is driven by insurance companies, there is an urgency to find the best scheme, both technically and professionally. On the other hand, from the demand side, the willingness and purchase ability of urban people for risk protection by having insurance products should be improved. This is an exploratory study, aiming to evaluate and measure the gap between supply and demand mechanism for microinsurance products (focused on life insurance and its derivatives), detects the factors related to the gap and problems in income, and how government interventions can solve these problems. Multivariate and qualitative analysis (FGD and IDI) were employed and stratified clustered sampling technique was used in the study.*

Keywords: Social security provision, microinsurance, insurance industry, government regulation, Indonesia.

1. INTRODUCTION

Statistics Indonesia (BPS, 2010) reported that 13,3% of Indonesia population living under the poverty and being exposed to high life risk due to natural disaster, low standard of hygiene practices, and also low standard of work safety. The life risk of the poor population becomes much