Correlates of Spontaneous and Induced Abortion in India: An Investigation using a Nationwide Large Scale Survey Data

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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 Programme. 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 performed just because a woman (or some other person) 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 women 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. Doctors who have received training in MTP can only perform abortion procedures and it 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. Thus abortion being a sensitive issue, a large number of women are not aware of its being legal and also do not approve it. 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 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 percent (Tiwari, 1994). A study conducted by Chhabra and Nuna (1994), reveals that because of illegal abortions, 15000-20000 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 and morbidity due to unsafe abortion. It is observed that after the introduction of the Medical Termination of Pregnancy, 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 untrained 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 India and its major states where induced and spontaneous abortion is high.

The proposed conceptual frameworks show that the socio-economic and bio-demographic factors namely 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

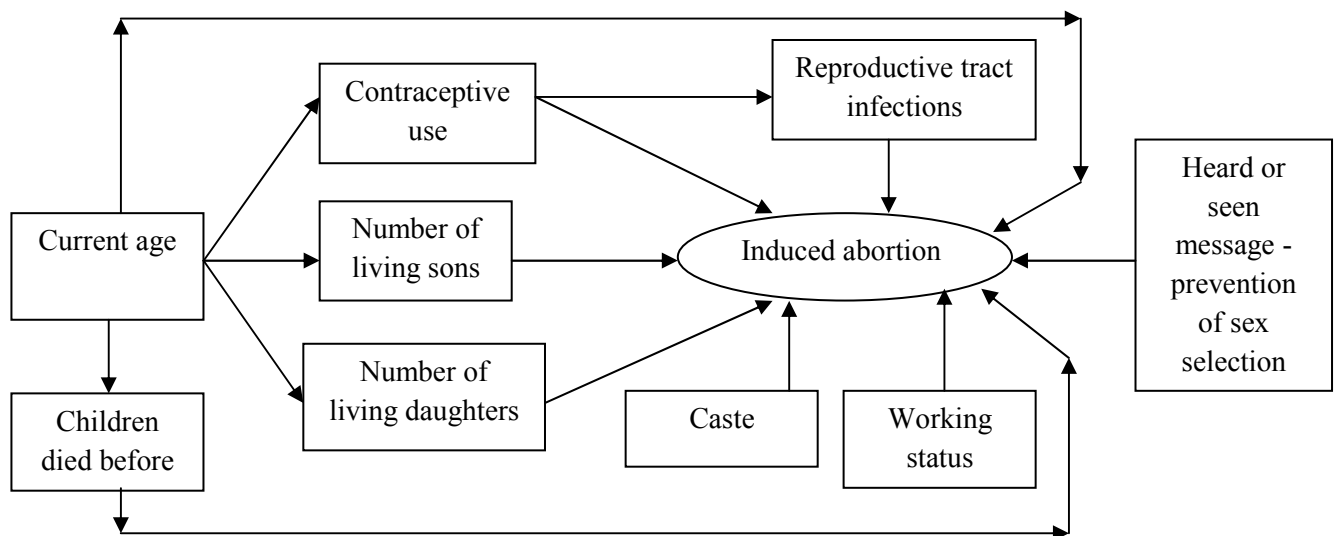*Conceptual frameworks showing the linkages between the intermediate factors and Induced abortion*
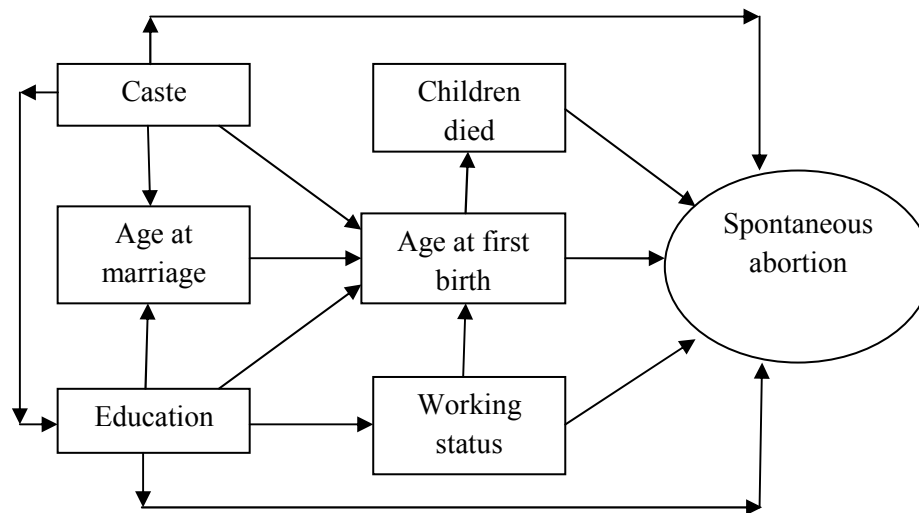
Figure 2

Conceptual frameworks showing the linkages between the intermediate factors and Induced 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 percent among women under age 20. In Asia thirty percent of unsafe abortions are in women under age 25 and sixty percent in women under age 30. The age pattern of unsafe abortions differs markedly between regions. However, almost sixty percent of unsafe abortions in Africa are among women under age 25 and almost eighty percent are among women under 30 In Latin America and the Caribbean women aged 20-29 account for more than half of unsafe abortions with almost in women under 30. A study based on National Family health Survey (1992-93) data reveals that abortion seekers had given birth to more number of children compared to 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, Desai and Patel, 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 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 amnio-centesis 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 (Ooman and Ganatra, 2002). A study by Kumari (2006), portrays that the sex of the child is an important factor for induced abortion as the abortion rate is high with two children or having one son and one daughter.

Some studies conclude that son preference is an important factor influencing the practice of abortion (Park & Cho, 1995; Miller, 2001; Van Balen & 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, 1996; Arnold, 1997; Clark, 2000). When she has enough sons, she may use induced abortion to stop having more children (Park & Cho, 1995; Miller, 2001; Wong & Ho, 2001; Van Balen & 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 view of Ganatra et.al. 1999; ICMR 1989 and Khan et al. 1990, in a large number of cases abortion is used either for limiting family size or for spacing children. In a community based study by Malhotra et al. (2003) in Madhya Pradesh focused 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. (2000), showed that despite having had an induced abortion in the recent past, 25.2 percent of the women believed abortion was illegal while 12 percent 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 Gupte 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, Ramachandran, Ganatra and Kalyanwala (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, Horga and Fajans (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 adolescents 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 Gupte 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 that 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).

Objectives

1. To depict the current scenario of spontaneous and induced abortion in India and its major states.
2. To determine the factors associated with spontaneous abortion in India and some selected states.
3. To find out the factors associated with induced abortion in India and the selected states.

Data and methods

Data:

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 seven lakh 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, 1156932 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 1156932 ever married women aged 15-49 interviewed in India 37192 and 117373 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 has 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 induced abortion
Spontaneous abortion	0= No 1= Yes	At the time of survey respondent was asked about 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
Heard or seen message-prevention of sex selection	0= No 1= Yes	At the time of survey women were asked whether they have heard or seen message-prevention of sex selection
Contraceptive use	0= No 1= Yes	At the time of survey women were asked about contraceptive use
Reproductive tract infections	0= No 1= Yes	At the time of survey women were asked whether they have reproductive tract infections

Methods:

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 and Kerala, Karnataka, Tamil Nadu which notes a high abortion rates.

Multivariate Regression Analysis

Binary logistic model:

This model 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:

Logit P = ln(P/1-P) = b0+b1x1+b2x2+b3x3+...............................+bixi+e,

Where, b1, b2, b3 and bi represent the coefficients of each of the predictor variables included in the model, while e is an error term. ln(P/1-P) represents the natural logarithm of the odds of the outcome. The regression analysis yields odds ratios which indicates the 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.

Results

The findings reveal that the occurrence of spontaneous and induced abortion in India is 10 percent and 3 percent respectively. As shown in the following figures, in the major states like Uttar Pradesh, Bihar, Orissa, Karnataka, Kerala and Tamil Nadu percentage of spontaneous abortion ranges from 10-15; and percentage of induced abortion in Punjab, Maharashtra, Kerala, Tamil Nadu, Uttar Pradesh, Orissa, West Bengal and Assam ranges from 3-8.

It is observed from Figure 5 that occurrence of both induced and spontaneous abortion in urban areas is high than the rural areas in the country and its eight states. However, it is to be noticed that the incidence of spontaneous abortion in both the rural and urban areas of Uttar Pradesh (15.3 percent and 15.9 percent respectively) and Kerala (15.5 percent and 15.6 percent) is high compared to the other states while Uttar Pradesh comes under BIMARU (under developed) states and Kerala is a developed state. Subsequently, incidence of induced abortion in the urban and rural areas of eight states is less than the national average. It is

Evident from Figure 6 that 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 the government institutions. However, except Kerala in all the above states, percentage of induced abortion conducted in private clinics is more than the national average.

Subsequently, Figure 7 depicts that in all the major states percentage of abortion advised by medical persons is very less. On the contrary, high percentage of women takes the decision of their own for induced abortion. In Uttar Pradesh, Assam, West Bengal, Orissa, Tamil Nadu and Punjab occurrence of induced abortions advised by medical persons is less as compared to the national average. However, Kerala is the only state where incidence of induced abortion advised by medical persons is high (49 percent) and more than the national average. Figure 8 portrays that In India and all eight states namely Uttar Pradesh, Assam, West Bengal, Maharashtra, Orissa, Punjab, Tamil Nadu and Kerala, percentage of induced abortion is increasing with the increase in standard of living. Women who are richest among them incidence of induced abortion is high. Maharashtra and Orissa are the two states where percentage of induced abortion among the richest women is high (8.8 percent) compared to the other states and the percentage is less among poor women than the others.

It is evident from Figure 9 that in Punjab, Tamil Nadu and West Bengal the incidence of induced abortion among working women is substantially high. However, percentage of induced abortion among non-working women in Uttar Pradesh, Assam, Maharashtra, Orissa and Kerala is high compared to working women and more than the national average. In Assam and Maharashtra percentage of induced abortion among the non-working women is same (6.3 percent) and highest compared to the other states. Figure 10 portrays 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. It is observed that in India and all its major states percentage of induced abortion is less among the women aged 15-24 while the incidence is found to be significantly high among the age group 25-34 and 35 and above. Uttar Pradesh, Assam, West Bengal and Maharashtra are the states where percentage of occurrence is more among the women aged 25-34; while in Orissa, Punjab and Tamil Nadu the percentage is high 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 11 reveals that in India including all the major sates, occurrence of induced abortion among the women who are affected by reproductive tract infections (RTIs) is almost two times higher than those who are not affected by RTIs. In all the states incidence of induced abortion among the women with RTIs is more than the national average. Consequently, Tamil Nadu has the highest percentage (9.5 percent) of induced abortion among the women with RTIs followed by Kerala, Assam and Orissa.
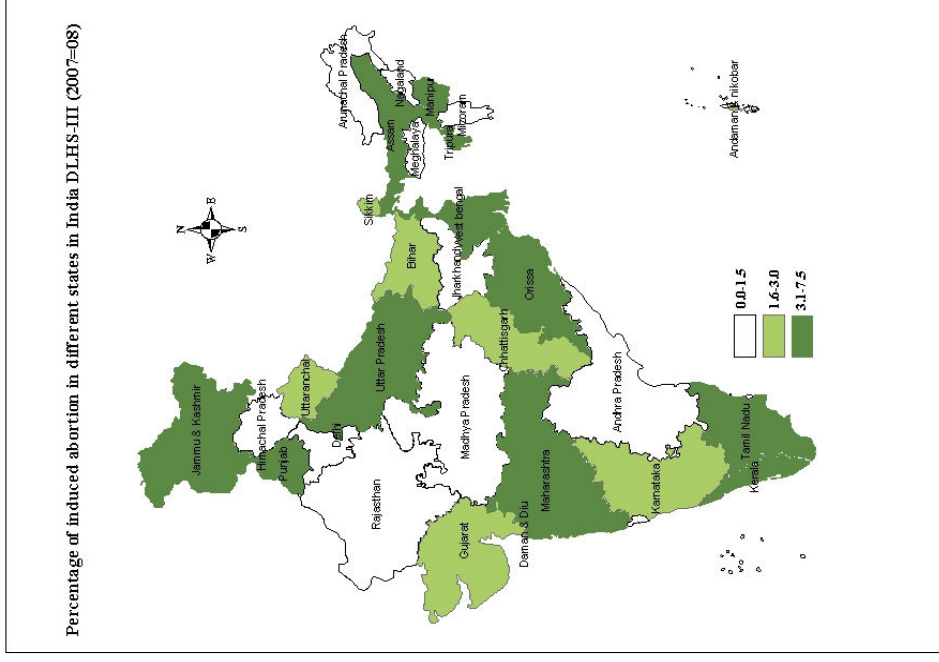
Figure 4

Percentage of induced abortion in different states in India DLHS-III (2007–08)

Figure 3

Percentage of spontaneous abortion in different states in India, DLHS-III (2007-08)
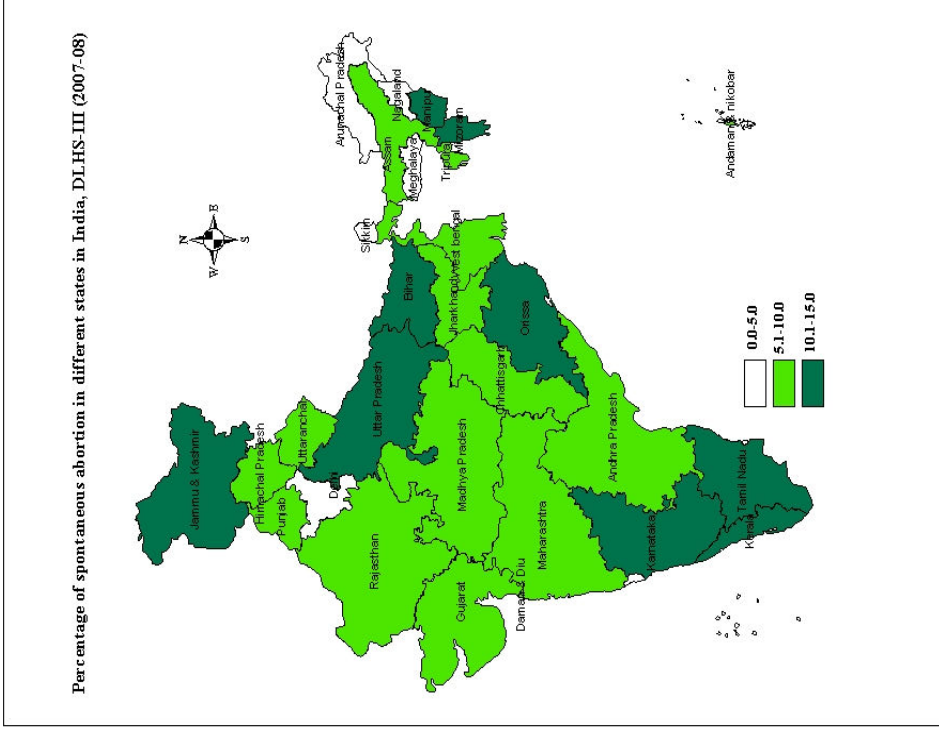
Figure 5: Percentage of induced abortion conducted by Place of residence in India and some selected stated, DLHS-3 (2007-08)
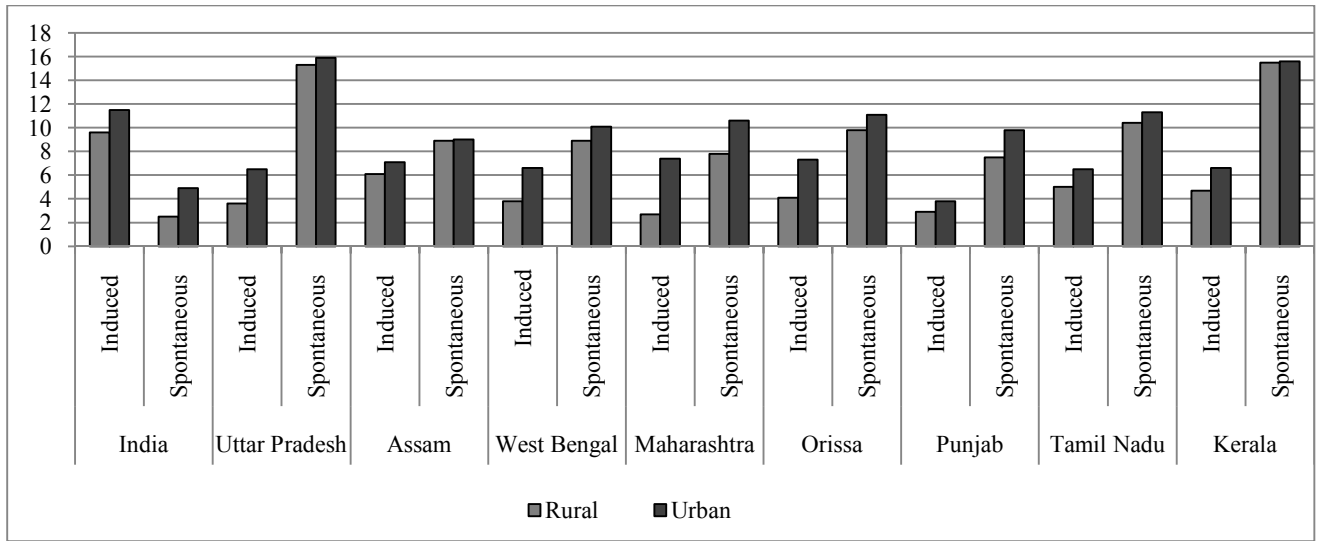

Figure 6: Percentage of induced abortion conducted by place in India and some selected stated, DLHS-3 (2007-08)
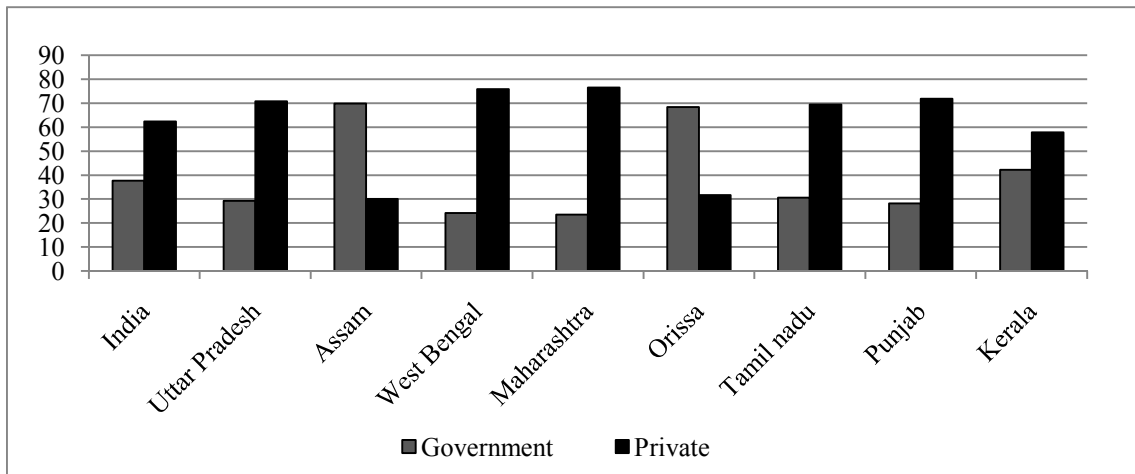

Figure 7: Percentage of induced abortion conducted by the advice of different persons in India and some selected stated, DLHS-3 (2007-08)
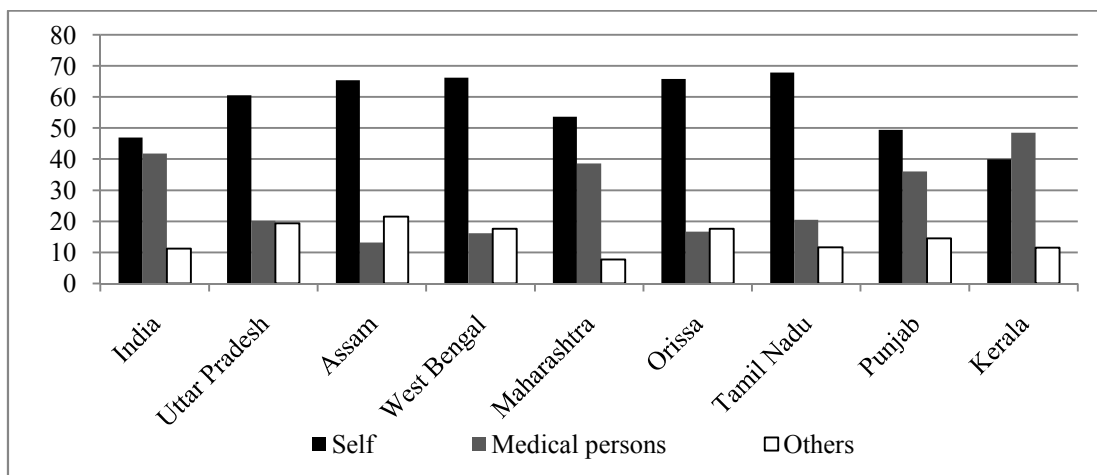
Figure 8: Percentage of induced abortion conducted by wealth quintiles in India and some selected stated, DLHS-3 (2007-08)
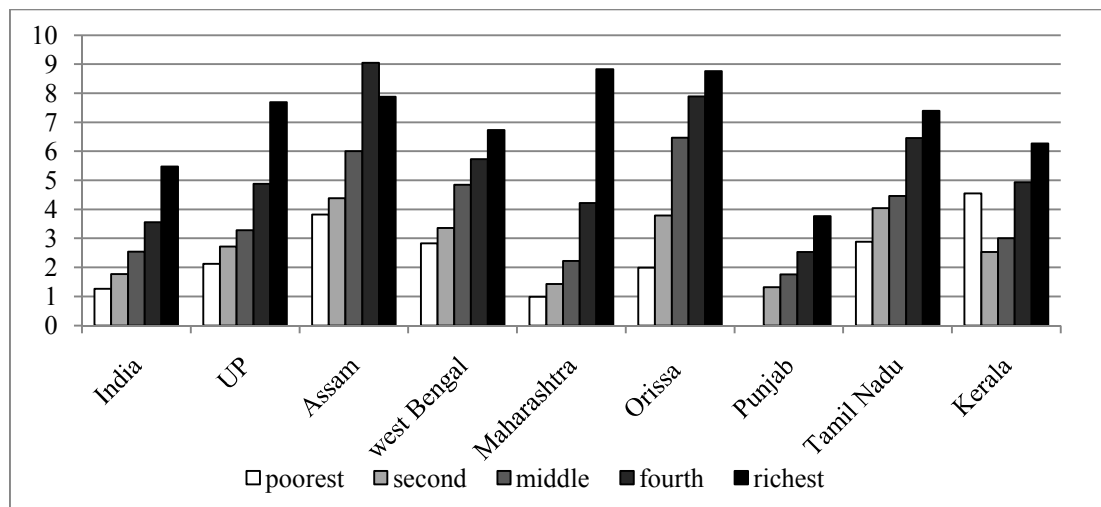

Figure 9: Percentage of induced abortion conducted by working status of the women in India and some selected stated, DLHS-3 (2007-08)
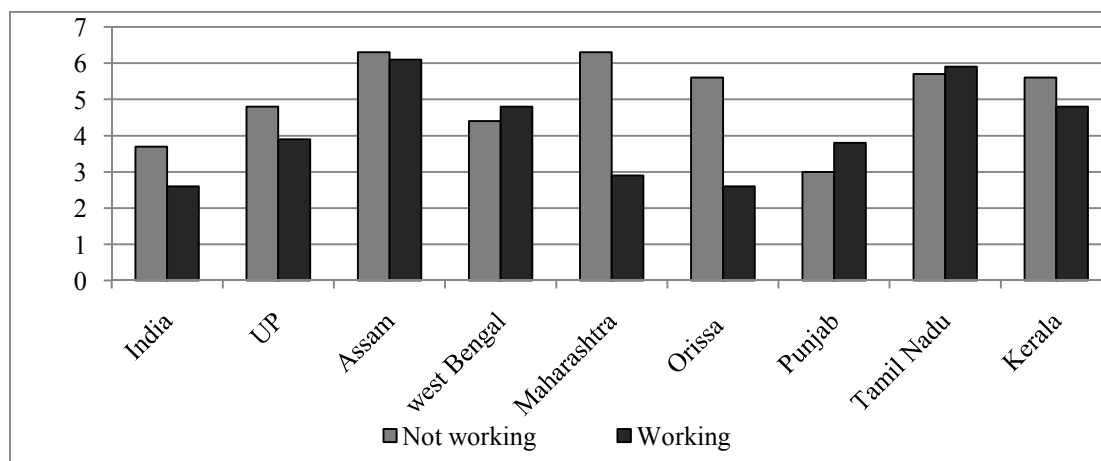

Figure 10: Percentage of induced abortion conducted by age of the women in India and some selected stated, DLHS-3 (2007-08)
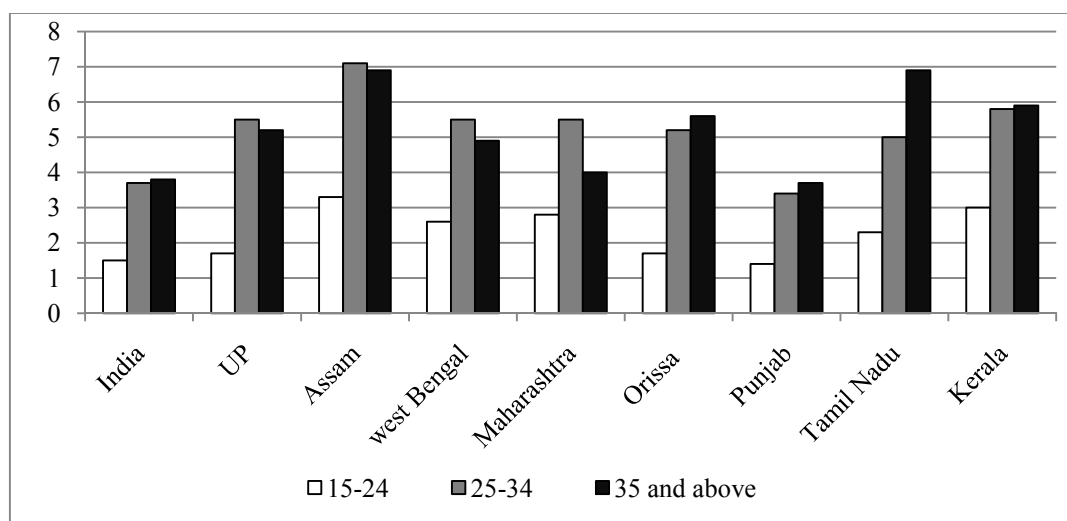
Figure 11: Percentage of induced abortion conducted by reproductive tract infections in India and some selected stated, DLHS-3 (2007-08)
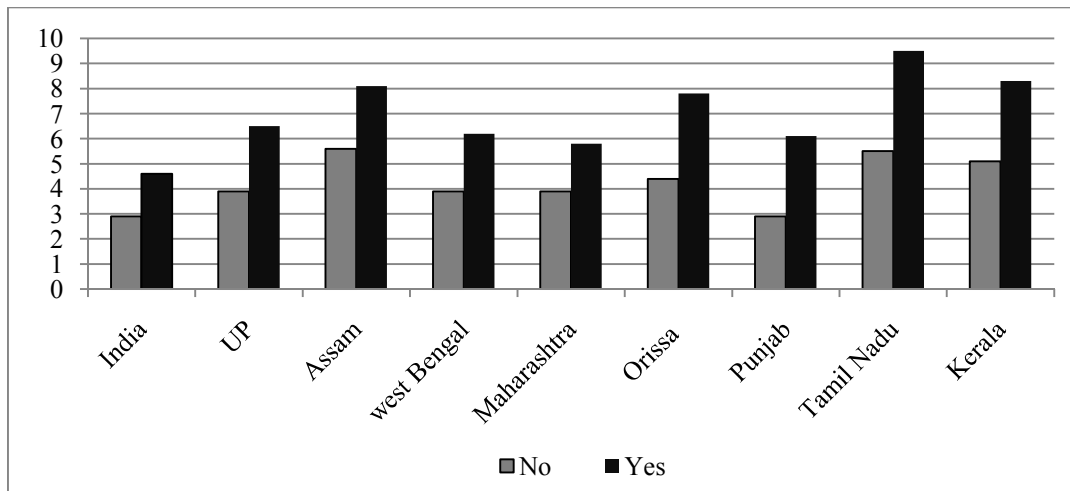

Table 2 portrays that In India and all the eight states women who were suffering from reproductive tract infections (RTIs) are more likely to abort their children than their counterparts. In Orissa the working women are 21 percent, in Uttar Pradesh 15 percent, in Maharashtra 32 percent and in India 17 percent less likely to experience induced abortion than the non working women. 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 and India, the odds ratio of induced abortion is less among the women whose children are died because the desire of children among them is high. Age of the women has a positive association with induced abortion and is statistically significant at 1 percent level of significance. It is evident that message about prevention of sex selection is an important factor which is negatively associated with induced abortion. With increasing awareness of prevention of sex selection the occurrence of induced abortion is decreasing in all the eight states and India. In Orissa, scheduled tribes are 51 percent less likely to experience induced abortion than scheduled castes at one percent level of significance. Similarly, Scheduled tribes of West Bengal and Tamil Nadu are 35 and 62 percent less likely to uphold induced abortion than scheduled castes, where as the likelihood of induced abortion among other castes is more compares to scheduled castes in Orissa, Uttar Pradesh, Punjab and Kerala. The reason may be the scheduled tribes 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 Act, then women have to pay more and these abortions are 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 percent among the contraceptive users than the non users (p<0.01). In Assam the likelihood of induced abortion is 41 percent more among the women who use contraceptive methods compared to those who do not use (p<0.01).

Regarding the predictors of spontaneous abortion, it is observed from Table 3 that in Uttar Pradesh, Bihar, Haryana, Karnataka, Kerala, Tamil Nadu and Orissa age at marriage is negatively associated with spontaneous abortion. It may be due to the fact that at low age women are not physically prepared to bear the child. Education is found to play a substantial role in reducing spontaneous abortion. 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 observe in all the seven states. Women whose age at first birth is 31-49 are more vulnerable for spontaneous abortion than those whose age at first birth is less, because at higher ages women face pregnancy complications. In Uttar Pradesh, Bihar, Tamil Nadu and Orissa the working women are more likely to practice spontaneous abortion than non-working women and the plausible explanation is that in these states women are more engaged in agricultural sectors and due to excess physical labour they experience miscarriage.

Conclusion

The study shows that in Orissa, Assam Uttar Pradesh, Maharashtra, West Bengal, Tamil Nadu and Kerala where 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. Secondly, 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 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 percentage of spontaneous abortion is high. Government should strengthen the programme pertaining to enhance education and health care utilization so that the chance of spontaneous abortion will reduce in these states.

Table 2: The odds ratios of induced abortion by background characteristics in India and selected states, DLHS-3 (2007-08)

Background characteristics	Orissa	Assam	U P	Maharashtra	WB	TN	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									
Yes	1.620***	1.580***	1.701***	1.473***	1.668***	1.720***	2.153***	2.134***	1.680***
Working status									
Not working									
Working	0.789**	0.939	0.849***	0.684***	1.227**	1.113	1.179	0.913	0.831***
Children died									
No									
Yes	0.713***	0.793*	0.809***	0.701**	0.608***	0.766*	1.238	0.794	0.786***
Age									
15-24									
25-34	2.081***	1.506***	2.344***	2.207***	1.886***	2.265***	1.860**	2.212***	2.210***
35 and above	2.884***	1.484***	2.446***	2.353***	2.397***	3.309***	2.436***	2.586***	2.880***
Heard/seen message-prevention of sex selection	0.524***	0.657***	0.616***	0.577***	0.918	1.334**	0.378**	0.735	0.705***
Caste									
Scheduled castes									
Scheduled tribes	0.494***	1.152	0.644	0.817	0.646**	0.381**	1.086	0.351	0.562***
Others	1.189*	0.925	1.343***	1.146	0.998	0.967	1.411**	1.330	1.196***
Contraceptive use									
No									
Yes	0.423***	0.588***	0.508***	0.420***	0.649***	0.480***	1.029	0.789*	0.470***

Note: * (p<0.10), ** (p<0.05), *** (p<0.01)

Table 3: The odds ratios of spontaneous abortion by background characteristics in India and selected states, DLHS-3 (2007-08)

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								
Primary	0.594**	0.827	0.198*	1.431	0.909	21.072	0.840	0.610***
Secondary	0.521***	0.763	0.200*	1.603	0.957	22.852	0.761	0.608***
Higher	0.473***	0.710*	0.216*	1.453	0.829	19.854	0.672	0.576***
Age at first birth								
10-17								
18-30	1.134**	1.153**	1.192**	1.279**	1.053	1.153*	1.130	1.165***
31-49	2.052***	1.283	2.036**	1.889	1.794*	2.452***	2.190*	2.156***
Working status								
Not working								
Working	1.185***	1.193**	1.057	1.045	1.000	1.253***	1.269***	1.116***
Caste								
Scheduled castes								
Scheduled tribes	0.581**	1.325	1.019	1.675	0.736	0.986	0.687***	0.701***
Others	1.068	1.146	1.020	0.902	1.070	1.058	0.944	1.076***
Children died								
No								
Yes	1.269***	1.198**	1.225*	1.240**	1.230*	1.139*	1.238**	1.356***

Note: * (p<0.10), ** (p<0.05), *** (p<0.01)

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