Fertility intention and Subsequent Abortion in Matlab, Bangladesh

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Summary

This study investigates the relationship between desire for children and subsequent abortion in the MCH-FP intervention and Comparison areas of Matlab, Bangladesh. Women included in the In-depth Survey 1984 (Cohort-84) and KAP Survey 1990 (Cohort-90) were followed for four years through the Demographic Surveillance System to ascertain subsequent pregnancy outcome. Abortion was higher in the Comparison area than in the MCH-FP area and increased over time in both the areas among those women who wanted no more children. Abortion was higher for those who wanted no more children than those who wanted more, particularly in the recent cohort. The risk of abortion was higher, irrespective of desire for children, for elderly women, those who were educated, among Hindus, users of contraception, those who had some household items, and women in the Comparison area compared to their counterparts. The finding suggests that targeting high quality family-planning services toward women who want to limit family size would reduce abortion as well as fertility.

Introduction

Abortion, legal or illegal, is being practiced in almost all countries of the world. However, variation in the level of abortion across countries depends not only on legality of the procedure but also on religious restrictions and cultural acceptance. According to the Penal Code of 1860, induced abortion is illegal in Bangladesh except to save life of the mother (Bhiwandiwala et al. 1982). Since the late 1970s, the law allows menstrual regulation in the early stages before pregnancy status is clinically confirmed (Akhter and Rider 1983; Ali et al. 1978). Such interpretation of the law, along with the decline in desired family size and availability of menstrual regulation services has contributed to an increase in the incidence of abortion (Dixon-Muller 1988).

In the past, when the law was strict, abortions were usually performed either by self or untrained indigenous practitioners. Since liberalization of the law, menstrual regulation service has become available both in the public and private sectors. The government managed health facilities providing abortion services are: Family Welfare Centre, *Upazila* Health Complex, and District Hospital while non-government facilities are clinics located mainly in cities and towns. Despite all these facilities, most abortions are still being performed either by the client herself or with the help of indigenous practitioners (Ahmed et al. 1997; Ahmed et al. 1996), and many of those who sought modern abortion facilities had experienced traditional method initially (Bhuiya et al. 1999; Caldwell et al. 1999).

Although availability of abortion service has contributed to a substantial increase in abortion in many countries, little increase is observed in many others. This is mainly because of social stigma and religious prohibition against abortion. However, an unsafe abortion may lead to untold physical and mental distress or death. A survey in 1978 estimated that about 21,600 pregnancy-related deaths occurred during the year in Bangladesh, and of these deaths, 25.8% were due to complications of induced abortion (Rochat et al. 1981). Another study reported that a considerable proportion of hospital

resources, in terms of time, bed occupancy, transfusions given, and antibiotics was used or consumed for the management of abortion-related cases (Measham et al. 1981).

A study based on Matlab data documented that abortion was higher in the Comparison area, where quality of family-planning services is poor, than in the MCH-FP area, and abortion was positively associated with socioeconomic status (Ahmed et al. 1997). Another study in Matlab documented that lack of use or lack of use-effectiveness of the family-planning method resulted in unwanted pregnancies, and thus, abortion (Bhuiya et al. 1999). The present study examined the issue further with inclusion of desire for children in the analysis, and a cohort approach was followed to ascertain subsequent pregnancy outcome. The study proposes that desire for children is a predictor of abortion, and the difference in abortion in the two areas is mainly due to difference in quality of family-planning services which resulted in difference in unwanted pregnancies. The objective of the study is to examine the association of desire for children and subsequent abortion, and whether abortion increased irrespective of desire for children.

Methods and Materials

Study Area

Data for the present study came from Matlab *Upazila* where the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) has been maintaining a Demographic Surveillance System (DSS) since 1966. Matlab is a rural area located about 70 kilometres southeast of Dhaka, the capital of Bangladesh. The area is low-lying and the economy is largely based on agriculture (Ruzicka and Chowdhury 1978).

In October 1977, the ICDDR,B launched an experimental Maternal Child Health and Family Planning Programme (MCH-FP) in half of the DSS villages while the other half (Comparison area) continued to receive limited services provided by the government programme (Bhatia et al. 1980). In the MCH-FP area, services have been provided by the Community Health Workers (CHWs) through fortnightly home visit. The CHWs were

local recruits from influential families. They were married and had eight or more years of education and were themselves users of contraception. Each CHW is responsible, on an average, for 20 households to visit per day. During the visit, they ask mothers about their menstrual status, contraceptive use, contraceptive side-effects, pregnancy, breast-feeding, and morbidity. In the follow-up visit, they provide contraceptives and basic medicines and refer patients with complications to subcentre clinics.

In both the areas, contraceptive use in 1975 was as low as 5.0%. In the MCH-FP area, contraceptive use increased from 12.6% in 1977 to 31.1% in 1978 after introduction of the MCH-FP programme. It remained at the same level till 1982 when contraceptive use started to increase, reaching 60.6% in 1990 and to 70.6% in 1996. With the increase in contraceptive use, a remarkable decline in fertility has been observed. The total fertility rate declined from 6.9 in 1976 to 5.1 in 1980, 3.6 in 1990 and 2.7 in 1996. In the Comparison area, contraceptive use is much lower than in the MCH-FP area but has also been increasing. Contraceptive use increased from 4.7% in 1977 to 16.5% in 1984, to 27.2% in 1990, and 46.9% in 1996. The total fertility rate declined from 7.2 in 1976 to 6.7 in 1980, 5.5 in 1990, and 3.2 in 1996.

Data

The study used three sets of data from the Matlab DSS area: In-depth survey of 1984 (In-depth-84), KAP survey of 1990 (KAP-90) and the DSS data of 1984-87 and 1990-93. The primary objectives of both In-depth-84 and the KAP-90 survey were to provide updated information on contraceptive use and maternal and child health service performance from both MCH-FP and Comparison areas (Koenig et al. 1987; Koenig et al. 1992). The In-depth-84 survey was conducted on random cluster samples of 3,785 women of reproductive age in 37 villages and 2,429 women in 40 villages in the MCH-FP and Comparison area respectively. However, young women were under-represented in the In-depth-84 survey due to sampling procedures that excluded newly-married women (Koenig et al.1987). The KAP-90 survey used multi-stage sampling procedure. Thirty-one villages from the MCH-FP area and 36 villages from the Comparison area were

randomly selected to include every alternate women of reproductive age. The total number of respondents interviewed in the KAP-90 survey was 4,238 in the MCH-FP area and 3,708 in the Comparison area.

The DSS collects information on pregnancy outcome, death, migration, marriage, divorce, and household split. During the study period, the DSS events were being recorded by the CHW through fortnightly household visit, and forms were filled-in through household visit every six weeks by Health Assistant (HA) accompanied by the CHW. For all DSS events, except pregnancy termination, household head or any senior member of the household is responsible for providing information. For pregnancy termination, respondent is the mother, and CHWs are responsible for asking questions.

Three types of pregnancy outcome are being recorded by the DSS: live-birth, stillbirth and miscarriages (induced and spontaneous). A pregnancy termination is called a live-birth when the product shows any evidence of life, such as crying, breathing, pulsation, beating of heart or definite movement of voluntary muscles. If the termination occurs at 7 months or afterwards without any sign of life, it is termed as stillbirth. If termination occurs before 7 months gestation without any sign of life, it is termed as miscarriage which can be induced or spontaneous. Induced miscarriage (abortion) is the pregnancy that is terminated intentionally by deliberate action. Spontaneous miscarriage, on the other hand, is the pregnancy that terminates naturally without deliberate action.

The women interviewed in the In-depth-84 and KAP-90 surveys were followed for four years through the DSS data to ascertain subsequent pregnancy outcomes (live-birth, stillbirth, and miscarriage), survival, and migration status. The study excluded those women who were not married at the time of survey, those who were aged 45 years or more, and those who were pregnant or sterilized. Pregnant women were excluded because their subsequent behavior are likely to be influenced by the pregnancy outcome. The permanent method users were excluded because they left with no reproductive choice. Consequently, the final sample consisted of 3,251 women in In-depth-84 survey (1,887 in the MCH-FP and 1,464 in the Comparison area) and 4,136 women in the KAP-90 survey

(2,016 in the MCH-FP and 2,120 in the Comparison area). During the follow-up, a woman might have experienced more than one pregnancy, and such pregnancies were considered a separate event.

Whether more children are wanted has been widely used as a measure of preference in the studies of consistency between reproductive preferences and subsequent behaviour. The studies that used two preference measures have concluded that whether more children are wanted predicts subsequent fertility better than when desired and actual number of children are compared (Freedman et al. 1975; Rodgers 1976; Hermalin et al. 1979). In this analysis, 'whether more children are wanted' is used as a measure of preference. In both In-depth-84 and the KAP-90 surveys, exactly similar questions were asked: 'Do you want more children in future? How many more do you want to have?'

Data Analysis

Both bivariate and multivariate (logistic regression) analyses were used. For logistic regression, the dependent variable took the value of 1 if a respondent had an induced abortion during the follow-up period and 0 if she had a live-birth. The independent variables were: age of women, number of living sons, desire for children, woman's education, possession of household items, religion, and cohort. Except age of the women, all other variables were treated as dummies; interaction of desire for children and cohort was also examined.

Three models were tested for each of the area: (i) Model 1 included all covariates except desire for children, (ii) Model 2 included all covariates in Model 1 and desire for children, and (iii) Model 3 is the final one which included all covariates, along with the interaction term.

The villages exposed to the Maternal Child Health and Family Planning Programme has been termed as 'MCH-FP area' while those exposed to the government programme as termed 'Comparison area'. Number of living son was grouped into two categories (Less

than 2 and 2 or more). Educational levels of women were obtained by asking about completed years of schooling in secular education. Religious education which does not lead to a certificate, has been treated as no education and grouped into two categories (None and one or more). Possession of selected household items, such as quilt, hurricane lamp, bicycle, watch and whether received remittances were used to assess household wealth and grouped into two categories (None and one or more). Religion divides the population into distinct groups based on beliefs and culture (Muslim and Hindu). Women interviewed in the In-depth-84 survey and those interviewed in the KAP-90 survey were subsequently followed for four years and treated as cohort (Cohort-84 and Cohort-90). Woman's desire for children was grouped into two categories (Wanted no more children and wanted more).

The descriptive statistics for the explanatory variable are shown in Table 1. With a few exceptions, the two cohorts were found similar. In fact, Cohort-84 was slightly older, better-educated and low contraceptive user than Cohort-90. It is, therefore, needed to control the effect of these variables in the multivariate analysis.

Bivariate Results

Table 2 shows the number of live-births and ratios (per 1000 live births) of abortion, miscarriage, and stillbirth by cohort and study area. Abortion ratios were found to be higher in the Comparison area than in the MCH-FP area for both the cohorts and increased over time in these two areas. For Cohort-84, abortion ratio was 19 in the MCH-FP area and 45 in the Comparison area compared to 31 and 81 for Cohort-90. Abortion increased over the period by 1.6 times in the MCH-FP area and 1.8 times in the Comparison area. In case of miscarriage, it was higher for the Comparison area than in the MCH-FP area and remained unchanged over time; stillbirth did not follow a consistent pattern. Increase in abortion could be real or due to improvement in reporting. However, it is unlikely that reporting has improved. If reporting would have improved, it would have been improved also for miscarriage and stillbirth, but it did not happened so.

Desire for children was associated with subsequent abortion (Table 3). For Cohort-84, those who wanted no more children had 2.6 times higher abortion in the MCH-FP area and 2.9 times higher abortion in the Comparison area compared to those who wanted more. For Cohort-90, the relationship was much stronger than those for Cohort-84: 7.5 times higher for those who wanted no more children than those who wanted more in the MCH-FP area compared to 4.9 times higher in the Comparison area.

Table 4 shows abortion ratios (per 1,000 live-births) by sociodemographic variables, study area and desire for children. The data of two cohorts were combined to increase cell frequencies. For those women who wanted no more children, subsequent abortion increased in both the areas with increase in age of women, number of living sons and education of women. It was higher among Muslims, user of contraception, and those with one or more household items compared to Hindus, non-users of contraception and those who had no household items. For example, abortion (per 1000 live-birth) in the MCH-FP area was 23 for those who were aged below 25 years and 71 for those who were aged 35 years or more while comparable figures in the Comparison area were 65 and 183. On the other hand, the relationship between sociodemographic variables and subsequent abortion was not usually prominent for those who wanted more children.

Multivariate Results

Abortion was higher in the Comparison area than in the MCH-FP area (Model 1) and it increased over time in both the areas (interaction between area and year was not significant). Abortion increased with increase in age of women. It was higher among Hindus, educated women, users of contraception and those households owned one or more items compared to Muslims, illiterate women, non-users of contraception and those households owned no items. However, such relationship did not change over time (interaction between these socioeconomic variables and cohort was not significant).

Desire for children was found to be highly significant in both the areas (Model 2 compared with Model 3) and it demonstrated extra predicting power (Table 5). In

presence of desire for children (Model 3), all the variables remained almost unchanged except number of living sons, which became insignificant. Abortion increased over time in both the areas and increase was mainly among those women who wanted no more children than those who wanted more (Model 4). In fact, desire for children was associated with subsequent abortion mainly for the recent cohort: those women who wanted no more children had more abortion than those who wanted more.

Discussion

The study has several advantages over those conducted earlier. First of all, cohort approach was followed, and desire for children was included in the analyses. Secondly, data of two periods were observed to see changes over time. Thirdly, the study used data of two areas with similar socioeconomic condition and family size desire but differing in the quality of family-planning services.

Abortion was found to be lower in the MCH-FP area than in the Comparison area, and it increased over time in both the areas. The difference in abortion in these two areas is mainly due to difference in the level of unwanted pregnancies (Razzaque 2000). Contraceptive use is higher in the MCH-FP area than in the Comparison area and such difference is mainly due to the difference in the quality of family planning services (Koenig et al. 1992). This resulted lower level of unwanted pregnancies in the MCH-FP area than in the Comparison area and thus difference in abortion. Earlier analysis of Matlab data, however, did not report significant increase in abortion in the MCH-FP area, and such findings could be due to difference in methodology (cross-section VS cohort).

Desire for children was negatively associated with subsequent abortion particularly in the recent cohort: those woman who wanted no more children had more abortions than those who wanted more. The association became stronger in the later than earlier cohort because abortion increased over time among those women who wanted no more children rather than those who wanted more. Level of abortion is relatively low in Bangladesh,

however, it had increased over time mainly due to increased motivation for small family size as well as decline in family size desire (Razzaque 1996; Bairagi 2000).

Although number of living sons was positively associated with subsequent abortion, such relationships became weak when desire for children was included in the model. This is because desire for additional child is associated with number and sex composition of the existing children. In fact, relationship of this variable and abortion is weak in presence of desire for children, suggesting that desire for children is more proximate determinant of abortion.

Users of contraception (at the time of survey) had higher subsequent abortion than non-users. This could be due to the fact that users of contraception had higher motivation either to limit or to postpone subsequent birth compared to the non-users. A contraceptive user who wants to limit family size can subsequently be pregnant either for discontinuation due to side-effects, change in family-size desire or use-failure (Caldwell et al. 1999). In the Matlab MCH-FP area, previous research had documented that 12 months' discontinuation of all contraception method was about 35% (Razzaque et al. 1998), while use-failure rates were 1% for injectables, 3% for IUDs, and 15% each for pills and for other methods (Bairagi and Rahman, 1996).

High incidence of abortion among those who wanted no more children has strong programmatic implications for the reduction of abortion in Bangladesh. The family-planning programme should adopt strategies to improve quality of services (reduce failure, discontinuation, and so on), particularly for those women who want to limit family size in order to reduce abortion and population growth.

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Table 1. Mean value for explanatory variables by study area and cohort

Variable	Cohort-84		Cohort-90	
	MCH-FP	Comp.	MCH-FP	Comp.
Age of women	26.2	27.0	25.6	26.1
Two or more sons (yes)	0.37	0.43	0.26	0.34
One or more year(s) of education (yes)	0.50	0.39	0.41	0.34
User of contraception (yes)	0.27	0.08	0.46	0.19
Muslim (yes)	0.88	0.88	0.86	0.91
One or more item(s)	0.57	0.53	0.60	0.53
Wanted no more children (yes)	0.71	0.60	0.78	0.67

Source: In-depth 1984 and KAP 1990

Table 2. Number of live-births and ratios (per 1000 live births) of abortions, miscarriages, and stillbirths by cohort and study area

Cohort	No. of live-births		Abortion		Miscarriage		Stillbirth	
	MCH-FP	Comp.	MCH-FP	Comp.	MCH-FP	Comp.	MCH-FP	Comp.
1:Cohort-84	1851	1401	19	45	69	74	36	29
2:Cohort-90	1956	1960	31	81	64	74	24	37
Ratio (2:1)	--	--	1.6	1.8	0.9	1.0	0.7	1.3

Source: In-depth 1984 and KAP 1990

Table 3. Abortion ratios (per 1000 live-births) by desire for children and cohort, MCH-FP and Comparison areas

Desire for children	MCH-FP			Comparison		
	Cohort-84 (1)	Cohort-90 (2)	Ratio (2:1)	Cohort-84 (3)	Cohort-90 (4)	Ratio (4:3)
1: Wanted more	13	13	1.0	26	37	1.4
2: Wanted no more	34	97	2.8	75	182	2.4
Ratio (2:1)	2.6	7.5	--	2.9	4.9	--

Source: In-depth 1984 and KAP 1990

Table 4. Abortion ratios (per 1000 live-births) by sociodemographic variables, study area, and desire for children

Variable	Wanted more				Wanted no more			
	MCH-FP	(LB)	Comp.	(LB)	MCH-FP	(LB)	Comp.	(LB)
Age of women (year)								
Below 25	12	(1691)	20	(1383)	23	(131)	65	(170)
25-34	15	(1151)	49	(860)	61	(619)	97	(773)
35+	14	(70)	61	(49)	71	(241)	183	(349)
No. of living sons								
Less than 2	13	(2401)	23	(1903)	52	(276)	76	(331)
Two or more	13	(511)	39	(389)	63	(715)	133	(961)
Contraceptive use								
Non-user	11	(1915)	26	(2021)	35	(548)	95	(1037)
User	18	(997)	77	(271)	88	(443)	204	(255)
Education of women (year)								
None	12	(1556)	22	(1409)	35	(564)	106	(884)
One or more	15	(1356)	48	(883)	89	(427)	137	(408)
Possession of items								
None	9	(1203)	24	(1080)	30	(428)	106	(614)
One or more	16	(1709)	39	(1212)	80	(563)	125	(678)
Religion								
Hindu	14	(427)	25	(243)	82	(73)	182	(121)
Muslim	13	(2485)	33	(2049)	57	(918)	109	(1171)

Sources: In-depth 1984 and KAP 1990
LB=Number of live-births

Table 5. Logistic regression models (odds ratios) of incidence of subsequent abortion

Characteristics	**Model 1**	**Model 2**		Model 3		Model 4	
	All	MCH-FP	Comp.	MCH-FP	Comp.	MCH-FP	Comp.
Age of women (cont.)	1.10**	1.09**	1.10**	1.06**	1.09**	1.06**	1.09**
No. of living sons							
Less than 2	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2 or more	1.85**	1.93**	1.81**	1.35	1.41	1.34	1.39
Education of women (yrs)							
None	1.00	1.00	1.00	1.00	1.00	1.00	1.00
One or more	1.80**	1.83**	1.79**	1.84**	1.82**	1.88**	1.84**
Contraceptive use							
Non-user	1.00	1.00	1.00	1.00	1.00	1.00	1.00
User	2.27**	2.13**	2.36**	1.99**	2.26**	1.95**	2.26**
Religion							
Hindu	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Muslim	0.60**	0.77	0.55**	0.70	0.55*	0.68	0.56
Possession of items							
None	1.00	1.00	1.00	1.00	1.00	1.00	1.00
One or more	1.42**	1.97**	1.27	1.95**	1.25	1.97**	1.24
Desire for children							
Wanted no more	--	--	--	1.00	1.00	1.00	1.00
Wanted more	--	--	--	0.35**	0.53**	0.73	0.77
Cohort							
Cohort-84	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Cohort-90	1.87**	1.63*	2.02**	1.68*	2.05**	2.75**	2.45**
Study area							
Comparison	1.00	--	--	--	--	--	--
MCH-FP	0.31**	--	--	--	--	--	--
Desire for children*Cohort	--	--	--	--	--	0.31**	0.59^{+}
-2 log likelihood	2284.6	811.4	1468.9	797.2	1459.1	790.2	1456.5
(df)	(8)	(7)	(7)	(8)	(8)	(9)	(9)

Sources: In-depth 1984 and KAP 1990

**p<0.01, *p<0.05 and $^{+}$p<0.10