

## Factors associated with adolescent abortion in a rural area of Bangladesh

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### Summary

This study examines levels and trends in abortion among adolescent girls in 1982–98 and identifies groups of adolescents who are at high risk for having an abortion. The study used data sets collected in Matlab in Bangladesh where the Center for Health and Population Research at ICDDR,B, has maintained a demographic surveillance system, since 1966. Both bivariate and multivariate techniques of analysis were employed. We also used qualitative information derived from in-depth interviews with adolescents. The incidence of abortion was 35 times higher for unmarried than for married adolescents. Abortion ratios were also higher for adolescents who were <18 years old and for those with more than primary education. A little less than half of the abortions were induced by biomedical health workers (by means of menstrual regulation) which means that traditional providers fulfilled an important function in this rural area. The findings suggest that high-quality abortion services provided to adolescents in the framework of comprehensive reproductive health services will help to lower abortions in general and of unsafe abortions provided by traditional providers in particular.

**keywords** induced abortion, adolescents, population-based study, contraception, Bangladesh

### Introduction

Early marriage and initiation of childbearing by adolescent girls is a major reproductive health challenge in a number of Asian countries, with one in three commencing childbearing (i.e. already pregnant or a mother) before age 20 (WHO 1995). A number of studies have documented the social, economic and health problems associated with early and unplanned pregnancies in these countries (WHO 1995, 1997; Singh 1998; Lin *et al.* 1999; Tai-hwan *et al.* 1999; Ganatra & Hirve 2002). One of the consequences of this early childbearing is unwantedness of a number of these pregnancies and induced abortion – both legal and illegal – is a frequently used method to deal with this problem.

As abortion is illegal or legally restricted in many Asian countries, young women turn to unsafe practitioners or resort to dangerous self-induced methods. As a consequence, adolescents in these developing countries run a high risk of complications leading to hospitalization or death (Chaturachinda *et al.* 1981; Ladipo 1989; WHO 1997). Complications related to unsafe induced abortion are one of the major causes of maternal mortality. A review of nine studies conducted in developing countries showed that the percentage of maternal deaths because of abortion averaged 15% (Walsh *et al.* 1993). However, data are rarely available on maternal mortality by age, which means

that it is often not known what percentages of these abortions occurred among adolescents.

In Bangladesh, the penal code permits induced abortion only to save a woman's life. However, menstrual regulation (MR) by means of vacuum aspiration is not regulated by this code, because it is considered an 'interim method for establishing non-pregnancy' (Dixon-Muller 1988; Piet-Pelon 1997). It is permitted to be used for a period up to 10 weeks since the last menstrual period and is in principle available free of cost in government health facilities. These MRs are performed by doctors and Family Welfare Visitors (FWVs; nurses and other paramedics) working in government and private hospitals and clinics. Singh *et al.* (1997) developed a methodology to estimate the number of induced abortions in Bangladesh relying to a large extent on data from health facilities. They estimated that a total of 468 000 procedures took place in 1995 in government hospitals and Health and Welfare Centers and in clinics of private organizations. An estimated additional 26 200 clandestine (and unsafe) abortions were induced by traditional providers. The total number of abortions in 1995 was thus estimated at 730 000 leading to an abortion rate of 28 per 1000 women aged 15–44 or an abortion ratio of 18% of known pregnancies (Singh *et al.* 1997).

Research on adolescent abortion is difficult to conduct in a country like Bangladesh, because it is a controversial and

M. K. Ahmed *et al.* **Adolescent abortion in Bangladesh**

sensitive issue and social stigma is often attached to it. Hospital-based studies are inadequate to describe in an accurate and unbiased manner the extent of its occurrence and its consequences and population-based studies on abortion are rare. Population-based studies can provide valuable data that are complementary to the data gathered in hospital-based studies. The Matlab Health and Demographic Surveillance System (HDSS) operated by the Center for Health and Population Research at ICDDR,B based in Dhaka, Bangladesh provides a unique opportunity for analysis of abortion among adolescents using population-based data. We report on results of this system with a focus on practices, levels and determinants of abortion among adolescents.

## Data and methods

### Setting

The study area is located in Matlab *thana* about 50 km south of Dhaka and has a population of about 200 000. The region is predominantly agricultural and the level of literacy, particularly among women, is low. The large majority of the population is Muslim. Since October 1977, a reproductive and child health project (at that time called the Maternal Child Health and Family Planning or MCH-FP project) has been in operation in the MCH-FP (or intervention) area with a population of about 100 000 while the other half functioned as a control area. The project was initiated by the Center for Health and Population Research at ICDDR,B. The MCH-FP project has provided more accessible and high-quality family planning and health services in the MCH-FP area than the standard government services provided in the control zone. Before the implementation of the MCH-FP programme, both areas were similar demographically and socio-economically (Razzaque *et al.* 1998). After introduction of the interventions in the MCH-FP area, the decline in both fertility and mortality was faster than in the control zone.

In both areas, MR services are provided by trained female paramedics working in government hospitals and Health and Family Welfare Centers. From its beginning in 1977, the MCH-FP programme also provided MR services in the MCH-FP area, as backup in case of contraceptive failure, in addition to those offered by government clinics (Bhatia & Ruzicka 1980). However, this was discontinued in 1983 when donors withdrew their support from this part of the programme.

One of the components of the Matlab project is its HDSS operated by ICDDR,B since 1996 (ICDDR,B 2002). In this system, households were first visited by female Community Health Workers (CHWs) every 2 weeks who collected

information on vital events including births, deaths and in- and out-migrations. Male Health Assistants (HAs; together with the CHWs) also visited households approximately once a month. The HAs checked the data collected by the CHWs, brought the population registers up to date and filled in the various registration forms. One of these is the birth registration form that includes questions on pregnancies and their outcomes. There were two versions of this form; an earlier one with a few questions on pregnancy outcomes was used until 1989 and an expanded version was introduced in 1989. With this last version it was possible to obtain data on who provided or assisted with the induced abortion and the methods that were employed. A distinction was made between modern providers (doctors and FWVs) and traditional providers (persons in the community with experience in health matters including abortions, but without formal training).

### Data

Several sources of data were used. First, we analysed over 100 000 pregnancy outcomes including abortions during 1982–98 as registered on the birth forms by the CHWs and HAs. Secondly, we collected details on all abortions that took place from 1989 onwards such as who performed or assisted with the abortion. Thirdly, in-depth interviews were held with a sample of 30 adolescents and adults who had had an abortion. These girls and women were identified through the records that were maintained by HDSS and were randomly selected. Fourthly, we analysed data from the Record Keeping System (RKS) that was maintained in the MCH-FP area. In this system, data were collected on morbidity and use of health services by children and women of reproductive age. Data on use of contraception were also available and used to determine whether contraception was used prior to the present pregnancy.

One limitation of the HDSS data is that abortions were underreported, especially abortions of unmarried adolescents. Bangladesh is a society which places great value on the virginity and chastity of women and it does not tolerate children born out of wedlock (Maloney *et al.* 1981). If such conceptions occur, there is strong pressure to terminate them before it becomes public knowledge. HDSS in principle collected information on all pregnancies including out-of-wedlock pregnancies and their outcomes, but it is likely that a number of these pregnancies and their outcomes were missed by the CHWs and HAs. An additional reason for underreporting of abortions could have been that some induced abortions were reported as spontaneous abortions. We believe that the extent of underreporting of induced abortions remained roughly the same over time in both areas. This is corroborated by a study in Matlab showing

that the percentages of all pregnancies that ended in induced abortions were fairly constant between 1982 and 1998, as were differences between the two areas (Ahmed *et al.* 1998). Despite this limitation, HDSS data are useful for analysing factors that are associated with abortion.

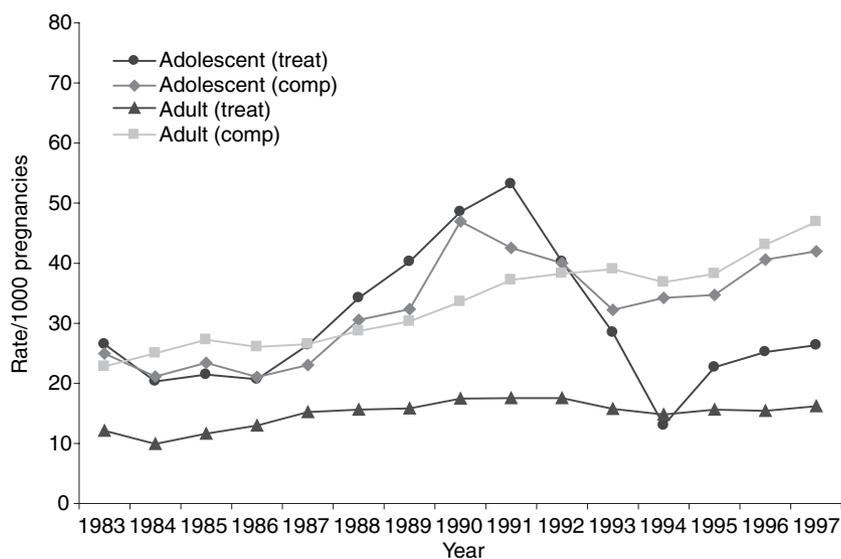
### Analysis

We analysed abortions by women younger than 20 and compared them with those of adults 20–34 years old. We determined relationships of a number of explanatory relationships with abortion ratios for the following variables: maternal age, pregnancy order, marital status, education, household space (a proxy for household income), religion and area (MCH-FP and control). The first step in the analysis was to examine unadjusted associations between the explanatory variables and induced abortion ratios (both for adolescents and adults). In order to estimate the net effects of the explanatory variables, logistic regression models were used in which all explanatory variables were included. These logistic regressions were carried out for adolescents and adults separately. The chi-square test was used to determine statistical significance of relationships and a cut-off point of 0.05 was used to determine significance or non-significance (NS).

### Results

#### Levels and determinants

Figure 1 shows 3-year moving annual abortion ratios per 1000 pregnancies for both adolescents and adults.



**Figure 1** Three-year moving-average abortion ratios per 1000 pregnancies by area in Matlab, 1982–98.

Adolescent abortion ratios increased in both the MCH-FP and control areas between 1982 and 1991, followed by a decrease in both areas between 1991 and 1993–94 and another increase thereafter. In contrast, the incidence of abortion for adults regularly increased in the control area, but remained at the same level in the MCH-FP area.

Abortion ratios per 1000 pregnancies for both adolescents and adults by social and demographic characteristics are shown in Table 1. The average annual abortion ratio in 1982–98 for adolescents was 29.3 per 1000 pregnancies, and 24.2 for adults. The abortion ratio of adolescents under 18 was much higher than that of 18 and 19 year olds. However, abortion ratios increased with maternal age among adults. There was no relationship of parity with abortion ratio among adolescents, but there was a positive relationship with parity among adults (especially after three or more pregnancies). Abortions were far more common among the unmarried: 73% of all out-of-wedlock pregnancies of adolescents and 66% of adults were aborted. The chance of an abortion increased with maternal education and, to a lesser extent, household space. The abortion ratio among Muslim adolescents and adults was higher than for non-Muslims. Adolescent abortion ratios in the MCH-FP area were a little lower than in the control area, and about twice as low in adults.

Logistic regression analysis (Table 2) revealed a negative relationship of maternal age with abortion [e.g. the odds ratio (OR) at age 19 was 26% lower than at age 18] for adolescents, indicating that abortions were more common among young adolescents. In case of adults, the ORs of abortion increased with maternal age (e.g. the OR at age 22 was 9% higher than at age 21). The likelihood of

M. K. Ahmed *et al.* **Adolescent abortion in Bangladesh****Table 1** Induced abortions per 1000 pregnancies for adolescents and adults (20–34 years old), by social and demographic characteristics, Matlab, 1982–98

	Number of pregnancies		Abortion ratio/1000	
	Adolescents	Adults	Adolescents	Adults
<b>Maternal age (years)</b>				
<18	4669		44.1	
18–19	11 468		23.3	
20–24		40 972		17.2
25–29		32 777		22.7
39–34		19 261		41.4
<i>P</i> -value			<0.001	<0.001
<b>Pregnancy order</b>				
1	12 225	14 579	29.8	17.3
2	3074	17 729	27.0	14.3
3+	805	58 505	31.1	28.5
<i>P</i> -value			0.38 (NS)	<0.001
<b>Marital status</b>				
Married	15 927	92 815	20.0	22.8
Unmarried*	210	195	733.3	661.5
<i>P</i> -value			<0.001	<0.001
<b>Maternal education</b>				
None	8200	53 098	23.8	20.0
Primary	5057	26 139	29.9	25.1
Primary+	2519	13 102	49.6	39.7
<i>P</i> -value			<0.001	<0.001
<b>Dwelling space</b>				
Small	3704	23 271	26.2	20.7
Medium	8577	47 803	28.3	24.1
Large	3853	21 908	34.3	27.9
<i>P</i> -value			0.37 (NS)	<0.01
<b>Religion</b>				
Muslim	14 310	81 117	30.0	24.6
Non-Muslim	1827	11 893	25.7	21.3
<i>P</i> -value			>0.50 (NS)	<0.05
<b>Study area</b>				
MCH-FP	7611	42 749	28.0	17.3
Comparison	8526	50 261	30.5	29.9
<i>P</i> -value			>0.50 (NS)	<0.001
All	16 137	93 010	29.3	24.2

Total of some of the variables do not equal the grand total due to a number of cases with unknown values.

MCH-FP, Maternal Child Health and Family Planning; NS, non-significance.

\* A few divorced and widowed women are included in the unmarried adult group.

abortion for adolescents increased sharply with pregnancy order in both adolescents and adults. There is a difference here with results of the bivariate analysis where with respect to adolescents, where no relationship of abortion and parity was found.

**Table 2** Odds ratios (and confidence intervals, CI) of abortion for adolescents and adults (after controlling for other variables), Matlab, 1982–98

Characteristic	Adolescents (95% CI)	Adults (95% CI)
Maternal age*	0.74 (0.69–0.81)	1.09 (1.07–1.10)
<i>P</i> -value	<0.001	<0.001
<b>Pregnancy order</b>		
1	1.00	1.00
2	1.90 (1.41–2.39)	1.23 (0.98–1.45)
3+	2.16 (1.40–2.37)	1.96 (1.57–2.24)
<i>P</i> -value	<0.001	<0.001
<b>Marital status</b>		
Married	1.00	1.00
Unmarried	165.35 (141.86–192.73)	238.27 (197.81–287.01)
<i>P</i> -value	<0.001	<0.001
<b>Maternal education</b>		
None	1.00	1.00
Primary	1.39 (1.10–1.82)	1.38 (1.25–1.54)
Primary+	2.63 (2.06–3.55)	2.52 (2.24–2.83)
<i>P</i> -value	<0.001	<0.001
<b>Dwelling space</b>		
Small	1.00	1.00
Medium	0.92 (0.70–1.21)	1.09 (0.97–1.21)
Large	1.00 (0.74–1.38)	1.18 (1.03–1.38)
<i>P</i> -value	0.31 (NS)	<0.05
<b>Religion</b>		
Muslim	1.00	1.00
Non-Muslim	0.76 (0.52–1.11)	1.03 (0.89–1.18)
<i>P</i> -value	0.26 (NS)	0.15 (NS)
<b>Study area</b>		
MCH-FP	1.00	1.00
Comparison	1.13 (0.97–1.41)	1.82 (1.66–2.01)
<i>P</i> -value	0.08 (NS)	<0.001
–2 log-likelihood	3231	19 319

Total of some of the variables do not equal the grand total due to a number of cases with unknown values.

MCH-FP, Maternal Child Health and Family Planning; NS, non-significance.

\* Continuous variable.

The size and direction of the adjusted relationships of the other variables in Table 2 are roughly similar to those of the unadjusted relationships in Table 1. The OR of abortion among unmarried women was extremely high compared with married women. The likelihood of abortion increased with maternal education in adolescents and adults. Among adolescents the odds of an abortion were a little higher in the control than in the MCH-FP area (but the difference was not statistically significant). However, among adults the odds of an abortion were 82% higher for women residing in the control area (statistically highly significant).

### Providers and practices

Table 3 shows for adolescents that 43% of all abortions were conducted by health workers and 57% by traditional providers (average of 1989–98). These percentages were nearly the same for adults (45% *vs.* 55%). Women who had an abortion and lived in the MCH-FP area used biomedical providers more frequently (statistically significant in adults only). Table 3 also shows that women with some education were more likely to use the services of biomedical health workers.

Detailed analysis of the birth registration forms and in-depth interviews revealed that there were two types of modern providers: FWVs and doctors. The MR procedure was used by FWVs (working in government hospitals and Health and Welfare Centers). The (few) abortions done by doctors were MR and sometimes dilatation and curettage procedures.

The in-depth interviews supplied more details on traditional providers and the methods they employed. Three types of traditional providers are active in this rural area of Bangladesh: *kobiraj*, village doctors and homeopaths. The *kobiraj* or traditional healers are the most important of the three groups. *Kobiraj* are women who have been trained by other *kobiraj*. They rely on a combination of use of herbal medicine and insertion of the root or vine of a creeper plant in the cervix and uterus. They either give medicine or do the insertions themselves or they give medicines together with instructions on how women should insert the root or vine. Insertion takes place at home or at the house of a relative or in a place arranged by the *kobiraj*. Village

**Table 3** Induced abortions by modern provider, by area and education among adolescents and adults (20–34 years old), Matlab, 1989–98

	Adolescents		Adults	
	%	Number of abortions	%	Number of abortions
Percentage using modern provider and area				
MCH-FP	47.2	106	55.5	443
Comparison	40.1	158	40.1	995
Total	43.2	264	44.9	1438
P-value	0.25 (NS)	<0.001		
Percentage using modern provider and education				
No education	29.0	93	39.2	653
Some education	50.9	169	49.6	782
Total	43.1	262	44.9	1435
P-value	<0.001	<0.001		

MCH-FP, Maternal Child Health and Family Planning; NS, non-significance.

doctors prescribe drugs or give injections, and homeopaths dispense homeopathic medicine such as herbs. The *kobiraj* are usually contacted at home while village doctors and homeopaths usually work in market stalls. A few women claimed to have induced the abortions themselves, e.g. by swallowing large numbers of oral contraceptives or other drugs; they are included here in the group of abortions carried out by traditional providers.

In-depth interviews also revealed that MR services are considered to be relatively expensive and are often performed after 10 weeks of gestation. The regulations are that doctors and FWVs should provide abortion services free of charge. However, a number of them charged a fee, for example, if the foetus was more than 10 weeks old (which is the legal limit for carrying out MR). In addition, these procedures are often conducted in government hospitals with little respect for the privacy of the patients.

The in-depth interviews revealed that among adolescents by far the most important reason for an abortion is the social unacceptability of out-of-wedlock pregnancies. Other important reasons were failure of contraceptives, economic (e.g. the pregnancy follows too soon after another) and health (e.g. to preserve the women's health), especially for adults.

### Contraceptive use prior to abortion

Table 4 shows abortion rates for those who did and did not practice contraception prior to the abortion (in the MCH-FP area). Adolescent girls and adult women who used contraceptives prior to the current pregnancy were two and three times more likely to have an abortion than non-users of contraception. The higher incidence of abortion among contraceptive users was probably due to incorrect and inconsistent use of a method or method failure. This was especially the case for those who used condoms and 'other' methods.

### Discussion

In a longitudinal, population-based study carried out in a rural area of Bangladesh in 1982–98 we compared abortion ratios in an area where an intensive reproductive and child health programme was implemented (MCH-FP area) with an area in which government services were available (control area). The first of two key findings was that for adolescents the average annual abortion ratio in the MCH-FP area was nearly similar to that of the control area. The second key finding was that for adults (20–34 years old) the abortion ratio in the MCH-FP area was nearly half of the ratio in the control area. An implication of the first

**Table 4** Abortions and odds ratios by contraceptive use prior to current pregnancy among adolescents and adults (20–34 years old), MCH-FP area, Matlab, 1982–98

Non-user <i>vs.</i> user	Adolescents			Adults		
	Number of pregnancy outcomes	Abortion ratio*	Odds ratio† (95% CI)	Number of pregnancy outcomes	Abortion ratio*	Odds ratio† (95% CI)
Non-user	3279	8.5	1.00	25 651	10.0	1.00
User	567	17.6	2.30 (1.79–2.95)	7902	30.8	4.00 (3.78–4.23)
Oral contraception	441	15.9	2.03 (1.52–2.71)	4937	22.7	2.64 (2.44–2.85)
Intra-uterine device	45	2.2	–	754	25.2	3.03 (2.57–3.57)
Injection	17	–	–	763	26.2	3.19 (2.68–3.79)
Condom	49	40.8	7.42 (4.41–9.32)	861	66.2	17.63 (15.72–19.77)
Other methods	15	–	–	587	59.6	13.29 (11.98–14.74)
Total	3846	9.9	–	33 553	14.9	–

MCH-FP, Maternal Child Health and Family Planning; CI, confidence interval.

\* Per 1000 pregnancies.

† All odds ratio (including CI) are of users *vs.* non-users and are statistically significant at  $P < 0.001$  level.

finding is that access to high-quality family planning services for adolescents is still a problem in Matlab. Better access to high-quality contraceptive services for adolescents is, therefore, likely to reduce further the number of abortions. The implication of the second finding is that the intensive family planning programme of the MCH-FP area was more successful in reducing the number of abortions of adults than the family planning programme of the control area (Ahmed *et al.* 1998; Rahman *et al.* 2001). As a result of the intensive family planning programme in the MCH-FP area there were fewer unwanted pregnancies and a smaller unmet need for contraceptive services than in the control zone, as indeed found in surveys conducted in Matlab in 1990 and 1996 (Van Ginneken & Razzaque 2003). A consequence of all of this is that there were fewer non-users of contraceptive methods in the MCH-FP than in the control area. Non-users had fewer abortions than users. However, the impact of the intensity of the family planning programme on the incidence of abortions was much larger than the (opposite) effect of use *vs.* non-use of contraceptive methods.

The annual abortion ratios of adolescents and adults (20–34 years old) in both areas combined averaged 29 and 24 per 1000 pregnancies respectively in 1982–98. This raises the question how these figures compare with the figures for Bangladesh as a whole. In view of the special circumstances prevailing in the MCH-FP area, we will focus on the figures for the control area alone. The abortion ratio in this area was about 30 per 1000 pregnancies for women 15–34 years old and 35 per 1000 for women 15–49 years old (in 1982–98). Singh *et al.* (1997) estimated the abortion ratio for Bangladesh as a

whole as 180 per 1000 pregnancies in 1995 – five times higher than what we found in the control area of Matlab. The Matlab ratios are too low, because a number of pregnancies and abortions were missed by HDSS. Birth registration forms are inadequate to obtain unbiased estimates on the incidence of abortion (and they were also not designed for this purpose). Clearly, more research needs to be done both in Matlab and in Bangladesh to determine abortion ratios and rates more accurately than is the case now. Support for the thesis that the incidence rates derived from HDSS are too low is provided by a small, exploratory study conducted in Matlab in 1996/97 by Johnston (1999).

Bivariate and multivariate analysis showed that the risk of abortion for unmarried adolescents was 35 times higher than that of married counterparts. This is due to the strong taboo in Bangladesh, especially in rural areas, on out-of-wedlock pregnancies as has been pointed out, for instance, by Aziz and Maloney (1985) and Fauveau and Blanchet (1989). Illegitimate pregnancies ruin the reputation of the girl or women affected and are considered a shame on her family. In many cases, the unacceptability of an out-of-wedlock pregnancy was the real reason of abortion for unmarried adolescents. The unacceptability of these pregnancies can also be derived from HDSS data showing that in each year the number of illegitimate births is extremely low.

A little less than half of all adolescent and adult abortions were MRs, mostly carried out by FWVs in government hospitals and Health and Welfare Centers. Hence, over half of all abortions were performed by *kobiraj*, village doctors and homeopaths or by the girls and

M. K. Ahmed *et al.* **Adolescent abortion in Bangladesh**

women themselves. It is in particular these clandestine and unsafe abortions that lead to complications involving hospitalization and death. In Matlab, these abortions cause 18% of all maternal deaths (in 1976–85) (Fauveau *et al.* 1988).

We found a strong impact of education on the decision to have an abortion and whether to seek the assistance of a modern or traditional provider. Women with at least some education were in a better position to use MR services provided by government hospitals and Health and Welfare Centers than women with no education. Girls or women without any education resorted more often to the services of *kobiraj*, village doctors and homeopaths, as a result of lack of knowledge of modern facilities or inability to make adequate use of them and the lack of income often associated with lack of education (Lin *et al.* 1999; Geelhoed *et al.* 2002).

Failure to use a method of contraception correctly and consistently was a reason for adolescents to have an abortion, but much less important than out-of-wedlock pregnancies. Adolescent girls and adult women who used contraceptives before the current pregnancy were much more likely to resort to an abortion than those who did not, especially those who used condoms or 'other' (mostly traditional) methods. This is in accordance with findings from another study conducted in Matlab on pregnancy rates after adoption of various contraceptive methods (Bairagi & Rahman 1996).

Our study confirms that there is an urgent need for high-quality abortion and contraceptive services for adolescents to be provided in the framework of comprehensive reproductive health services in this rural area of Bangladesh. This is in agreement with the recommendations made by leading observers and results of international conferences with respect to developing countries in general (Fathalla *et al.* 1990; UN 1995). The quality of the existing MR services in Matlab provided by FWAs and doctors of government hospitals should be improved by making them less expensive and by providing more privacy. This would reduce the number of unsafe and clandestine abortions provided by traditional practitioners. Our study also draws attention to the need to provide high-quality contraceptive services for adolescents.

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M. K. Ahmed *et al.* **Adolescent abortion in Bangladesh**

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