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A New Direction in Population Policy and Family Planning in the Islamic Republic of Iran

By Akbar Aghajanian

The author of this article is Professor of Sociology, Fayetteville State University, Fayetteville, North Carolina, United States of America. An earlier version was presented as a paper at the 1994 Annual Meeting of the Middle East Association of America, Phoenix, Arizona, 19-24 November.

The most important aspect of the new programme's success is the interest, support and guidance of religious leaders, and this holds many implications for other Muslim countries

The birth control policy of the Islamic Republic of Iran can be traced back to 1967, from which time it continued to operate up to 1979. The policy was relaxed in 1979 following the establishment of the Islamic Republic but it was revived again in 1989. This article focuses on population policy changes and contraceptive use in the Islamic Republic of Iran since the establishment of the family planning programme in 1967. Before considering population policy and contraceptive use, an account of the country's population growth and change is presented.

Figure 1 shows the size of the Iranian population since 1900. The population size for the years before 1956 are best estimates (Bharier, 1968). From 1956, the decennial censuses, which were carried out in 1956, 1966, 1976 and 1986, provide useful benchmark data from which can be observed demographic change in recent decades. The country's first modern census in 1956 recorded a population of 18.9 million. Twenty years later in 1976, a population of 34.3 million was counted, which increased to 49.5 million in 1986. The most recent data from a 1991 population survey revealed a population of 55.8 million. The 1994 ESCAP Population Data Sheet estimates a mid-year population of almost 64.9 million (ESCAP, 1994).

Population growth was slow up until the end of the first quarter of the twentieth century. Bharier (1968) estimates that from 1900 to 1926 the average rate of population growth was less than 1 per cent per year. Apparently reflecting improvements in the standard of living, population growth doubled during the second quarter of the century. After the Second World War, the rate of population growth accelerated further, owing primarily to improvements in public health and notably to the eradication of malaria (Banani, 1961).

Table 1 summarizes the changes in the indicators of population dynamics since 1966. Between 1966 and 1976, the country's population increased at an average annual rate of 2.7 per cent. This decreasing trend in the rate of population growth reflects a lowering of the birth rate as shown in table 1. The total fertility rate (TFR) declined from 7.7 to 6.3, a decline of almost one child per woman. In sum, during the late 1960s and early 1970s, the country had entered a new phase in its demographic transition, one characterized by the onset of fertility decline. Although the lowering of the birth rate at the national level was relatively moderate, a major drop in fertility in urban areas clearly signalled the potential for a broad-based fertility decline.

Table 1: Population growth rate in the Islamic Republic of Iran, 1900-1986

Year	Population (millions)	Average annual growth rate (%)
1900	9.9	-
1927	12.0	0.8
1935	13.5	1.5
1941	14.8	1.5
1956	18.9	2.2
1966	25.7	3.1
1976	33.7	2.7
1986	49.4 ^a	3.8 ^b
1991	55.8	2.5 ^c

Source: Bharier, 1968; 1956-1986 rates are calculated from censuses.

Notes: a Includes 1.8 million refugees from Afghanistan.

b Growth rate calculated with the exclusion of 1.8 million refugees from Afghanistan is 3.4 per cent per year.

c Rate of growth as calculated by the Iran Statistical Center.

During the decade 1976-1986, the size of the Iranian population increased from 33.7 million to 49.4 million (Iran Statistical Center, 1990). This implies an average annual growth rate of 3.8 per cent during the post-revolutionary era. This high rate of population growth is partially accounted for by the influx of 1.8 million refugees from Afghanistan between 1980 and 1986. However, analysis of the available data suggests a marked increase in the crude birth rate during the 1976-1986 period. TFR increased from 6.3 in 1976 to 7.0 in 1986 (Aghajanian, 1991b).

Currently there is an indication that infant and child mortality continued to decline, especially during the 1980s. Infant mortality was estimated at about 112.4 per thousand live births during the period 1973-1976 (Iran Statistical Center, 1990). Estimates from the 1986 census reveal a rate of 88 per thousand by 1980 and a rate of 68 per thousand by 1986 (United Nations, 1992). It seems that the decline in infant mortality accelerated during the late 1980s. By 1992, an infant mortality rate of 43 per thousand births was reported (Population Reference Bureau, 1992). This is a decline of almost 60 per cent in infant mortality during the period 1976-1992. The increase in fertility and decline of infant mortality accelerated population growth during the period 1976-1986.

Table 2: Population indicators in the Islamic Republic of Iran, 1966-1986

Indicators	1966	1976	1986
Population size (millions)	25.7	33.7	49.4
Crude birth rate	49.0	42.7	47.6
Total fertility rate	7.7	6.3	7.0

Although traditional methods of contraception, including "coitus interruptus", have been practised from the earliest times in what is now the Islamic Republic of Iran (Moore and others, 1974), modern contraceptives were first introduced in 1960 when the commercial sector was allowed to import oral contraceptives for the private market. After the results of the second National Population Census were announced in 1966, it became obvious to government officials that there was a crucial need for a family planning programme, since the situation concerned not only the health of mothers and children but also the socio-economic future of individual families and the country as a whole. The Council of Family Planning was established in the Ministry of Health in 1967; the official family planning programme was launched with the appointment of an under-secretary in the Ministry of Health.

The aim of the programme was defined as the betterment and promotion of the physical, mental and socio-economic welfare of the family. The goal of the national policy was to increase health and welfare standards and to decrease the annual population growth rate. Later, during the Fifth Development Plan period (1973-1978), it was suggested that a national family planning programme would facilitate socio-economic growth through a reduction in the population growth rate from 3.1 per cent in 1971 to 2 per cent in 1978 (Plan and Budget Organization, 1973). Furthermore, Article 42 of the new penal code, passed by the Parliament on 16 June 1973, repealed restrictive abortion and sterilization laws. The new law, which was put into effect in November 1976, stated that "any type of medical or surgical procedure can be performed by a recognized physician with agreement of those who have the right to consent to the procedure in accordance with rules and regulations approved by the Government". This law created a loophole for carrying out induced abortions. In addition, university and high school curricula were permitted to include family planning information and population education (Nortman and Hofstatter, 1978). Therefore, the Government's attitude towards family planning changed from the stage, during the early 1960s, of enabling family planning choice and decision-making and making contraceptives available through the commercial sector to a stage in the later years of the 1960s and early 1970s characterized by active government concern about family welfare and the distribution of contraceptives through public clinics. The third stage of the aggressive programme involved a huge mass media campaign to promote family planning, as concern over the adverse effects of population growth on national economic growth heightened in the mid-1970s. However, by 1977, at the peak of the promotion of family planning activities, only 11 per cent of eligible women were using contraceptives (Aghajanian, 1989).

1979-present

The Islamic Republic of Iran did not consider population growth as a problem following its establishment in 1979, when population as a policy matter was dropped from the Government's agenda. The Family Planning Council of Iran was dissolved and the Government of the Islamic Republic of Iran officially discontinued the existing fertility control policy. Although Ayatollah Ruhollah Khomeini's fatva (direction) approved of birth control as long as it (a) does not hurt mothers and children and (b) excludes abortion, many family planning clinics which had been operating independently of the Department of Health were closed. In the Department of Health, family planning services were provided within the Family and School

Health Clinics, which had several other tasks besides the provision of family planning services alone. Further, as time passed, when contraceptive supplies ran out they were not replaced.

Following the end of armed conflict with Iraq, official views about population size changed in light of the short-term and long-term problems that loomed vis-a-vis a rapidly growing population. The Government was then faced with a large population demanding food, health services, education and employment. In February 1988, for the first time, the Prime Minister issued a statement to members of the Cabinet regarding the topic of population as an issue. In March of that year, a committee was organized in the Ministry of Plan and Budget, consisting mostly of economists in the Ministry and a few demographers from universities. Their task was to prepare for the organization of a population seminar in August 1988. To facilitate the work of the conference committee, the Prime Minister issued a memorandum to all government ministries to the effect that the Government of the Islamic Republic of Iran was reconsidering "the issue of population growth". During the conference, which was held for three days as scheduled, a number of people from government offices and universities participated and presented papers on various aspects of population. A very important resolution of the conference was that the rate of population growth in the Islamic Republic of Iran was high and this would have a negative effect on the welfare of the people. Hence, the participants strongly urged the Government to set up a family planning programme and integrate population factors in policy-making.

After the announcement of the various resolutions of that conference, the Secretary of Health, during a press conference, reiterated Ayatollah Khomeini's fatwa regarding family planning, and announced that for the first time in the Islamic Republic a family planning programme would be established. He considered "birth control" as a "destiny factor" for the country and publicly encouraged women interested in preventing unwanted births to get help in government health clinics and health houses around the country (Malek-Afzali, press release/Conference, 1988).

While the official commitment of the Government to a family planning programme was announced in August 1988, the actual programme was not established until 1989. In December 1988, the High Judicial Council announced that "family planning does not have any Islamic barrier". This opinion allowed the Secretary of Health to prepare for the family planning programme and order supplies of contraceptives in 1989 (Nikzad, press release/Conference, 1988). The Government became seriously committed to the family planning programme in 1989 when the Prime Minister announced that "none of the government programmes (for development and the welfare of the people would) work without a serious family planning programme". He explicitly referred to the need for a serious solution to population problems and referred to numbers and figures as alarming for the future (Moosavi, 1989). The family planning programme that was announced in December 1989 has three important goals: (a) encouraging the spacing of birth with 3-4 years between pregnancies, (b) discouraging pregnancies among women below age 18 and over age 35, and (c) limiting the total number of children per family to three (Kalantary, 1989).

Political and financial commitment to the family planning programme has increased since 1989. At all levels and in all branches of Government, the size of the population is seen as a serious bottle-neck, especially in terms of the country's future development. A lot of publicity has been given to the importance of limiting the number of children to two or three and increasing the quality of children. Government officials, religious leaders and special television programmes by religious figures have reinforced and promoted the concepts of family planning and birth control, and fostered the idea of a "quality population". Further, new directions in population policy have included negative incentives for families with more than three children. The Assembly of Representatives (majles) recently approved a law regarding public benefits for couples having their fourth child; the law went into effect in 1994. Accordingly, the parents of the fourth child from then on would not receive certain government benefits, such as paid leave for mothers about to give birth. It is not clear if this law will include benefits such as food supplements and health benefits available to low-income women through maternal and child health clinics. However, the most important aspect of the new law is not so much the implementation of strict disincentives but their symbolic meaning: their existence implies that the Government considers population policy to be a very serious matter.

There has been strong encouragement for male and female sterilization. Pills and condoms are being made available free of charge to eligible women. Even the relatively new contraceptive methods such as Norplant and the injectable contraceptive Depo-Provera are being made available. The number of clinics and health houses providing family planning services have increased to 400 across the country (Assadpoor, 1992). Rural health centres have been increased extensively starting from 1993 (Namaki, 1993). The purpose of these centres is to provide family planning services along with general health care services. The programme gives strong emphasis to male sterilization "as a safe method with no physiological or psychological side-effects" (Malek-Zadeh, 1991a). To further promote this part of the programme, plans call for the training of general practitioners to carry out male sterilization (Assadpoor, 1992).

It is clear that financial commitment to the family planning programme has increased significantly in the Islamic Republic of Iran. In 1989, when the programme first began, no specific budget was provided for family planning activities. There has since been reference to financing the programme from different sources. For example, in January 1992, it was announced that the President had provided the programme with an extra Rls 50 million (almost US\$715,000 using the official exchange rate at the time). By 20 March 1991, more than \$17 million had already been spent on the programme (Khazi, 1992). Another sign of the Government's commitment to the programme is that by 1992 the position of under-secretary was established so that the activities of the family planning programme could be coordinated within the Ministry of Health and with other Ministries.

Patterns of contraceptive use

This section analyzes the results of two surveys: the 1976-1977 Iran Fertility Survey (IFS) and 1992 Contraceptive Prevalence Survey. The 1977 IFS collected contraceptive use information at the peak of family planning programme activities during the 1970s. This was a nationally representative sample survey of ever-married women in which 6,066 households were interviewed (see Aghajanian and others, 1993, for a detailed description of the survey and evaluation of the data). The IFS provided information about knowledge and use of contraception among ever-married women in 1976.

The 1992 Contraceptive Prevalence Survey was carried out by the Ministry of Health. Using a cluster sampling system, 36,000 currently married women were interviewed in June 1992. This is a remarkably large sample survey for the Islamic Republic of Iran and a great accomplishment for the programme's under-secretary. That Survey collected data about contraceptive knowledge and use in addition to gathering information on recent fertility.

Knowledge of contraceptives

IFS data reveal that the pill was the most widely known contraceptive among Iranian women in 1976 (for detailed tabulations of contraceptive practice data in that year, see Aghajanian, 1992). About 85 per cent of women mentioned that they had heard of the pill. The next best known contraceptive method was the condom, which was referred to by 46 per cent of the women interviewed. A slightly smaller percentage of women referred to the IUD. As for traditional methods, conventionally considered less efficient than the modern methods, withdrawal was the best known. About 38 per cent of the women referred to this method.

The 1992 Contraceptive Prevalence Survey showed a very high level of awareness about contraceptives. Over 90 per cent of the respondents had knowledge of at least one method of contraception, and more than 70 per cent of them approved of family planning.

Current contraceptive use

Table 3 summarizes data related to current contraceptive use among currently married women in 1976 and 1992. In 1976, about 35.9 per cent of all currently married women were using contraceptives. After the revival of family planning in the Islamic Republic, 64.6 per cent of women reported using some type of contraceptive in 1992. This figure is almost twice as great as the figure for 1976.

In 1976, there was a wide gap in the level of contraceptive use between rural and urban areas. In urban areas, about 54 per cent of currently married women used contraceptives; in rural areas, the figure was less than 20 per cent. By 1992, this wide gap between use in rural and urban areas had declined. In rural areas, 61 per cent of currently married women reported using contraceptives. Compared with 1976, this is an increase of 40 percentage points. In urban areas, 73 per cent of currently married women reported using contraceptives, an increase of 22 percentage points over 1976. While the level of contraceptive use in both rural and urban areas is high, there is still a 14 percentage point gap between rural and urban areas.

A positive relationship between literacy and contraceptive use existed in 1976 and in 1992. Contraceptive use was common among 40 per cent of literate married women in 1976. This figure increased to 73 per cent in 1992, showing an 82 per cent increase. With regard to illiterate women, the increase is from 25 per cent in 1976 to 52.6 per cent in 1986. In 1992, over 50 per cent of illiterate married women used contraceptives compared with only 25 per cent in 1976.

The number of living children is an important factor in relation to contraceptive use. The higher the number of living children, the higher is the probability of a couple using contraception to limit family growth. Table 3 reports the percentage of married women with four or more living children who used contraceptives. In 1976, 41 per cent of married women with four or more children were using

contraceptives. In 1992, about 73 per cent of women with four or more children were doing so. In urban areas, 81 per cent of women with four or more living children used contraceptives. Similarly, in rural areas, 61 per cent of women with four or more children used contraceptives. These data indicate the fertility-limiting behaviour of Iranian couples. As for married women with three or fewer children, in urban areas about 60 per cent of them used contraceptives. This high rate of use among women with three or fewer children indicates the level of contraceptive use in urban areas for spacing purposes. This pattern is apparent from the high use rate among young women, 15-19 years old, in urban areas (table 3).

Table 3: Determinants of current contraceptive use among currently married women in the Islamic Republic of Iran, 1976-1992

Variable	Percentage currently using contraception	
	1976	1992
Place of residence		
Urban	53.8	74.1
Rural	19.9	51.5
Woman's literacy		
Literate	40.4	73.2
Illiterate	25.3	52.6
Age at time of survey		
15-19 years	16.5	34.4
20-34 years	31.4	64.4
35+ years	41.4	70.9
Number of living children		
Nationwide		
3 or fewer children	31.2	56.9
4 or more children	41.1	72.5
Urban		
3 or fewer children	49.8	69.6
4 or more children	56.1	81.0
Rural		
3 or fewer children	10.4	39.3
4 or more children	27.9	60.8
All currently married women	35.9	64.6

Contraceptive methods

In 1992, the pill was the most frequently mentioned contraceptive method being used in the Islamic Republic of Iran (figure 2); over 35 per cent of those practising contraception used oral pills. The second most popular contraceptive method was the traditional one of withdrawal, which was being used by almost 35 per cent of the respondents. Female sterilization, IUD and condom were at similar levels of use. As shown in figure 2, there is a marked difference between rural and urban women in terms of the method of contraceptive use. In rural areas, the pill is by far the most popular method. By contrast, withdrawal is most popular traditional method in urban areas.

Figure 3 shows the methods of contraception by the literacy of women. It is clear that for literate women there is very high use of withdrawal compared with illiterate women. The pill is more popular among illiterate women compared with literate women. Literate women are more likely to report the use of condoms and IUDs than illiterate women, among whom there is a greater probability of having been sterilized. However, the number of literate women whose husbands had undergone a vasectomy is quite limited.

There are some differences in contraceptive method by age, as shown in figure 4. Very young women (15-19 years old) use withdrawal. They are basically interested in postponing births; they are not worried about using this traditional method, even though it is not entirely reliable. The pill is used by women of all ages, but more so among those 20-34 years old. Women older than 34 years have a good chance of getting a tubectomy or their husband a vasectomy. The use of condoms and IUDs are more popular among women 20-34 years old.

Impact of family planning

The new family planning programme has been in effect only for a few years, so there are really not enough data to evaluate its effectiveness. None the less, some speculation can be made based on the data about knowledge and use of contraceptives presented in the previous section. It is clear that knowledge and use of contraception extends much beyond the relatively small number of urban educated women who limited their fertility in the 1970s. Regional differences in contraceptive use have declined; the practice of contraception has spread to rural and illiterate women. This is a significant accomplishment compared with the situation that existed under the family planning programme operating during the 1970s.

No data are available to measure the number of births this programme has averted either since its inception or in recent years. The Ministry of Health evaluates the impact of family planning through population surveys focusing on vital events. According to the latest survey, which was carried out in March 1993, the TFR is reported as 3.6 children per woman, with the crude birth rate being 27 per thousand population. Thus, current total fertility is remarkably lower than the rate of 7.0 births per woman calculated from the 1986 census (Aghajanian, 1991b). Similarly, the crude birth rate reported for 1992 is almost 43 per cent less than that of 1986.

Another indication of the impact of the family planning programme is the results of the 1991 population survey, which enumerated a population of 55.8 million (Iran Statistical Center, 1992). Accordingly, the Iran Statistical Center reported an average annual population growth rate of 2.5 per cent for the five-year period 1986-1991. This is a significantly lower growth rate compared with the period 1976-1986 when the growth rate was at least 3.4 per cent - one of the highest rates in the ESCAP region. Data from the Vital Statistics Bureau also show a decline in the number of births registered between 1989 and 1991. In 1989, a total of 1.7 million births were registered; the 1991 figure was 1.5 million (Iran Statistical Centre, 1992).

Although the reported decline in TFR, the population growth rate and the number of registered births are all clues to a decline in the birth rate, the decline may not be due entirely to the effectiveness of the family planning programme. Rather, a postponement of marriage in recent years accounts for a large part of this decline. Economic factors such as the high cost of housing, the high rate of unemployment and inflation have resulted in an increase in the female age at marriage in recent years. Table 4 shows the proportion ever-married among the female population 15-24 years of age and the singulate mean age at marriage for 1986 and 1991. From this table it is clear that the mean age of marriage for women has increased significantly during that five-year period. The proportion ever-married among women 15-19 years of age decreased from 33.5 per cent in 1986 to 25.5 per cent in 1991. Similarly, for women in the age group 20-24 years, the proportion ever-married decreased from 73.6 per cent in 1986 to 67.1 per cent in 1991. As a result, the singulate mean age at marriage has increased from 19.8 years in 1986 to 21.1 years in 1991, an increase of almost 7 per cent in the age of marriage for women.

Table 4: Changes in percentage of women ever married at ages 15-19 years and 20-24 years, and changes in female singulate mean age at marriage: Islamic Republic of Iran, 1986-1991

Year	15-19 years		20-24 years	
	Percentage ever married	Change (%)	Percentage ever married	Change (%)
1986	33.5	-	73.6	-
1991	25.5	-23.0	67.1	-8.8

Another factor that has contributed to a decline in the birth rate by 1992 is the decline in exposure to current fertility. This is measured by the proportions of women of childbearing age who were married in a given year. These data are reported in table 5. The most important pattern of change for the period 1986-1991 shown in table 5 is a decline in the proportion of currently married women: a decrease from 72.4 per cent in 1986 to 70.2 per cent in 1991 for all women aged 14-49 years. The extent of the decline in the proportion married is also shown separately for the country's rural and urban populations. In urban areas, the proportion of married women declined from 72.9 per cent in 1986 to 71.2 per cent in 1991.

Table 5: Percentage currently married among female population 15-49 years, Islamic Republic of Iran: 1986-1991

Age	Percentage currently married			
	Total	Urban	Rural	
	1986	1991	1986	1991

15-19	33.2	25.1	31.8	24.2	34.0	25.9
20-24	72.6	66.3	73.9	66.1	73.8	66.5
25-29	90.0	86.1	87.1	85.6	89.8	87.0
30-34	92.1	92.0	91.5	91.4	93.5	93.3
35-39	92.2	93.1	92.2	92.5	94.0	94.2
40-44	90.1	91.6	91.2	91.0	92.4	92.7
45-49	83.7	89.0	88.5	87.0	89.3	90.5
15-49	72.4	70.2	72.9	71.2	73.3	68.8

Source: Calculated from 1986 census and 1991 population survey.

Discussion and conclusion

An official family planning programme was begun in April 1967, the objective of which was to promote the "physical, mental, social and economic welfare of families and in consequence that of society". The ultimate goal of the programme was to reduce the country's annual population growth rate to 1 per cent within 20 years. While the programme was successful to some extent, the goal was unrealistic. By 1977, at the programme's peak, only 11 per cent of women of reproductive age were covered by the programme. Analysis of data from the Iran Fertility Survey of 1976-1977 suggests that, while women had an extensive knowledge about contraception, the use of efficient contraceptives was only moderate. Inconsistencies in contraceptive behaviour and family-size desires were prominent among older, less educated village women who had given birth to more than four children. Rural-urban differences in all aspects of contraceptive knowledge and behaviour were striking. It was the better educated urban women who resorted to family planning, favouring the pill among the more efficient methods. It was the less educated rural women who had never used contraceptives and who never intended to do so in the future.

After a slow-down - perhaps more precisely an almost complete halt - in the programme for about eight years, the Government of the Islamic Republic of Iran revitalized the family planning programme. The results of the 1986 census had been viewed with alarm when they were announced, so in 1989, a family planning programme was established. With strong political ideological and economic support, this programme has been growing quite satisfactorily ever since.

While only four years have passed since the establishment of the new programme, there are strong indications that the level of contraceptive use is increasing and spreading across rural areas as well as urban areas. Knowledge about contraceptives seems to be widespread, and the use of effective methods such as female sterilization is increasing significantly. The programme is being referred to as one of the world's most successful ones. Dr. Nafis Sadik, Executive Director of the United Nations Population Fund (UNFPA), recently suggested that the programme of the Islamic Republic of Iran be used as a model for other Muslim countries to follow (ESCAP, 1995).

A number of factors account for the relative success of the family planning programme in the Islamic Republic of Iran and these have policy and programme implications for other Muslim countries. These factors should be viewed at the family level as well as at the societal and ideological levels. While contraceptive supplies and services had been stalled at the government level for some years, there is no doubt that at the family level there was an increasing demand for contraception. This was mainly due to the continuous increase in the child survival rate during the 1980s and its recent acceleration to the point where infant mortality is estimated to be 33 per thousand live births (Namaki, 1993). At the same time economic pressures at the family level have been increasing owing to the high rate of inflation and unemployment. These two factors have sustained the demand for contraception at the family level.

At the societal level, the role of Government did not end with the resumption in the supply of contraceptives and related services, but it intensified with commitment and continuous support. Once the programme started, the Government showed strong commitment to the implementation of its population policy to reach its desired goals and objectives. Concern over the negative impact of population growth has been shared by various members of the rank and file of Government. Yet the most important aspect of this new programme's success is the interest, support and guidance of religious leaders. Such support has been nurtured in the context of the flexibility of Islam in dealing with social issues. Once the issue of high population growth was identified as a threat to the welfare of the family as a unit and the population as a whole, it was discussed as a problem with the highest Muslim authority (at the time Ayatollah Khomeini) who, after considering the issue, suggested solutions within the context of his knowledge of Islam and issued a fatwa concerning this matter. There is no doubt that the Ayatollah Khomeini's fatwa and its reiteration at various times and by various members of Government provided a powerful boost for the

family planning programme. The fatva made the issue more a matter relating to the common person and an issue to be considered by all groups and classes rather than a select group of highly educated urban women as in the past. This aspect of family planning in the Islamic Republic of Iran has significant implications for other Muslim countries dealing with population issues. Among those populations where Shi`at Islam is the main sect, the Ayatollah's fatva can be easily adopted and supported by the Shi`at Faqih (the highest body of religious leadership). This would be consistent with the adoption of other political views and issues among Shi`at populations in other countries. However, it is obvious that a large number of Muslim countries are populated with people belonging to other sects of Islam. Yet, in all these countries regardless of the particular sect concerned, the aforementioned fatva would play a very important role in determining the views, attitudes and practices of common men and women. Based on the experience of the Islamic Republic of Iran, the process of obtaining a fatva from the Faqih seems to be especially relevant for the promotion of family planning among that cross-section of society in such countries.

Continued support from the religious authority (Faqih), the Government's strong commitment and the demand for contraception at the family level should result in further success for the new family planning programme in the Islamic Republic of Iran. However, considering the role of the programme in reducing the birth rate in the future, one has to realize the demographic challenge posed by the still high population growth rate and the existence of almost 17 million women in the reproductive age group. As such the goal of reducing the annual population growth rate to 1.8 per cent per year in only five years - during the Islamic Republic's Second Five-Year Plan - seems very ambitious indeed.

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Contraception among Adolescents in Bangladesh

By M. Mazharul Islam and Mamun Mahmud

The authors of this article are M. Mazharul Islam, Associate Professor, and Mamun Mahmud, research student, both in the Department of Statistics, University of Dhaka, Bangladesh.

Frequent visits by family planning workers greatly improve the contraceptive use rate among adolescents

Although contraceptive prevalence among currently married women of reproductive age is increasing rapidly in many developing countries, the rates have not yet reached those of developed countries. The level of contraceptive use in most developing countries is higher among women in their thirties and, typically, lowest among teenage women and women in their forties (United Nations, 1987). Studies in developed and developing countries demonstrate that the behavioural patterns of contraceptive acceptance and use differ significantly between adolescents (females approximately 10-19 years of age) and adults (women 20-49 years) (United Nations, 1989). This difference may be attributed to the maturity, greater knowledge and experience of adults compared with adolescents.

Such considerations as desired family size and child-spacing influence contraceptive prevalence among married women at the individual level, while at the macro level, laws and regulations and cultural mores are important factors that determine access to contraception. Some laws relate specifically to female teenagers. Both married and unmarried adolescents face the added obstacles of legal or cultural restrictions which limit their access to family planning services. However, unwanted pregnancies resulting from lack of contraceptive use have led to an increasing number of abortions among young women. In many parts of the world, despite the fact that young women are often denied access to legal abortion services, both the number and the proportion of abortions performed for young women have been increasing over time.

Aside from external influences at the socio-cultural and policy levels that affect an adolescent's contraceptive behaviour, factors which vary at the individual level are also important, such as whether or not contraception occurs within a stable relationship, and whether or not either partner has had previous experience with contraception.

Although the contraceptive use rate is gradually increasing in Bangladesh, it is still very low compared with any developed country and many developing countries. Since the average age at marriage (14.8 years) in Bangladesh remains one of the lowest in the world, a large proportion of the potential acceptors of contraception are married adolescents.

The adolescent phase of human life is often termed as a very "demographically dense" phase because more demographic actions occur during these years than at any other stage of life.

Unfortunately no exclusive and comprehensive study on the contraceptive behaviour of married adolescents in Bangladesh has been undertaken; therefore, in view of the importance of this matter, an attempt has been made in this study to investigate their contraceptive behaviour. For comparison purposes we consider the contraceptive behaviour of married adults along with that of adolescents.

The study population

Bangladesh's population of 118 million (ESCAP, 1994) live in the comparatively small area of 144,000 square km, which makes Bangladesh the most densely populated country in the world (755 persons per sq. km). The country is also characterized by a high population growth rate (2.2 per cent annually), although there is evidence of some decline in recent years (Amin and others, 1993). A recent fertility survey in Bangladesh (BFS, 1989) revealed a total fertility rate (TFR) of around 5.0 births per woman, which is quite high by any standard (Huq and Cleland, 1990). This high fertility is characterized by high nuptiality, low age at marriage and a low contraceptive use rate (Islam and Islam, 1993).

Traditionally, childhood marriage and early childbearing are encouraged in Bangladesh.

There has long been strong social pressure for the preservation of virginity until marriage, which is a cultural characteristic of the great majority of people in Bangladesh irrespective of their religion (Maloney and others, 1981). Religion has a strong influence on early child marriage. The majority of Bangladeshis who are Muslim (about 85 per cent of the total population) think that girls should be married immediately after menarche. Sex outside marriage occurs only seldomly since premarital sex is looked down upon harshly in Bangladeshi society.

Marriage is almost universal in Bangladesh. By age 35, almost 100 per cent of females have been married. Bangladesh Fertility Survey (BFS, 1989) data suggest that 96 per cent of ever-married women were married when they were teenagers (Islam and Islam, 1993; Mahmud, 1994). This gives rise to a very low average age at first marriage in Bangladesh, i.e. only 14.8 years. Several studies conducted in the 1960s and 1970s also reported very low age at marriage (Obaidullah, 1966; Sadiq, 1965; Khuda, 1978). During the period 1975-1976, the mean age at marriage among all ever-married women in Bangladesh was reported to be 12.3 years (BFS, 1975).

Adolescent fertility contributes substantially to overall fertility in Bangladesh, accounting for about 18 per cent of the total number of births (Huq and Cleland, 1990). The adolescent fertility rate, measured as the number of births per thousand women aged 15-19 years, was observed to be 239 per thousand in Bangladesh, whereas it is only 7 per thousand in the Republic of Korea, 35 per thousand in Sweden, and 44 per thousand in the United Kingdom of Great Britain and Northern Ireland (UN, 1988). This variation in the levels of adolescent fertility may be attributed largely to differences in the age at which women marry and the extent to which young married couples use contraception.

Data and methodology

The data for the present study are taken from the 1989 BFS. The survey was conducted during the period December 1988 to April 1989, on behalf of the Government of Bangladesh by the National Institute of Population Research and Training (NIPORT), with funding from the World Bank. The details of the survey are available elsewhere (Huq and Cleland, 1990).

Although there are marked variations in the definition of the term adolescent, with diverse age ranges in different studies, we consider as adolescents young married females, ranging in age from 10 to 19 years, which is the definition also suggested by the World Health Organization (WHO).

It should be mentioned here that the 1989 BFS was not designed especially for adolescents; however, it collected information through a nationally representative sample of 11,906 ever-married women under 50 years of age. That sample consisted of both adolescent and adult women. Such a large data set provides a unique opportunity to study various aspects about adolescents along with adults as a comparison group.

The sampling frame for the survey considered all households in Bangladesh. From these, national probability samples of 11,729 households were selected, and 11,236 of them were successfully interviewed. Among the 11,236 successfully enumerated households, a total of 12,096 ever-married women aged under 50 years were identified as eligible for individual interview. Of these, 11,906 women were successfully interviewed; these constituted our reference population. Among the 11,906 ever-married women, 11,484 of them (96.4 per cent) were married before age 20. Of that number, 1,922 (16.1 per cent) were currently under age 20 at the time of the interview; these we considered to be adolescent for the purpose of our study.

Results and discussion

Knowledge of family planning

Usually knowledge of contraceptive methods refers to whether the respondent had heard of or knows of a family planning method. In the 1989 BFS, data on knowledge of family planning methods were collected through a series of questions by following what is popularly known as the "recall and prompting" procedure (WHS, 1980). The main purpose of the questions on knowledge was to define for the respondent exactly what is meant by contraception or family planning. In this study, in computing the indices, overall knowledge is taken into consideration by combining prompted and unprompted knowledge (also called spontaneous knowledge).

Table 1 presents the percentage of adolescent and adult women who were aware of any contraceptive method. It shows that knowledge of contraceptives is almost universal among both adolescents and adults in Bangladesh. Almost all the adolescents and adults interviewed were aware of certain family planning methods. However, it is obvious that knowledge of various methods of contraception does not imply that the respondents actually knew how to use these methods effectively. It is evident from table 1 that almost all married women (whether adolescents or adults) are generally aware of the oral pill and female sterilization. Male sterilization is the next best known method, followed by condoms, injectables and IUDs.

Table 1: Percentage of adolescent and adult women who are aware of contraceptive methods

Contraceptive methods Percentage aware of method

Contraceptive methods Percentage aware of method			
	Adolescents	Adults	All
Pill	98.6	98.7	98.6
IUD	72.7	79.0	78.0
Injectable	79.5	80.7	80.5
Foam	23.5	24.3	24.2
Condom	82.4	83.6	83.4
Sterilization			
Female	97.7	98.4	98.3
Male	84.8	87.8	87.3
Withdrawal	20.7	31.8	30.0
Safe period	35.7	47.4	45.5
Abstinence	26.3	37.5	35.7
Others	3.2	5.1	4.8
Total			
(Any method)	99.5	99.6	99.6
N	1,912	9,947	1,1859

Among the adolescents, 82.4 per cent reported that they had knowledge of condoms as opposed to 83.6 per cent of the adults, whereas for knowledge of male sterilization, the figures were 84.4 per cent and 87.8 per cent, respectively. Awareness of IUDs was lower among the adolescents (72.7 per cent) than their adult counterparts (79.0 per cent). It is interesting to note that, although awareness about modern contraceptive methods, in general, was slightly lower among the adolescents than among the adults, the difference was wide with regard to traditional methods. This situation indicates that knowledge about contraceptive methods is slightly lower among adolescents than adults in Bangladesh.

Ever use

The term "ever use" refers to the use of a contraceptive method at any time before the date of interview without making any distinction between past use and current use. Any respondent reporting that she or her spouse had ever used some form of contraception was counted as an ever user regardless of the time of use. Also, an ever user might have used more than one method.

Whereas knowledge was almost universal among both adolescents and adults, only 26.3 per cent of the adolescents and 48.4 per cent of the adults reported that they had ever used any contraceptive method (table 2). Thus, the contraceptive ever-use rate among the adolescents surveyed was slightly higher than half that of the adults. Among the modern methods ever used by the adolescents, oral pills accounted for the highest percentage (15.3 per cent), followed by condoms (6.2 per cent). Thus, experience with oral contraceptive pills was found to far exceed experience with any other method.

A small proportion of other modern methods was also used by adolescents. However, the most surprising aspect of the ever use of contraceptive methods is that traditional methods comprised a significant proportion of ever use of contraception. Among the traditional methods, the "rhythm" or "safe period" method (6.3 per cent) was the most popular; it held the second position in terms of ever use. It should be mentioned here that adult females also showed the same pattern of method-specific ever use of contraceptive methods. But the most striking feature is that female sterilization was the second most used modern method by adults. Among the adults, about 10 per cent of the females were ever-sterilized. Use of this method was negligible among the adolescents (only 0.2 per cent). The pill was also the most frequently tried modern method (23.2 per cent) by adults, followed by female sterilization (10.2 per cent), condom (6.5 per cent), IUD (4.2 per cent) and injectable (2.0 per cent). Among the traditional methods, the safe period was also the most popular method (13.7 per cent) ever used by adults.

Table 2: Percentage of adolescents and adults who have ever used specific contraceptive methods

Contraceptive methods Percentage of ever use

Contraceptive methods	Percentage of ever use			
	Adolescents	Adults	All	
Pill	15.3	23.2	21.9	
IUD	1.2	4.2	3.7	
Injectable	0.8	2.0	1.8	
Foam	0.3	1.3	1.1	
Condom	6.2	6.5	6.5	
Sterilization				
	Female	0.2	10.2	8.6
	Male	0.3	1.6	1.4
Total modern		16.9	27.2	25.5
	N	324	2,717	3,042
Withdrawal		3.8	7.7	7.0
Safe period		6.3	13.7	12.5
Abstinence		1.2	5.1	4.5
Others		0.5	1.9	1.7
Total traditional		6.2	11.8	10.9
	N	119	1,178	1,293
Total				
	(Any method)	26.3	48.4	45.0
	N	506	4,832	5,342
Overall total		1,922	9,984	11,906

Current use

The term "current use" refers to the method that was being used by an individual client at the time of the survey. Thus, any respondent (or her spouse) using a family planning method at the time of survey was regarded as a current user.

Table 3 summarizes the current level of contraceptive use among the adolescents and adults who were currently married. The results indicate that the contraceptive prevalence rate (CPR) is only 15.3 per cent among adolescents, i.e. out of the 1,820 currently married adolescents, only 279 of them were currently using any method of contraception, including traditional methods. The 15.3 per cent CPR can be broken down further as 10.7 per cent for modern methods and 4.6 per cent for traditional methods. The corresponding CPR for adults and for the country as a whole are 34.4 per cent and 31.4 per cent, respectively. Thus, the observed CPR for adolescents is less than half that observed among adults.

Among individual methods, the pill accounted for the highest use (6.7 per cent), followed by the safe period (2.7 per cent), condom (2.1 per cent) and withdrawal (1.5 per cent). IUDs, injectables and sterilization were the least commonly used methods among adolescents. In contrast, among adults, female sterilization was the most common method (10.5 per cent), followed by the pill (9.9 per cent), safe period (4.5 per cent) and withdrawal (1.9 per cent). An important feature is that the condom is a more popular method among adolescents than their adult counterparts.

It is interesting to note that traditional methods accounted for a substantial proportion of the contraceptive prevalence rate for both adolescents and adults. For adolescents, traditional methods accounted for one-third of the total use, while for adults they accounted for one-fourth of total use. The results indicate that adolescents are relying more on less efficient traditional methods and modern reversible methods than adults. This finding deserves special attention by family planning programme managers.

Table 3: Percentage of adolescents and adults using any specific contraceptive method

Contraceptive methods Percentage currently using

Contraceptive methods	Percentage currently using		
	Adolescents	Adults	All
No method	84.7	65.4	68.6

Pill	6.7	9.9	9.4
IUD	0.8	1.5	1.4
Injectable	0.6	0.7	0.7
Foam		0.1	0.1
Condom	2.1	1.6	1.7
Sterilization			
Female	0.2	10.5	8.8
Male	0.3	1.4	1.2
Total modern	10.7	25.7	23.3
N	195	2,348	2,543
Withdrawal	1.5	1.9	1.8
Safe period	2.7	4.5	4.2
Abstinence	0.2	1.3	1.2
Others	0.2	1.0	0.9
	4.6	8.7	8.1
N	84	791	883
Total			
(Any method)	15.3	34.4	31.4
N	279	3,143	3,424
Overall total	1,820	9,087	10,907

Perceived attitude of others towards contraception

To gain knowledge about perceived attitudes towards contraception, respondents were asked whether their husbands, older family members and female friends and neighbours approved or disapproved of family planning. The results, based on the responses of all currently married women, are shown in table 4.

Of the three types of person, older family members were perceived by the respondents to be the most hostile to family planning. Among the adolescents, it was found that over one-fourth (28.6 per cent) of the currently married respondents reported that their older family members were not in favour of family planning, compared with only 17 per cent in the case of the husband and 10 per cent for female friends and neighbours. Nearly two-thirds (73.5 per cent) of these respondents reported that their husbands were in favour of contraceptive use, compared with 60.2 per cent in the case of older family members and 58.9 per cent of female friends and neighbours. It should also be noted that, of these three types of person, 11.1 per cent of the older family members were undecided compared with 9.5 per cent of husbands and 8.2 per cent of female friends and neighbours.

On the other hand, for adults the attitude towards contraception follows the same pattern as that of adolescents; little difference was observed in the perceived attitude towards contraception between adolescents and adults.

Table 4: Percentage distribution of adolescents and adults according to perceived attitudes to contraception

Opinion about FP method	Adolescents			Adults		
	Husband	Older family member	Female friends/ neighbours	Husband	Older family member	Female friends neighbours
Infavour	73.5	60.2	58.9	72.4	60.4	55.9
Not in favour	17.0	28.6	9.9	23.2	32.1	10.7
Some in favour	-	-	23.0	-	-	28.1
Don't know	9.5	11.1	8.2	4.4	7.5	5.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
N	1,922	1,922	1,922	9,985	9,985	9,985

Note: A dash (-) indicates a frequency less than 5.

Future intention concerning use

In view of the fact that a large proportion of adolescents and adults as well are non-users of contraceptive methods, it is important to investigate whether they have any future intention to adopt family planning methods in order to limit their fertility. To determine their future intentions, respondents were asked whether they intended to use any method to avoid pregnancy at any time in the future, and if yes, which method they would prefer. In response, 83 per cent of the adolescents and 58 per cent of the adults said that they did intend to use a family planning method in the future (table 5), although their current use rates were 15 per cent and 34 per cent, respectively. This indicates that adolescents have a higher potential demand for using contraception in the future. But it is not known whether this demand is for limiting their fertility at an older age when they will already have achieved their desired level of fertility, or whether it is to postpone or space the birth of a child.

Table 5: Percentage intended use of family planning method in the future among adolescent and adult mothers

Future method use	Adolescents	Adults	All
Yes	83.0	57.8	62.7
No	17.0	42.2	37.3
Total	100.0	100.0	100.0
N	1,345	5,606	6,951

With regard to the future choice of methods, more than 60 per cent of the adolescents replied that they would prefer oral pills as their contraceptive method (table 6). The next choice was an injectable contraceptive (25.7 per cent) followed by female sterilization (2.8 per cent), IUD (2.8 per cent) and safe period (2.0 per cent).

Table 6: Percentage of adolescent and adult mothers according to intended method-specific use of family planning method in the future

Contraceptive methods Intend to use in future

Contraceptive methods	Adolescents	Adults	All
Pill	60.8	49.2	52.0
IUD	2.8	4.1	3.8
Injectable	25.7	28.0	27.4
Foam	-	-	-
Condom	1.8	1.4	1.5
Sterilization			
Female	2.8	8.4	7.0
Male	-	-	-
Withdrawal	0.1	0.9	0.8
Safe period	2.0	3.8	3.4
Abstinence	0.4	0.8	0.7
Others	3.5	3.3	3.4

However, condoms were the least popular of the intended methods to be used. For adults, there was a similar pattern with regard to the future choice of methods, except that a higher percentage said that they intended to use female sterilization. This reflects the fertility-limiting attitude associated with older age.

Contraceptive use in relation to self-reported need

In this section, fertility preferences and contraceptive use are discussed jointly to analyze contraception in relation to need, namely the desire among adolescents and adults to avoid future childbearing altogether, or to postpone the next birth.

Table 7 shows the relationship between contraceptive use and self-reported desire to limit family size or

postpone the next birth. Among the adolescents who said they wanted no more children, only 29.4 per cent were practising contraception. This compares to a figure of 15.6 per cent for adolescents who said they wanted another child at some time in the future. Thus, "limiters" were found to be nearly twice as likely to use contraceptives as were the "spacers". This pattern is also true for the adults surveyed, but the rate is higher for them than the adolescents. The sharp distinction between "limiters" and "spacers" becomes more complex if the length of time that women wish to postpone the next birth is taken into account. Among the adolescents who said they wanted another child, the contraceptive use rate rose sharply from 6.5 per cent of those who wanted the next birth to 28.2 per cent for those who would prefer a delay of five or more years. Thus, this latter group of long-term "spacers" had a level of contraceptive use nearly as high as the "limiters".

There were two "undecided" groups in our study. The first such group comprises those who were undecided about whether or not they wanted another child. The women in the second group said they wanted another child, but were uncertain about when they wanted it.

In both groups, among the adolescents, the level of contraceptive use was very low, a pattern suggesting that indecisive attitudes about family size go hand in hand with behavioural indecision or inertia.

Table 7: Percentage of women using contraception according to their fertility preference

Fertility preference	Adolescents	Adults	All	No. of Respondents
Want no more/sterilize	29.4	43.9	43.6	5,960
Want more: (All)	15.6	21.1	17.3	4,575
Delay: 0-1 years	6.5	8.2	7.7	1,537
Delay: 2-4 years	21.4	29.1	26.1	1,495
Delay: 5 + years	28.2	38.0	34.4	663
Delay: Undecided	8.8	13.4	12.1	445
Delay: Pregnant	-	-	-	435
Undecided about future birth	10.1	10.1	10.0	371

Note: A dash (-) indicates less than 5 per cent.

Factors affecting current use of contraception

In this section, we used logistic regression technique to identify the factors affecting the contraceptive use rate among adolescents. Current use of contraception was made the dependent variable, which we dichotomised by assigning the value 1 if the respondent was using any method of contraception and 0 if she was not using any method. The explanatory variables were: place of residence, administrative division, husband's education, husband's occupation, respondent's participation in family planning decision-making, visits by family planning workers, availability of electricity in the household, and respondent's religion.

Table 8 presents an estimate of the logistic coefficients "B" corresponding to the selected explanatory variables, standard error of these estimates, and partial R and relative odds calculated for each category of the categorical variables.

According to the model, the following six variables appear as the significant predictors of current contraceptive use. These are: respondent's education, participation in family planning decision-making, visits by family planning workers, administrative division, husband's occupation and availability of electricity in the household. The rest of the explanatory variables, which were found to be not statistically significant at the final step of the stepwise selection, were: place of residence, husband's education, and religion.

Table 8: Logistic regression of current contraceptive use among adolescents on some selected socio-demographic characteristics

Variables	Coefficient (B)	St. error of coefficient	Partial R	Odds ratio
Respondent's education	-	-	0.112	-
(No school)	-	-	-	1.000
Primary	0.586 * *	0.170	0.083	1.797

Higher	0.933 * *	0.222	0.106	2.543
Family planning decision (Husband)	-	-	-	-
Joint	0.591 * *	0.179	0.079	1.805
Visit of family planning worker (Never)	-	-	-	-
Ever	0.464 * *	0.145	0.076	1.805
Region of residence (Chittagong)	-	-	0.074	-
Dhaka	0.757 * *	0.225	0.081	2.133
Khulna	0.708 * *	0.237	0.070	2.030
Rajshahi	0.791 * *	0.236	0.081	2.206
Husband's occupation (Labourer/farmer)	-	-	0.053	-
Land-owner/cultivators	-0.030	0.202	0.000	0.969
Professionals/sales/services/ production workers	0.426 *	0.189	0.023	1.533
Electricity in household (No)	-	-	-	-
Yes	0.474 *	0.207	0.048	1.607
Constant	-3.511	0.268	0.000	-
Model Chi-square:	107.184			
Degrees of freedom:	10			
Probability:	.000			

Notes: Reference category is in parentheses.

* * P < .01

* P < .05

From the results of the logistic regression analysis, it appears that education is the most important factor affecting the current use of contraception among adolescents. Large and statistically significant differences in contraceptive use by education level are observed despite having controlled for other variables. Adolescent women with an education level of secondary and higher were found to be 2.5 times as likely to practise contraception as those who had no education.

Participating in family planning decision-making is the second most important factor influencing the current use of contraceptive methods. Women who discuss matters relating to family size with their husband are likely to be current contraceptive users. Couples who make joint decisions regarding family planning were found to be 1.8 times more likely to be current users of any contraceptive method than those couples for which the husband alone makes such decisions.

The analysis further indicates that frequency of visits by family planning workers is significantly and positively related to current use of a contraceptive method among adolescent mothers. Adolescent mothers are more likely to use family planning methods when family planning workers visit them several times, than those who are not visited at all by family planning workers. In view of the likelihood that visits by family planning workers can motivate adolescents by providing them with counseling on family planning methods and by providing family planning services and disseminating supplies to achieve their widespread availability, frequent visits by family planning workers to an adolescent target group would be a valuable approach.

The results shown in table 8 indicate that region of residence also has a net significant effect on current contraceptive use among adolescents. Odds ratios for administrative divisions show that the chance of an adolescent in Rajshahi division being a contraceptive user was 2.2 times higher than that of her peer in Chittagong division. Similarly, chances were 2.13 and 2.03 times higher for adolescents in Dhaka and Khulna divisions, respectively, to be a user of contraception than those in Chittagong division. The factors that distinguish Chittagong from other divisions most clearly are cultural in nature.

Husband's occupation also has an effect on the behaviour of adolescent current users of contraceptives. Table 8 shows that the wives of husbands employed in sales, services or production sectors were 1.5 times more likely to practise contraception than are young wives of agricultural labourers or farmers. It also shows that the relative chance of a young wife being a contraceptive user if her husband is a land-owner is almost 0.97 times lower than an adolescent whose husband is working in the agricultural sector.

Because land-owners are usually characterized by low age at marriage, it is very likely that their contraceptive prevalence rate is also low, whereas the opposite is likely to be true among professionals who are characterized by high age at marriage and high contraceptive use.

The availability of electricity in the household of adolescents is an important variable; it contributes positively to the current use of contraception. The relative odds are found to be almost 1.61, indicating higher prevalence of contraceptive use among adolescents who have electrical power in their household, as compared with those having no such facility. The fact that having electricity in the household does improve the use of contraception among young women suggests that, with electricity, radio and television may be useful media for reaching such people with motivational messages and familiarizing young wives and their husbands with the use of contraceptives.

Conclusion and policy implications

In this study a limited attempt has been made to investigate some important aspects of contraceptive behaviour among young married adolescents in Bangladesh. The analysis shows that, although knowledge about contraception is nearly universal among married adolescents, there is a wide gap between knowledge and use of contraception. Slightly over one-fourth (26.3 per cent) of the married adolescents had ever tried any method of contraception and the current use rate was only 15.3 per cent. The corresponding figures for married adults were 48.4 per cent and 34.4 per cent, respectively. Low contraceptive use among married adolescents may be attributed to several socio-economic and cultural factors, such as education, religiosity, social conservativeness, husband-wife communication, occupation and economic condition. In addition, adolescents may face greater difficulties in obtaining contraceptive supplies and they may lack proper knowledge of the use of modern contraceptive methods. Studies have shown that low age at marriage in Bangladesh is directly related to poor socio-economic conditions and many cultural factors (Chaudhury, 1984; Ahmed, 1981). Most married adolescent females in Bangladesh are economically poor and uneducated; moreover, their status in the family and in society is very low. Because they are normally not very active economically outside the home, they have little say in decision-making in the family. In a recent study, Kamal and Slogett (1993) observed that social conservatism is partly responsible for low performance with regard to contraceptive use among women in Chittagong division. They also pointed out that women's mobility and their decision-making power in the family greatly determine their use of modern, responsible contraceptive methods. In another study, Rashid and Ali (1993) pointed out that it is cultural factors which inhibit women from adopting family planning, despite the fact that they have a high unmet demand for contraception.

The results of our study indicate that, despite wide-spread publicity about modern contraceptive methods, traditional methods account for a substantial proportion of contraceptive use among adolescents. Programme managers, therefore, should give due importance to this fact. There is evidence that, if correctly taught, correctly understood and consistently practised, traditional methods could be effective (Tietze and Potter, 1961; Tietze, 1968).

Among the factors determining contraceptive use among adolescents, education appears to be the most significant; education is positively associated with contraceptive use. Evidence suggests that education not only increases awareness of social mobility and creates a new outlook and rationalism among couples, but also reduces desired family size by raising desired living standards, bringing about a better understanding of the reproductive process, better knowledge about health care and access to modern and effective means of birth control.

The analysis shows that frequent visits by family planning workers greatly affect the contraceptive use rate among adolescents. Frequent visits by family planning workers and their counseling about family planning methods help to motivate adolescents to accept family planning methods and use them effectively. Such visits may also ensure that the supply of contraceptive methods for adolescents is adequate. The region of residence, religion and husband's occupation also appear to be significant factors determining the level of contraceptive use among adolescents.

Our study reveals that most of the obstacles to using family planning come from older family members and husbands. A relatively large proportion (28.6 per cent) of older family members were found to be still opposed to family planning. Our study also found that there is a great unmet demand for family planning

methods among adolescents. Among the adolescents who said they wanted no more children, only 29.4 per cent of them were currently using any method compared with 43.9 per cent of the adults.

The study contains a number of implications for policy purposes that could be useful in devising ways to increase the contraceptive prevalence rate among adolescents and thus bring about a further reduction in fertility in Bangladesh. These are as follows:

- Provide education to and create more employment opportunities for young women to increase their status in society;
- Create awareness among adolescents about the negative health, social and economic consequences of early marriage, early pregnancy and large family size. This could be done through special information, education and communication (IEC) campaigns, regular home visits by family welfare visitors (FWVs) and family welfare assistants (FWAs);
- Provide adolescents with information on the availability of family planning methods and their use-effectiveness;
- Improve the quality of care of reproductive health services and make them available at the door-step; and
- Devise programmes designed to overcome the resistance of husbands and in-laws.

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The Population of Persons with Disabilities in Pakistan

By Tauseef Ahmed

The author is with Pakistan's National Institute of Population Studies, Islamabad.

Improved collection and analysis of comprehensive and accurate data on the national disability situation is one of the policy categories mandated by the Agenda for Action of the Asia and Pacific Decade of Disabled Persons

Poverty is a major cause of disabilities. However, progress in social welfare of a society can be gauged from how well persons with physical and psychological disabilities are able to be rehabilitated so that they can become productive members of the population. It was for the purpose of drawing attention to this aspect of population development that Governments in the ESCAP region proclaimed the period 1993 to 2002 as the Asian and Pacific Decade of Disabled Persons. That action was followed later in 1992 by the Proclamation on the Full Participation and Equality of People with Disabilities in the Asian and Pacific Region, and the adoption of a related Agenda for Action (ESCAP, 1994a). These powerful mandates are aimed at helping developing countries such as Pakistan to adopt policy initiatives and programme actions that would improve the broad living conditions of the proportion of the total population that is disabled. In order for countries to plan specific rehabilitative programmes for persons with disabilities some basic elements are required, including valid data regarding types of disabilities, the ages of persons with disabilities, the causes of their disabilities and places of concentration. If the quality of the data is poor, the planning of rehabilitation programmes becomes a useless exercise. The collection and analysis of comprehensive and accurate data on the national disability situation is such an important factor that it is included as one of the basic policy categories in the Agenda for Action. Another prerequisite encompasses clarity in a society's perception of persons with disabilities: if those persons are viewed negatively, as a dependent burden for example, it will be difficult for that society to focus on the person, the human resource whose abilities can be developed to enable him or her to become a productive partner in the national development process. Thus, removal of the stigma attached to deformities etc., is another policy concern.¹ The seriousness with which a society handles issues related to persons with disabilities is reflected in the effort it puts into various stages of programme development and, more importantly, into assessing the quantum of and increase in disabilities, and the way disabled people are integrated within the development process.

The need for accurate data on the situation in Pakistan is apparent. For example, a comparison of the 1961 and 1981 population censuses would seem at first glance to show an alarming increase in the number of people with disabilities in Pakistan. However, compared with data from the 1973 Housing, Economic and Demographic Survey, the validity of those previously referred to data becomes doubtful. For instance, according to the 1981 census, out of every 1,000 households, about 30 could be expected to have one person with a disability; the 1961 census produced an estimate of about 19 (HAD, 1964). By contrast, according to the 1973 Housing, Economic and Demographic Survey (CO, undated), there were 115 persons with disabilities out of every 1,000 households. Do these data mean that there has been a dramatic rise in the disability rate in Pakistan? Hardly so, yet such wide variations in data would make one lose confidence in their credibility. In view of the unreliability of these data, what basis do we have for planning programmes to benefit persons with disabilities in Pakistan?

The paucity of reliable data regarding the prevalence of disabilities and the magnitude of the population with disabilities is quite well known. It is also well known that people are increasingly being disabled owing to malnutrition and disease, environmental hazards, natural disasters, traffic and industrial accidents, and various forms of conflict. Also as more of the population survives to older ages, the number of elderly people with disabilities is rising (ESCAP, 1994a). Thus, because valid and reliable data are essential for the development of a comprehensive plan for the welfare of those in the population with disabilities, this study highlights some of the dimensions that could invalidate or inhibit the reliability of information about this portion of Pakistan's total population and suggests measures for upgrading the quality of data on persons with disabilities. However, the current situation does not mean that special programmes are not undertaken to prevent disabilities. In the recent past, both the Government's expanded programme on immunization (EPI) and the oral-rehydration therapy (ORT) programme have been successfully implemented to control childhood diseases, especially polio and cholera and other diarrhoeal diseases, respectively. None the less, in order to assess the impact of these efforts and insure total coverage of the population on a national basis, accurate data are essential. Accurate data are necessary for the formulation of special programmes such as the one to introduce vitamin A to prevent blindness in rural areas, or the use of iodized salt in northern Pakistan to prevent goitre. Managers of such programmes need elaborate data on disabilities, the reasons for them, regions of concentration, and various socio-economic and demographic differentials. Thus, this study is divided into three major sections. Firstly, a sociological perspective of disabilities and their underreporting is provided; secondly, sources of data on disabilities and the problems connected with them are discussed;

and thirdly, a section is devoted to recommendations for improving the quality of the data needed for assessing this proportion of the total population.

Underreporting of disabilities: a sociological perspective

In traditional societies such as Pakistan where education is low and economic development has not taken off, any disability among household members is normally concealed, especially disabilities acquired from birth or those developed soon thereafter. Intellectual disabilities and physical deformities are perceived as stigmata since their existence could jeopardize the "family name", which becomes especially important in societies with extended families. The existence of any disability related to psychological concerns that results from congenital antecedents is considered a serious threat to a family's social status. The family's concern is related to the social discrimination that other people would likely demonstrate, which in the view of the family concerned justifies concealing the existence of such offspring.

Another reason why family events relating to disabilities are concealed relates to the "exchange" phenomenon in marriages, especially on the bridegroom's side. The fear that other children in the family concerned may also carry genes which could adversely affect their progeny means that parents often will not reveal that such a person exists in the family, since it would be difficult for them to find spouses for their other, non-disabled children. Such fears are much greater for families that are socially mobile or who have a relatively higher social status.

Persons with disabilities are also defined in sociological terms, according to the limitations the disabilities impose. Persons who cannot perform or fulfil socially recognized roles or do not have the potential or capability (intellectual or physical) for ever performing such roles may be referred to negatively as being "handicapped" (see footnote on p. 62). The stigma associated with such disabilities emanates from the fear of discriminatory behaviour from others, because of the inability of the person concerned to perform expected roles. The total dependence of such individuals on other family members for the performance of necessary social and other functions is an alternate explanation for the intensified fear of stigma and alienation exhibited by the family concerned. It is the absence of a social support system that would accommodate disabled persons' roles that intensifies the fear of stigma, especially when the disability is genetic or congenital. If persons with disabilities could perform the roles expected of them later in life after they have gradually assimilated the necessary skills to do so in the course of daily life, their presence in the household can be made known publicly. When such individuals are not considered a threat to the family's name and social status, or when the family feels it is appropriate to provide socialization of those persons beyond his or her own family circle, they may take their place in society.

Religion also plays an important role in identifying the status of disability. For instance, in more traditional societies, the occurrence of a congenital disability is often associated with superstition, the belief that extra-terrestrial influences caused the disability, which enables their existence to be rationalized, although for the individuals concerned, they are socially isolated and become objects of pity, if not fear and hatred.

In poverty-stricken developing societies where additional hands are always needed to assist with family work, thereby supplementing family income, the existence of a person with a disability is considered a curse or unfortunate fate for the family concerned. The loss of family labour in addition to the diversion of family resources to care for the needs of a child with a disability usually results in additional fertility to offset the loss of that child's potential contributions to family income. The assumed need for having additional children could lead to reproduction within a short interval to neutralize potential social pressure and possible social sanctions. In following this line of reasoning, the cause of the original congenital disability and the potentially adverse consequences of another pregnancy on maternal health are relegated to a position of lower importance than the need for reproduction.

In societies lacking social norms and institutions that should provide family support in terms of the socialization and rehabilitation of persons with disabilities, families are put under extra pressure owing to the heavy demands on their time to make up for this lack of support. The presence of a disabled person in a family is thus considered a life-long problem, because the person concerned is expected to remain always dependent on other family members for support. In addition, the person with a disability represents a loss of productive potential in terms of society. The social pressure to bear additional children who can help to support such disabled persons leads to enlargement of the dependent population. Further, in their haste to respond to social pressures, couples usually ignore the possibility of giving birth to yet other children with congenital disabilities. These attitudes are among the complex sociological perspectives involved in treating the subject of disabilities.

Data sources

In order to determine the level and pattern of disabilities in Pakistan, data at the aggregate level have been collected by censuses. The importance of the portion of the population with disabilities can be observed from the regularity with which data on this population have been collected since the time of the 1961 census. Prior to that time, no information existed on disabilities at the national level. In the population censuses of 1961 and 1981 and the Housing, Economic and Demographic Survey (HED) of 1973, information was collected on the census long form from a sample of households selected on a probability basis; this survey was conducted soon after the main census. All information on disabilities was recorded as reported, supposedly, by an adult living in the household, not necessarily the head of the household. However, these respondents, whether male or female, often had various biases with regard to reporting the incidence of a disability in the household, especially if the person(s) concerned were at younger ages, since the family could expect to attract social sanctions for revealing such facts. Moreover, information on the degree of disability was left totally to the discretion or perception of the respondent to reveal.

As mentioned previously, data on the cause of disabilities, treatment and rehabilitation, and economic activity of the persons with disabilities are necessary for programme planning purposes. Until the mid-1980s no source provided data on a number of other aspects regarding this portion of the population on a national scale. During the period 1984-1985, the Federal Bureau of Statistics (FBS) conducted a national survey to fill this data gap (FBS, 1986). Similar to a census, this survey also focused on household-level information collected on a quarterly basis. The survey concentrated on specific physical and intellectual disabilities that could place serious constraints on an individual's mobility for more than six months. Data on seven major causes of disability were collected: blindness, deafness, mutism, leprosy, retardation, lameness and "handicaps". A national sample of 5,638 households was surveyed to assess the incidence of these disabilities. Unfortunately the categories and definitions of disability were not consistent with those of the 1981 census, thus making it impossible to compare disability-specific rates.

In order to collect valid, in-depth information on disabilities, a special survey was conducted in the Islamabad and Rawalpindi districts in 1986 (DGSE, 1986). This pilot survey encompassed a comprehensive instrument through which individuals were first screened, and detailed information was asked on mental retardation, visual and hearing disabilities, physical disabilities in the form of paralysis, deformity and wasting of the limbs. Details were also collected about the cause and date of onset of the disability. The advantage of this survey was the employment of professionals who physically verified the data and staff highly trained to enumerate a simplified questionnaire with close supervision.

Identification of problems and issues

Definitional issues

The physical disabilities that were enumerated in the 1961 census included blindness, deafness, mutism and physical deformity (HAD, 1964). Interviewers were instructed to classify a person as blind if that person could not count the interviewer's fingers from a distance of 30 cm; physical deformity was defined as one or more limbs being permanently non-functional. Persons with both hearing and speaking disabilities were likewise enumerated.

During a census enumeration, there are several instances when persons with disabilities can be omitted. For example, not all persons with disabilities are seen or examined personally by the enumerators; thus, the respondent's subjective judgement about such persons would play an important role in reporting the degree of hearing and speech impairments, or ability to use one's limbs etc. Further, even if such a person could see blurred images, if he or she were totally illiterate, this could complicate matters further.

The 1973 HED survey added an additional category: "other handicap", which despite being quite vague could still account for the reporting of physical disabilities. It was only in the 1981 census that questions were asked about and answers recorded on both physical and mental disabilities: blindness, deafness and mutism, physical deformity or inability to walk, mental retardation, "insanity" and "other handicap".

Mental disorders included disabilities acquired at birth, whereas the term "insanity" could indicate a psychosocial disability, or a condition which prevents a person from carrying out everyday tasks. The addition of this information in the data collection process basically removed some of the ambiguity involving the concept of disability; in addition, it reflected the Government's growing interest in examining the status of population quality, especially in terms of mental health. Although the Government's concern about collecting valid information is genuine, the way this sensitive data is collected has been very casual. Dependence on the respondent's perceptions and judgement in defining mental disabilities plays a major role in such data collection. Therefore, temporary or mild mental illness is not differentiated from permanent and serious disorders such as paranoid schizophrenia. Such a "snap-shot" of mental quality encompasses a vast variety of emotional or psychological disorders, none of which is discussed openly in Pakistani society. Both factors

have negatively affected reporting of the incidence of mental disabilities. For instance, unless respondents are asked about the duration and intensity of the mental illness, the exact nature of the condition that renders individuals disabled cannot be determined with any degree of accuracy.

In the 1984-1985 survey of persons with disabilities, the definitions of blindness included temporary blindness, and that of deafness included partial deafness (FBS, 1986). Such definitions were loose and relaxed as compared with those of the 1981 census (PCO, 1984). The enumeration also depended heavily on the respondent's judgement without considering his or her potential for bias. However, for the first time, the survey revealed national-level data on leprosy and physical deformity as well as physical and mental retardation.

Although the Islamabad/Rawalpindi pilot survey obtained highly valid information, the main problem remained the lack of comparability with previous data sets. The pilot survey focused on four major physical and mental disabilities. However, owing to the limited size of the sample survey, the data could not be reliably compared with data from any census or national-level survey. On the whole, data on the disabled population in Pakistan present a number of problems including those of definitions, reference periods, inconsistent categories, heavy dependence on the respondent's judgement which obscures objectivity and makes difficult, if not impossible, the ability to compare data sets.

Trends in disability

There are several ways data could be erroneous. There are reporting errors encompassing the respondent's biases, the interviewer's mistakes in coding and recording, his or her fatigue, rapport and interest in data collection as well as biases and manner of presenting questions. Data on disability could also be affected by the interviewer's training and degree of supervision. Census data collection has its own administrative supervision which concentrates mostly on the coverage of households rather than on the quality of data. The census coverage is usually massive. Therefore, the interviewer's fatigue, disinterest and bias could easily cause the introduction of errors, especially with regard to relatively low ranked priority areas such as the disabled population. Described below are some of the analytical errors detected which need to be identified for possible corrective measures in future censuses or surveys.

Distribution

Misreporting by respondents may be considered as a major factor contributing to the collection of erroneous data on the size of the disabled population. The following analysis focuses on possible sources of errors affecting the validity of data. The database on persons with disabilities in Pakistan is not comparable across censuses owing to definitional differences and selectivity of disability in different instruments. Comparing the proportion of the population disabled (table 1) in the 1981 census with that of the HED survey, it may be observed that the 1973 figures are much too high. These values lead to an uncertainty about the incidence of disability in the country. It is speculated also that underreporting is quite prevalent, especially for persons at the younger ages. Underreporting is further increased by the subjective nature of responses to various questions asked in the census. The general impression from the percentage of the population disabled indicates that in the early 1980s more than four persons per thousand population were physically or mentally handicapped and as such dependent on other household members for support and/or full-time care. This seems to be a high proportion considering the population growth rate and the actual size of Pakistan's population, i.e. 124.5 million in mid-1994 (ESCAP, 1994b).

The percentage distribution of the population of persons with disabilities shows an expected pattern by age group, i.e. a positive relationship between age and the incidence of disability. Concealment of information about persons with disabilities at younger ages is quite obvious from table 1. In contrast, with an increase in the number of disability categories in the 1981 census and the 1984-1985 survey, it is observed that a higher percentage of persons with disabilities is reported at younger ages. The decline in the percentage disabled among those aged 40 years or older, from 58.8 per cent in 1973 to 44.6 per cent in 1984-1985, could be attributed to this shift. A very large proportion of the population of persons with disabilities is reported for those aged 60 and older, which encompasses persons with age-related physical disorders. If the disability time-trend between 1961 and 1981 is considered, one may observe an increasingly smaller proportion of people with disabilities at older ages, especially after age 60, and a substantial increase among children aged 5-9 years. This may not be an actual shift, but rather a distribution closer to reality and may present a lesser degree of distortion due to the misreporting of disability among younger people. The picture emerging from the 1981 and 1984-1985 data would seem to indicate that a quarter of all disabled Pakistanis are under 15 years of age. If the data are valid, this situation should send an urgent signal to health policy makers of an increasingly deprived population that needs immediate attention.

Table 1: Percentage of population disabled in Pakistan

	1961	1973	1981	1984/85
Total population	42,880,378	60,509,535	84,253,644	-
Number disabled	135,668	1,257,454	371,420	-
Percentage of total	0.23	2.08	0.44	-
Total	100.0	100.0	100.0	100.0
Age group				
0- 4	13.4	3.9	3.4	3.4
5- 9	-	2.6	8.3	9.2
10-14	16.7	8.8	8.1	10.9
15-19	-	3.8	6.6	9.5
20-29	21.3	12.6	12.5	13.5
30-39	-	9.5	10.4	8.7
40 +	48.6	58.8	50.7	44.6
60 +	-	40.1	34.7	24.3

Disability rates

Calculation of disability rates is the basic measurement for understanding the intensity of disability in the population at large. These rates are calculated for those who are currently disabled from among the population of persons with disabilities and those at risk of becoming disabled for any reason. The disability rate is expressed as the number of disabled persons per thousand mid-year population:

$$\text{Disability rate} = (\text{Number disabled} / \text{Mid-year population}) \times 1,000.$$

For specificity, age-specific disability rates may also be calculated because persons at various ages are exposed to differential risks of becoming disabled. A comparison of age-specific rates would show how reported data measures differ from an expected pattern.

Table 2 shows the disability rates calculated for the 1981 census and the 1973 HED survey. The completeness of disability categories in the 1981 census is better than those of the HED survey, and the absolute number of disabled persons does not seem to be as exaggerated as in the 1973 survey. Furthermore, the 1973 HED rates show steep fluctuations, indicating some problems with the data obtained for various age groups. The overall estimates for 1981 depict a rate of 4.5 persons with disabilities per thousand persons in Pakistan (table 2) compared with 21 per thousand disabled in the 1973 survey; such differences indicate a high degree of incomparability to say the least. Age-specific rates also show a positive relationship with age for the 1981 census, implying adverse effects from ageing, or perhaps the increasing incidence of disease, or nutritional deficiencies, with age. Very low estimates for the age group 0-4 imply displacement or omission of disabilities. While not all types of disability equally affect various age groups or social groups, the reasons for their occurrence may be traced to human error or the prevalence of adverse conditions that perpetuate the occurrence of disabilities. For instance, the high prevalence of physical disabilities in rural areas could perhaps be traced to the non-availability or lack of accessibility to polio vaccine; also, the occurrence of birth defects could be caused and perpetuated by repeated close marriage i.e. of first cousins within a family over several generations, which is common in some areas. In the same context, the increased incidence of breast cancer among women living in areas with highly contaminated drinking water could also be cited. Job-related accidents happen everywhere, but when a high proportion of the physically disabled population is made up of accident victims, the situation is indicative of abnormally hazardous job conditions. Such conditions are avoidable and their elimination could reduce the incidence of certain forms of disability.

Table 2: Age-specific disability rates (per 1,000)

	Census HED Survey	
	1981	1973
Total	4.53	20.78
Age group		
0- 4	0.99	5.87
5- 9	2.33	3.39
10-14	2.80	13.73

15-19	3.16	8.69
20-24	3.72	25.93
25-29	4.26	10.72
30-34	4.59	23.53
35-39	4.14	10.91
40-44	4.49	23.09
45-49	4.25	12.70
50+54	6.03	45.21
55-59	7.62	24.50
60+	22.46	113.98

It is only in the 1981 census and the 1984-1985 survey that all households were asked questions on both mental and physical disabilities; tables 3 and 4 show the distribution of various disabilities in both periods. Similarities are evident in the percentages at all ages, except for blindness, as reported in the 1981 census. In an ideal situation, the percentage distribution of disabilities for various ages could be used with some caution as a time trend when consistent categories are absent for a number of censuses and surveys. In this regard, disability data for 1984-1985 do not show any erratic pattern, whereas in the 1981 census, the percentage blind for each age group fluctuates widely, with quite high percentages for the age group 20-24 years (table 3). The proportion of visually impaired persons appears consistent in both the 1981 census and the 1984-1985 survey among people aged 40 years and older, indicating that among older disabled people one-third of them are blind or experience sight-related problems. Among all persons with disabilities, about 16-17 per cent were reported to be "crippled" or "handicapped", with both the 1981 census and the 1984 survey consistently showing a much higher prevalence among younger than older persons (tables 3 and 4). Another consistent finding relates to the category "mentally retarded", which shows a peak at ages 15-19 years, implying a decline in the recent past. The data for persons with hearing and speech impairments show a steep decline after ages 20-24. Should it be concluded in observing these data that there has been a surge in the incidence of these disabilities in the recent past? A lower percentage (5.2 per cent) for the category mentally retarded at the youngest ages may depict omission or underreporting in the 1981 census (tables 3 and 4). The identification of persons categorized as "mentally retarded" and "handicapped" was important in the 1984-1985 survey. Although the category "insane" should also be retained in all such future data collection efforts, a better term should be used because it is not only the permanence of a disability which is of prime concern but also the existence and prevalence of comparable disabilities. It is the large differences in the various types of disabilities enumerated in the aforementioned census and survey which limit our understanding of the situation and make difficult programme planning for helping persons with disabilities.

Table 3: Percentage distribution of disabilities for various age groups: 1981 census

Age group	%	Blind	Deaf	Crippled	Mentally retarded	Insane	Other
Total	100.0	29.4	13.0	17.6	10.2	6.5	23.3
0- 4	100.0	24.4	19.5	27.8	5.2	5.0	18.0
5- 9	100.0	6.7	30.3	28.6	11.4	5.4	17.7
10-14	100.0	7.6	30.3	25.5	17.7	9.6	14.7
15-19	100.0	17.5	24.9	25.5	17.2	11.5	12.6
20-24	100.0	36.2	18.3	23.0	14.8	7.3	11.4
25-29	100.0	38.1	13.1	17.2	13.6	7.8	9.3
30-34	100.0	34.6	13.0	18.0	12.5	9.5	12.7
35-39	100.0	33.0	11.9	19.3	15.5	7.6	12.7
40+	100.0	35.7	7.3	13.0	6.6	4.7	32.8

Table 4: Percentage distribution of types of disabilities by age group, 1984-1985 survey

Age group	Total	Blind	Deaf	Mute	Deaf & mute	Leprosy	Mentally retarded	Handicapped	Lame	Others
0-4	100.0	9.1	3.2	15.7	9.1	1.5	9.4	27.2	14.0	10.5
5- 9	100.0	7.7	5.1	14.9	7.6	0.4	14.0	22.6	18.0	9.7
10-14	100.0	5.4	4.2	13.2	8.8	0.7	17.8	24.0	22.0	13.7
15-19	100.0	9.2	2.0	10.5	7.6	0.3	20.0	19.1	21.2	10.1

20-24	100.0	11.2	1.6	11.7	4.7	0.6	21.0	17.9	20.7	10.5
25-29	100.0	14.9	3.4	9.0	5.9	0.7	16.1	16.3	19.5	13.9
30-34	100.0	14.3	1.2	7.7	6.3	1.2	19.4	13.3	17.7	18.9
35-39	100.0	14.0	1.9	5.2	2.6	0.6	14.7	16.6	26.1	18.5
40 +	100.0	38.0	5.4	2.7	2.1	0.9	6.6	13.1	16.6	14.3
Total	100.0	22.5	4.2	7.5	4.7	0.8	12.4	15.9	18.7	13.4

The occurrence of various disabilities differs with regard to their timing and cause: for example, an individual could be physically impaired because of a recent disease or an accident, or because of a birth defect. Moreover, the nature of the disability could also vary in terms of its duration and the degree of dependency caused by it. Temporary visual impairment, psychological or physical disabilities may have a disease- or accident-based origin, but each of these types of disability may vary widely in terms of economic or physical dependency on others.

Table 5: Percentage distribution of disabilities by sex and place of residence: 1981 census

	Blind	Deaf & mute	Crippled	Mentally retarded	Insane	Other	Total	Disable as % of Total pop.
	Total							
TOTAL	29.4	12.99	17.61	10.25	6.41	23.34	100.0	0.45
MALE	22.02	11.28	20.29	12.36	7.96	26.10	100.0	0.38
FEMALE	35.34	14.37	15.46	8.55	5.17	21.12	100.0	0.53
	Urban							
TOTAL	27.15	13	17.68	15.25	7.45	19.48	100.0	0.33
MALE	19.05	10.26	19.83	18.7	8.95	23.19	100.0	0.30
FEMALE	34.96	15.63	15.59	11.92	6	15.9	100.0	0.36
	Rural							
TOTAL	30.01	12.99	17.59	8.92	6.14	24.36	100.0	0.50
MALE	22.91	11.58	20.43	10.46	7.66	26.96	100.0	0.42
FEMALE	35.43	14.07	15.42	7.75	4.97	22.36	100.0	0.60

Table 5 identifies six types of disability from the 1981 census. In broad terms, three reasons were considered in the 1984-1985 survey: disabilities from birth, those caused by disease and those caused by accidents (table 6). Problems related to commonalities between "at birth" and "disease" are clear. For instance, a disability reported as caused by a disease could actually be a birth defect or a disease-related deficiency such as weak maternal health, or inadequate immunity against childhood diseases. Similarly, visual impairment attributed to disease (72.4 per cent) could actually be a condition caused by the person's living environment or the conditions at his or her place of work. As for hearing impairments, about 60 per cent of respondents reported deafness as the main reason for their being disabled. By contrast, about 90 per cent of those with hearing and speech impairments reported the existence of their disability since birth. More than half of all those enumerated as mentally retarded were reported to have had the disability since birth; however, for more than one-third of the cases, disease was reported as the cause. The identification of a number of disabilities since birth would be indicative of much more complex pathways, which may include maternal health issues over and above other possible causes such as genetic disorders. In general, disease is attributed as the cause of disabilities acquired during youth or at older ages. According to table 6, accidents are not reported as a major factor in causing most disabilities except for those persons unable to walk or who suffer from any paralysis. While such findings should be of serious concern to programme planners, it should be kept in mind that reasons for commonalities or ambiguities may reflect a respondent's bias or the invalid recording of data about persons with disabilities that had not been verified by professional staff.

Table 6: Distribution of reasons for various types of disability: 1984-1985 survey Types of disability

Reason of disability	Blind	Deaf & Mute	Deaf & Leprosy mute	Mentally retarded	Handicapped	Lame	Others
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By birth	17.8	34.9	91.2	88.6	28.9	53.1	28.0	25.9	19.7
By accident	6.7	3.4	0.9	11.8	5.7	14.4	29.3	26.5	26.5
By disease	72.4	59.4	7.7	11.0	59.2	38.9	56.5	44.2	51.2
Others	3.0	2.4	-	0.43	-	2.3	1.1	0.71	2.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Differentials by sex and place of residence

One way of examining the validity of such results is by observing the sex ratio of persons with disabilities. At the aggregate level, the sex ratio of persons with disabilities exhibits no specific pattern. In a hostile political and hazardous work environment, males are normally subject to greater risk of injury and disability due to accidents than are females. The low sex ratio for persons with disabilities as recorded in the 1981 census would imply a higher incidence of disability among females, which if the data are valid cannot be explained easily here. Is it the way the questions were asked, or has some coding error given rise to a large number of females being recorded as disabled? In comparing the sex ratios from the 1984-1985 survey and the 1973 HED survey, we find the ratios to be similar, but the data do not engender confidence in the 1973 survey because of the very high proportion of the population recorded as disabled. What is the correct sex ratio of persons with disabilities in Pakistan? The answer remains a mystery, even though it is essential for planners and programme managers to know in order to establish appropriate rehabilitation and skill development programmes for the portion of the total population suffering from disabilities.

For a fuller understanding of disability where data are unreliable, differentials by sex and place of residence may be taken as indicators for future policy and programme development. A high rate of disability for one sex or a specific location in the country could be related to the practices surrounding prenatal care, circumstances at the time of delivery, dietary or nutritional problems, level of industrialization or even the geo-political situation of an area. For instance, one should expect a much higher incidence of disability among men during and after military hostilities, whereas a famine or the outbreak of disease would be more likely to adversely affect infants and women. Even for normal times, the 1981 census indicates that the number of persons with disabilities as a percentage of the total population (0.45 per cent) is substantial, especially with regard to women in both urban and rural areas (table 6). In the 1981 census, females were reported to have a much higher incidence of disability than males, and this situation was reported as being more prominent among rural than urban residents. For instance, many more women than men were reported as blind in the 1981 census both in urban and rural areas. Males were reported to have marginally more disabilities such as mental retardation or incapacitation in both urban and rural areas compared with women. A higher proportion of males was found among those who were physically disabled, which could be expected because of the greater exposure of men to a hazardous work environment and participation in violent activities. Similarly, the prevalence of "insanity" would seem to be higher among males than females, according to the 1981 census data. More research obviously needs to be undertaken to identify the reasons for the differentials. Is the prominence of mental retardation among males related to genetic reasons that are known to add to the neonatal mortality of males? Is the prominence of visual, hearing and speech impairments among females rooted in behavioural differentiation towards females in Pakistan? What action has been taken to remove hazards to working men and women so that they will not be disabled for life.

In contrast with the 1981 census data, data from the 1984-1985 survey exhibit higher sex ratios for all disabilities for certain provinces and the country as a whole (table 7). In examining the data one could justifiably ask if the 1984-1985 survey is a presentation of socially expected data rooted in both the respondents' and interviewers' biases? Is greater exposure to a hazardous environment the main factor in shaping these patterns for males or are genetic differentials really involved? The ratios swing to the other extreme when we examine the sex ratios for Balochistan where the categories for hearing and speech impairments exhibit very low values. The concealment of information regarding females, especially about their disabilities, is quite obvious in Balochistan which is the least developed part of the country. Even if definitional and coverage differences are ignored, the divergence of disability-specific sex ratios between the 1981 census and the 1984-1985 survey is inexplicable and confusing. The high percentage of males being reported as "mentally retarded", "handicapped" and "lame" in the 1981 census could be because of the underreporting of incidence among females, or serious genetic disorders causing mental and physical disabilities among males. What could explain the high incidence of blindness among females reported in the 1981 census? The absence of a similar pattern in the 1984-1985 survey creates serious doubts about the reliability of the various data. If a higher female disability rate, particularly for blindness, is assumed to be true (as indicated by the 1981 census) as well as high male mental retardation rates (as indicated by the 1984-1985 survey), what investigations have been carried out to determine the reasons for the extremes recorded? There are several possibilities. One reason for a high rate of female blindness may be related to women's social roles within the family which could foster the postponement of treatment in order to deal with other matters considered more important. In addition, a woman's inability to go to a clinic alone to seek medical

care could aggravate such a situation.

Table 7: Sex ratio by type of disability, by province

Disability	Pakistan	Punjab	Sindh	NWFP	Baluchistan
Total	2.05	2.18	1.74	1.88	2.92
Blind	1.37	1.47	1.07	1.26	2.92
Deaf	2.22	1.97	2.11	3.64	2.43
Mute	1.45	1.84	1.22	1.38	0.49
Deaf/mute	2.33	2.70	2.02	1.33	0.20
Mentally retarded	2.58	2.17	3.69	2.27	12.3
Handicapped	1.86	2.15	1.19	1.53	5.04
Lame	3.19	3.17	3.2	2.77	4.64

Note: NWFP = North Western Frontier Province.

Disability dependency ratio

Another important dimension about the population of persons with disabilities is their dependence on the economically active population. An index of disability would indicate the gravity of the increasing level of dependency, especially when the population growth rate is quite high: currently 3.0 per cent per year (ESCAP, 1994b); the Government's estimate is 2.9 per cent per year. The importance of this ratio for our study lies in the life-time dependency of persons with disabilities rather than for a relatively short period before children become economically active or before the elderly die. If disability dependency is defined as the ratio of persons with disabilities to the entire labour force, then in 1981 for every 1,000 persons working there were about 17 persons with disabilities who were dependent on others for support. This ratio is high, especially since the population below 15 years of age is quite large and is assumed to be dependent on the working-age population. The ratio is a little low for urban areas, with 14 persons with disabilities per 1,000 working-age population. This lower ratio for urban areas is due to both a lower level of reported disabilities and a higher percentage of the urban population being employed. In addition to these aspects, limited opportunities exist for rehabilitation and economic participation of the large majority of the population with disabilities. Another matter relating to such data is the fact that the dependency ratio is subject to variations in line with changes in definition and the reference period of the disability. In view of all these aspects, it is obvious that there are numerous problems related to the data available on the population with disabilities. The following section, therefore, suggests ways to improve data on disabilities in Pakistan.

Conclusion and suggestions for improving data on disabilities

Even though underreporting and misreporting of persons with disabilities is obvious from our analysis, the overall trend during the last three decades exhibited by the absolute number of this portion of the total population would indicate that the proportion of the population with disabilities is probably growing rapidly in Pakistan. Despite the data difficulties, observing the prevalence of disabilities recorded in the censuses of 1961 and 1981 would lead one to expect a much higher incidence of disability concealed by both poor data collection and the cultural imperative to avoid talking about such matters especially with strangers. If the data are valid, the doubling of the population with disabilities between 1961 and 1981 would be an alarming occurrence, demanding that adequate measures be undertaken to reduce the growth rate of this proportion of the total population.

If the absolute data are assumed to be correct, then one could easily estimate that, by the mid-1990s, about 1 million persons with disabilities would be living in Pakistan, and that more than half of them would be 40 or more years of age. The expansion of this portion of the total population would hold serious economic and social implications for Pakistan. It would mean that about a million households in Pakistan would have at least one member with a disability, with households in rural areas more likely to be affected than those in urban areas. In view of this number, at least another million able-bodied persons of the same household would also be occupied full-time in caring for the member(s) with a disability, which means that opportunities for income-generation by those persons engaged in the care of the disabled are lost. The same million households would also have extra economic pressures put on them as they would have to allocate additional resources to cater for the needs of those persons with disabilities, including medical treatment for them and the provision of all their daily needs.

Under this scenario and in view of the general level of poverty that characterizes a sizeable proportion of

Pakistan's population, a relatively high percentage of these one million households could be expected to be severely burdened economically, especially if they already have a high number of dependents both at younger and older ages.

Females were reported to have a higher risk of disability than males (table 5) and more so in rural compared with urban areas. This high risk is attributed to the high prevalence among Pakistani females of disabilities such as visual, hearing and speech impairments; by contrast, more males than females would seem to have intellectual and physical disabilities. On a national scale, depending on the validity of the data, more rural than urban residents would seem to have disabilities. In relative proportions, more urban than rural households reported the presence of intellectually disabled persons, indicating that there may be some degree of concentration in urban areas and implying that special programmes should be developed to alleviate such problems.

One may conclude from this analysis that it would not be impossible to exercise some control over the possibly increasing rate of various disabilities, the major portion of which would seem to be caused by preventable accidents or curable diseases. Therefore, better research into the various causes of disability would help in addressing this issue and enhancing the quality of life of people with disabilities, which is one of the main aims of the aforementioned Decade.

If the prevalence and incidence of disabilities in Pakistan are considered as indicators of the quality of life in that country, the likely increasing magnitude of disabilities would hold many long-term implications for the Government and all organizations concerned. The following activities are recommended, therefore, for improving the situation in the future.

1. Awareness and education: Education of high risk groups is highly recommended to make them aware of behavioural causes leading to the increased risk of disability. Similarly, increased awareness of good physical and psychological hygiene and a demand for specific types of health care could help men, women and children to reduce their risk of both psychological and physical disorders. Furthermore, literature about disabilities should be identified for the use of people with disabilities, their families, specialists and the general public to increase their awareness of disabilities and the measures that can be taken to improve the quality of life for the people concerned.

2. Increased availability and accessibility: Increased accessibility to medical care through the use of mobile units could provide much needed relief to disabled people in rural areas, especially mobile eye clinics for females with visual impairments. Similarly, better antenatal and postnatal care for children and improved access to polio vaccination would help to reduce the risk of contracting an easily preventable disabling disease.

3. Social recognition and rehabilitation: In order to engender greater acceptability for and better assimilation of psychologically and physically disabled people in society, the Government should initiate special education courses and provide opportunities for such persons to gain acceptance in society. In this regard, social organizations should be encouraged to assist persons with disabilities with regard to their physical needs, and where possible, provide job opportunities through employment bureaus in order to help them live a more independent life.

4. Research and methodologies: Unfortunately, disability is one of the areas that seems least attractive to researchers in Pakistan. No concrete research study exists that utilizes either census or survey data to examine the patterns, levels, or determinants of disabilities in this country. Yet there is a dire need for in-depth analysis of data on persons with disabilities, using survey data at the district level to identify the concentration, differentials by geographic region, social characteristics, reasons for the disabilities, prevalence rates by social status, efforts at rehabilitation, and potential for involvement of persons with disabilities in social and economic activities. There is also an urgent need to illuminate the causes of disability so as to assist the Government in organizing rehabilitation programmes and forestalling possible reasons for the emergence of various new types of disability, such as those usually identified with growing urbanization: violence and drug abuse, for example.

This study has tried to identify a number of lacunae in the data on the population of persons with disabilities in Pakistan. The main problems associated with various data sets relate to definitional changes, reference periods, categories included, importance given to data on persons with disabilities during the training of interviewers for the actual collection of data, the supervision of personnel and monitoring of the process with quality checks. This study further identified areas requiring special attention from the trainers of future census-takers, especially with regard to the verification of the population with disabilities. Owing to the complexity of the respondents' potential biases, interviewers' fatigue and inadequate training, data quality has been adversely affected. Therefore, special surveys on disabilities should be conducted at all district levels in

order to obtain valid and reliable data. Such in-depth data would provide district administrators with hard facts on which to plan more precisely for the rehabilitation of disabled persons according to their needs.

Another aspect that requires immediate attention is obtaining data on the duration and real causes of various disabilities in Pakistan. The need for a flexible method for collecting such data is especially important with regard to disabilities that anecdotally seem to be increasing, such as depression and various kinds of psychological illness. Since several studies of malnutrition and diarrhoea as major causes of disability have been undertaken, it may be asked what has been done to prevent these problems? If congenital problems are thought to be a major source of disability, are the data adequate and has in-depth analysis been undertaken to examine this hypothesis? In summary, it is obvious that much more effort must be devoted to the collection of valid and reliable data on the population of persons with disabilities. This has been a neglected issue, but ignoring it may inhibit the future development of a "quality population" in Pakistan.

Changing social conditions in Pakistan, including an increase in the number of nuclear families, rapid urbanization, the vulnerability of certain social groups, especially the poor, women and children, and increased environmental hazards, all make it necessary that increased threats to human health and life be recognized and properly recorded so that patterns will be identifiable and so that measures can be taken to prevent disabilities on one hand and rehabilitate persons with disabilities on the other hand. The need is all the more pressing because of the transitional state of Pakistan's society, which includes a break-down in some areas of the traditional extended family system with its support structures, and the consequently greater likelihood in the future of dependence of those with disabilities on state agencies for the provision of care and rehabilitative services. Current social welfare programmes, in general, seem to be ad hoc in nature and do not address the human aspects of the disabled population. With the rapidly growing population pressure on urban settlements and the alienation of the family support system, the disabled population could be neglected in the future. Therefore, good data are required on a regular basis to examine the patterns and the causes of disabilities. Given the complexity of the types of disabilities, the following measures are suggested for the government agencies collecting data on persons with disabilities.

One item that is missing in all sources of data is the duration of disabilities. Time-references for each disability should be included in all such data collection efforts in order to differentiate between permanent disabilities and those resulting from illness which could be for a short duration. Such differentiation is important in order to cover various psychological and physical disorders that are emerging, especially in urban settings. The need to provide a time-reference is based on the differentiation between rehabilitation and treatment programmes for such disorders. Such information would also assist researchers and programme managers to determine the likelihood of various types of disability occurring and to observe how disabilities that were initially perceived as temporary later became permanent. Further, knowledge of the duration of disabilities would further help planners in assessing the dependency ratios in society and in developing rehabilitation programmes.

The classification of disabilities in the 1984-1985 survey is among the better ones, but added attention still needs to be given to the nature of physical and psychological disorders.

An important but neglected issue is the recurrence or repeated prevalence of certain disabilities in a single household, especially congenital disabilities or those acquired during infancy or early childhood. Such information would help in identifying high-risk or disability-prone families needing special attention and care. In-depth analysis of households at risk would help the Government to identify the root causes of recurring disabilities, and thus enable it to take measures to prevent them.

There is a need for establishing good benchmark data and updating them by undertaking detailed confirmatory surveys. The population census of Pakistan that was scheduled for October 1994 has been postponed. Because the delay is expected to overshadow the importance of the data needed to assess the population of persons with disabilities, a representative sampling of households should be collected immediately. For monitoring purposes, census data would ordinarily be a good source for examining the level, types and duration of disabilities. Unfortunately, previous censuses have given only very casual attention to the collection of data on disabilities. Therefore, all future population censuses should make serious efforts to collect data on consistent disability categories, as highlighted in the 1984-1985 survey. Important in this regard is the language and wording used for determining the real situation concerning people with disabilities, the quality of training of interviewers, their salary and incentives, verification of cases by supervisors and data coding and editing, all of which would do much in improving the validity of such data. Verification of cases of disability to establish their validity is recommended at the district level, with specialized social workers trained to verify and examine the degree, severity and complexity of the disorder, as well as to gather information regarding treatment, attitudes towards persons with disabilities, their social needs, and the social status of persons with disabilities. Such an elaborate exercise would not only provide reliable data but also identify the unmet needs of persons with disabilities at the district level. It

should be emphasized that the training of district teams is crucial in the light of similar research efforts that identify various aspects of disabilities that respondents usually overlook, hide or underreport. To provide less than these minimal improvements would be tantamount to rejecting the United Nations Charter's affirmation of faith "... in the dignity and worth of the human person....."

Footnote

1. The words "impairment", "disability", and "handicap" are sometimes used interchangeably. The distinction between "disability" and "handicap" has become a major philosophical point for the disability movement which focuses on breaking barriers, both physical and attitudinal, to the participation of disabled people in society. Disabled Peoples' International (DPI)-Australia defines disability as follows: "Disability is a functional limitation within the individual caused by physical, intellectual, emotional, or sensory impairments". The World Programme of Action concerning Disabled Persons defines handicap as follows: "Handicap is ... a function of the relationship between disabled persons and their environment. It occurs when they encounter cultural, physical or social barriers which prevent their access to the various systems of society that are available to other citizens. Thus, handicap is the loss or limitation of opportunities to take part in the life of the community on an equal level with others". Other terms relating to people with disabilities are ideally put in a positive way: the hearing impaired (instead of deaf), visually impaired (for blind), intellectually disabled (for mentally retarded) etc. While the author would like to have used such terms, it was not possible because of the need to use wording similar to that of the various data sources to which he refers.

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The Influence of Socio-biological Factors on Perinatal Mortality in a Rural Area of Bangladesh
(Demographers' Notebook)

By Golam Mostafa

* The authors of this paper are Golam Mostafa, International Centre for Diarrhoeal Disease Research, Bangladesh, GPO Box 128, Dhaka 1000, Bangladesh; Andrew Foster, University of Pennsylvania; and Vincent Fauveau, UNFPA Country Director for Cambodia, who at the time of co-authoring this paper was with the London School of Hygiene and Tropical Medicine.

Reduction of perinatal mortality in developing countries is highly dependent on the management of pregnancy and delivery. The identification of important risk factors could help to direct attention to mothers who need special care, thereby leading to a more efficient health programme to improve their survival. Several previous studies (James, 1968; Saksena, 1980; Zimmer, 1984; Bakketeig and Hoffman, 1979; Misra and others, 1973; Forbes, 1985; Serour, 1981; Stanley, 1981; and Fortney, 1982) of perinatal mortality that have been carried out in different countries suffer from a number of difficulties. Most of the studies have been limited to univariate or bivariate analysis and thus have provided little scope for assessing the net effect of a particular risk factor on perinatal mortality when the effects of other factors are taken into account. Those studies that utilized multivariate techniques considered only a few of the possible risk factors. The studies suggest, however, that survival of the perinatal period is influenced by a number of characteristics of the woman and her reproductive history. Infants born to women in the mid-range of the reproductive years were found to have better perinatal survival chances than those of either younger or older mothers (Srivastava and others, 1969; Misra and others, 1973; Saksena, 1980; Forbes, 1985; Bakketeig, 1979; Stanley and others, 1983; Kiely and others, 1986). In contrast, Baird (1962) found that age did not influence perinatal mortality after controlling for social class in a developed country. Other studies have found that survival chances improved with socio-economic status as measured by such indicators as parental education and parental occupation (Saksena and others, 1980; Forbes and others, 1985; Stanley, 1980; Erhardt and others, 1973; Ross, 1964; Serour and others, 1981; Adelstein and others, 1980). Nulliparity also has been found to increase risk significantly (Kiely and others, 1986) as has both short (e.g. less than two years) and long (more than five years) intervals between pregnancy outcomes (Fedrick and others, 1973; Zimmer, 1979). Similarly previous fetal wastage has been strongly associated with perinatal mortality.

It is rare, however, to have data of high quality on all of these risk factors from an area in which infant mortality is known to be quite high and to be able to analyze this information in a multivariate context. The present study considers data on all pregnancies that ended in a stillbirth or live birth in a rural area of Bangladesh during the years 1982 to 1984. It considers the relationships of both biological and socio-economic factors to perinatal mortality.

Methodology

The International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) has been operating a Demographic Surveillance System (DSS) in Matlab thana (district), rural Bangladesh, since 1966. The DSS combines periodic censuses of the study population with continuous registration of vital events and migration. Vital events are reported by 110 female community health workers who visit each household once every two weeks. In half the area, a Maternal and Child Health and Family Planning Programme (MCH-FP) is conducted by the Centre; the remaining villages serve as a comparison area. The recording of vital events on standard registration forms is the responsibility of male health assistants who, accompanied by the community health workers, visit each household every 5-6 weeks to obtain detailed information about any event that took place since their previous visit. Details of the data collection system have been reported in an earlier publication (Cholera Research Laboratory, 1978).

During the study period, the surveillance area consisted of 149 villages with a total population of about 190,000, each of whom was identified by a unique registration number. Gestational age was determined by the field workers at the time the birth was reported, using the mother's menstrual history. If gestation was seven months or more and the pregnancy ended in a non-live birth, the outcome was classified as a stillbirth. The field workers distinguished between live and non-live births by asking the mother and other persons attending the birth about signs of life such as breathing or muscular movements. They also asked mothers about their previous pregnancy history; this information was used to define pregnancy order and past pregnancy wastage. The interval between the pregnancy of interest (index pregnancy) and the previous one was determined by searching DSS pregnancy termination records for nine previous years and selecting the most recent prior birth. Maternal and paternal education (number of years of formal schooling) and

paternal occupation, all of which factors were considered measures of socio-economic status, were obtained from the census conducted in the study area in 1982. Women who had migrated into the area after the 1982 census were excluded from the study because no information on education, occupation, or previous pregnancy interval was available.

The 22,122 pregnancies that were registered in 1982-1984 were considered in the present study: of these pregnancies, there were 785 stillbirths and 21,337 live births; further, 817 neonates died during the first week of life (0 to 6 days). The perinatal mortality rate was defined as the number of stillbirths plus early-neonatal deaths per thousand total births (live births plus stillbirths).

The analysis was carried out in two stages: first, perinatal mortality rates were calculated according to univariate characteristics of the parents and of the birth. Second, multivariate logistic regression was employed to estimate the net effects of these factors on perinatal mortality. Confidence interval and odds ratio were calculated using Miettinen's test-based interval (Kleinbaum, 1982).

Results

Table 1 presents perinatal mortality rates and odds ratios according to each variable considered in our analysis. None of the socio-economic or areal measures showed a statistically significant association with perinatal mortality when analyzed individually, whereas all pregnancy history variables and maternal age did. The significance of these associations was measured by calculating the odds ratio for each category of a particular variable, relative to a designated reference category, where the odds are defined as the perinatal mortality rate divided by the survival rate for infants born to women with a particular characteristic¹. An odds ratio greater than one indicates a higher mortality risk than the reference category, while a value less than one indicates a lower risk. Statistical tests can show if the difference between the observed odds ratio and one (the value expected if the odds are the same in both categories) is significant. In addition, the 95 per cent confidence interval for the ratio is given in the last column of table 1.

Table 1: Perinatal mortality rates (per 1000 LB) by different socio-biological factors, Matlab, 1982-1984 (Univariate)

Factors	Number of Live births	Perinatal deaths	Rate	Odds ratio	95% confidence interval
					of odds ratio
Mother's education (years)^a					
None	13,826	1,106	79.9	.94	.79-1.13
1-5	5,059	346	68.4	.80	.71-1.06
6+	1,825	150	82.1	1.00	-
Father's education (years)					
None	9,078	693	76.3	1.05	.92-1.18
1-5	5,390	405	75.1	1.03	.90-1.18
6+	6,901	504	73.0	1.00	-
Father's occupation^b					
Lower	6,851	497	72.5	1.03	.88-1.24
Middle	8,118	627	77.2	1.11	.95-1.30
Higher	3,484	244	70.0	1.00	-
Area					
MCH-FP	9,875	728	73.8	1.00	-
Comparison	10,833	817	75.4	1.02	.92-1.14
Age of mother					
<20	2,079	236	112.5	1.73 * *	1.49-2.01
20-34	16,514	1,137	68.9	1.00	-
35+	2,758	229	83.0	1.22 * *	1.05-1.42
Parity					
0	4,587	509	110.9	1.88 * *	1.67-2.12
1-4	12,029	748	62.2	1.00	-

5+	4,753	345	72.5	1.19 *	1.04-1.36
Previous fetal wastage					
None	17,485	1,203	68.8	1.00	-
1	3,033	253	83.4	1.23 *	1.07-1.42
2+	851	146	171.6	2.84 **	2.35-3.44
Pregnancy interval status ^c					
<24 months	3,907	340	87.0	1.54 **	1.35-1.78
24-59	10,883	631	57.9	1.00	-
60+	2,188	170	77.7	1.37 **	1.14-1.64

Notes: ** P<0.001; * P<0.01;

a Total number of cases are different owing to mission data.

b Lower = daily labour, unemployed, agriculture labour etc.;

Middle = skilled labour, small business, etc.; and Higher = service, established business, agriculture owner etc.

c First pregnancy were excluded.

The mortality odds do not vary significantly by category of maternal or paternal education, by paternal occupation, or by area of residence. They do, however, differ according to age of the mother and her pregnancy history. A reversed J-shaped relationship is observed: young women (under 20) have infants who are at high risk of perinatal mortality relative to those whose mothers are 19-34 years at the time of the birth. The risk to infants of women over 35 years of age is also elevated, but not nearly as much as for young mothers.

A J-shaped relationship of similar magnitude is found by parity: first births are much more risky in terms of perinatal survival than birth orders 2-5, and birth orders 6+ again have somewhat elevated mortality rates. Similar results are found for previous pregnancy intervals. Children born within two years of the end of a previous pregnancy have especially high mortality odds compared with those born 2-5 years after a previous pregnancy, while those born after a long interval (60+ months) also experience higher mortality. Finally, the more previous fetal losses a woman has experienced, the greater will be the risk of perinatal mortality in her subsequent pregnancies.

To examine the relationship between each of these variables and perinatal mortality while controlling for the effects of the others, logistic regression models were estimated. Three groups of factors were considered: socio-economic and areal variables; age and parity; and the more detailed pregnancy history variables, previous pregnancy interval and previous fetal losses². Model I shown in table 2 includes only the first group. Although one coefficient is statistically significant, the model taken as a whole represents no improvement in predictive power over the model that uses only the constant term to predict survival status at the end of the perinatal period³. The second group of variables (representing age and parity) improves the prediction of survival considerably. Model III shows that previous pregnancy interval and fetal loss also are significantly related to perinatal mortality; the only non-significant term is for the variable that represents no previous pregnancy. All three groups of variables are included in Model IV, which confirms the earlier results: the coefficients for the first group of variables are not significant individually and the model, taken as a whole, is not an improvement over our final model, Model III.

The net effect of each variable in the model is represented by the value of the coefficients. A positive value indicates a higher mortality risk. Since all coefficients (except the constant term) are positive, the lowest mortality risks are found in infants of reference group mothers: those aged 20-34, who have already had a live birth and have never experienced fetal loss, and whose child is born 2-5 years after the previous pregnancy termination.

Table 2: Multivariate logistic regression coefficients of perinatal mortality on different factors, Matlab, 1982-1984.

Factor	Reference category	Model			
		I	II	III	IV
Constant		-2.483 ***	-2.759 ***	-2.958 ***	-2.999 ***
	Mother's education (years)				
None	6+	-0.984			-0.010

1-5		-0.200		-0.136
	Father's education (years)			
None	6+	0.031		0.041
1-5		0.030		0.033
	Father's occupation			
Low	High	-0.055		-0.031
Middle		0.047		0.061
	Area			
Comparison	MCH-FP	0.020		0.061
	Age of mother (years)			
<20	20-34	0.174	0.208 **	0.209 **
35+		0.304 ***	0.184 **	0.167 **
	Parity			
0	1+	0.552 ***	0.500 *	0.505 *
	Pregnancy interval (months)			
None	24-59		0.195	0.204
<24			0.242 *	0.243 ***
60+			0.268 *	0.291 *
	Previous fetal wastage			
1	None		0.263 *	0.263 *
2+			1.020 ***	1.020 ***
Likelihood ratio statistic		11,494.5	11,390.4	11,270.8
Degrees of freedom		22,146	22,150	22,145

Notes: * p<.01, ** p<.05, *** p<.001

For them the log odds of mortality is given by the constant term and the odds by $\exp(-2.958) = .052$. The estimated proportion surviving the perinatal period is, then, $.052/(1+.052) = .049$. The odds for infants of mothers in a particular category relative to the reference group (the odds ratio), is given by $\exp(b)$, where b is the estimated coefficient for that variable. For example, the relative odds for infants of young mothers (relative to the reference group) is given by $\exp(.208) = 1.23$. The estimated odds for this category are given by $\exp(\text{constant}+b) = \exp(-2.958 + .208) = .063$ and the estimated mortality rate by $.063/(1+.063) = .060$. The relative risk is simply this rate divided by that for the reference category, or 1.22.

Thus perinatal mortality for infants of the youngest mothers is 22 per cent higher than for those who are a few years older, but have all other characteristics the same. If the young mother is also primiparous, the odds of dying increase further (to $\exp(-2.958+.208+.500) = .105$) as do the relative odds (to 2.03).

Both the relative odds and the relative risk are shown in table 3 for groups of women that differ from the reference group on only one of the factors included in the model. As can be seen, these values are almost identical when the risk of dying is quite small.

The results indicate that women hoping to deliver their first live birth and women who have experienced difficulty in the past, as measured by two or more fetal losses, have especially high risks of perinatal mortality.

Discussion

The findings of this study are generally consistent with those of the studies established previously, although some differences are observed. The main contrast is the lack of association with any measure of socio-economic status. It may be that in a rural area of a developing country there is, uniformly, little access to maternity care during pregnancy for the mother and during delivery and thereafter for both mother and newborn that might improve perinatal survival chances. It may also be that there are few differences in fertility patterns by social class. If, for example, young mothers were drawn disproportionately from among the poorer and less educated groups, a spurious univariate association between social class and perinatal mortality would be engendered because of a true association between maternal age and perinatal survival.

Our study has confirmed that survival of the perinatal period is separately related to both maternal age and

primiparity. Once maternal age is taken into account, high parity shows no evidence of decreasing survival chances. Of note are the sizable negative effects of short inter-pregnancy intervals and of previous experience with fetal loss.

Table 3: Predicted mortality rate, relative odds and relative risks of perinatal mortality for groups of women that differ from the reference category on a single characteristic *

Group	Predicted perinatal mortality	Relative odds	Relative risk
Reference group **	49.4	1.00	1.00
Age of mother (years)			
<20	60.1	1.23	1.22
35+	58.7	1.20	1.19
Parity			
0	78.9	1.65	1.60
Pregnancy interval (months)			
None *	59.4	1.22	1.20
<24	62.0	1.27	1.26
60+	63.6	1.31	1.29
Previous fetal wastage			
1	63.2	1.30	1.28
2+	125.9	2.77	2.55

Notes: * Predicted from Model III, table 2.

** Reference group: women aged 20-34, parous, pregnancy interval 24-59 months, no previous fetal wastage.

These results suggest that, to reduce perinatal mortality, programmes targeted at primiparous women, at those who had had fetal losses and to both younger and older mothers should be considered. Serious attention should be given to the types of antenatal and delivery care that may be feasible in the context of rural developing countries. It can also be recommended that efforts to increase fertility control practices that lengthen the inter- pregnancy interval to more than 24 months would be effective in reducing individual experience with perinatal mortality.

Footnotes

1. For example, age is divided into three categories, with women 19-34 years selected as the reference group. The survival odds are:

$$\text{Odds}_{\text{ref}} = 68.9/931.1, \text{Odds}_{35+} = 83.0/917.0.$$

The odds ratio for the oldest age group is, then, $\text{odds}_{35+}/\text{odds}_{\text{ref}} = 1.22$.

2. In preliminary analyses, the coefficient of the variable representing high parity (equal to or greater than 5) was never significant when age was included in the model. Parity is, therefore, treated as a dichotomous variable here.

3. Logistic regression models that are nested (in that all variables included in the model with fewer variables also appear in the larger model) can be compared using their likelihood ratio statistics. The difference between the two statistics has a chi- square distribution with degrees of freedom equal to the difference in the degrees of freedom for each model. In this case, the difference in likelihood ratio statistics is $11501.4 - 11494.5 = 6.9$, with degrees of freedom = $22153 - 22146 = 7$, which is not significantly different from zero. Therefore, this group of variables does not improve our explanatory power.

4. If the probability of dying, p , is very small, the odds ratio $p/(1-p)$ is nearly identical to p itself. Therefore, the relative odds and relative risk will be nearly identical.

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