

Ahead of Target: Achievement of Replacement Level Fertility in Sri Lanka before the Year 2000

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Sri Lanka will have a rapidly ageing population, and this change will require substantial shifts in policies to cater for changing needs

Sri Lanka, like several other developing countries in the Asian and Pacific region, has entered the third stage of demographic transition, the phase of declining fertility, as has been evident since the early 1960s. The first stage of high birth rates, around 40 per thousand population, and high death rates of 20 per thousand population ended in the mid-1940s when mortality started to fall dramatically (Caldwell, 1986). During the second stage of transition, i.e. declining mortality, the crude death rate dropped at an unprecedented annual average rate of about 1.5 per thousand, reaching the level of 12 deaths per thousand population in 1950.

Compared with other South Asian countries, Sri Lanka has had the highest rate of fertility decline, followed by India and Bangladesh; over the period 1960-1965 to 1985-1990, Sri Lanka's total fertility rate (TFR) declined by almost 50 per cent (table 1). Afghanistan and Pakistan have shown no significant decline in their TFRs. Nepal had even shown a slight increase in the TFR over the same period, although Tuladhar (1989) found reason to believe that some degree of fertility decline had begun in 1986. However, fertility in three newly industrialized economies (NIEs), Hong Kong, Republic of Korea and Singapore, exhibits a much higher percentage decline than Sri Lanka's: for example, Hong Kong's TFR came down by 75 per cent in the period between 1960-1965 and 1985-1990. The United Nations medium variant population projections prepared in 1990 have assumed that Sri Lanka will achieve replacement fertility by the year 2000-2005 (United Nations, 1993).

Sri Lanka has recently experienced transitions in major demographic phenomena and it is now at the very important stage of the fertility transition where it seems to be heading even below replacement-level fertility. Replacement-level fertility implies a total fertility rate usually between 2.1 and 2.2 children per woman, depending on a country's level of mortality. Since the infant mortality rate of Sri Lanka is at a very low level (only 19 per thousand live births in 1990), its replacement fertility is defined as an average of 2.1 children per woman. If Sri Lanka achieves replacement fertility, it will be the first country in the South Asian subregion to record such a low level of fertility. Sri Lanka seems to be clearly ahead of target; it was targeted to achieve replacement fertility by the year 2000, but by 1993 it seems that it had already hit that target.<sup>1</sup>

As with the Sri Lankan population policy, India's population policy was implemented in order to achieve replacement fertility by the target year 2001; however, the target has been revised and the time in which India should have replacement fertility is not until the period 2011-2016 (ESCAP, 1993; Rajan and others, 1993). Bangladesh also set a replacement-level fertility target for the year 2005; however, from the figures in table 1 the achievement of such a target seems to be rather remote. Nearly all the countries in East and South-East Asia have adopted population policies to attain replacement-level fertility, through the promotion of universal contraceptive practice and the achievement of low mortality levels. In fact, unlike almost all the South Asian countries, many of the South-East Asian and East Asian countries either have reached their goals or are close to doing so (Debavalya, 1993; Alam and Tan 1993).

Therefore, taking up South Asia's fertility transition, this article, firstly, touches briefly upon fertility control policies, programmes and targets in Sri Lanka. Secondly, it addresses the unexpected emergence of fertility decline, especially its timing, magnitude and the major factors underlying the reproductive revolution in Sri Lanka.

#### Data

The study analyses data primarily from the 1987 and 1993 Sri Lanka Demographic and Health Surveys. The samples in both surveys are multi-stage stratified probability samples representative of the whole country, excluding the North and East provinces. According to the 1981 population census, the two provinces excluded in both the survey owing to civil disorder there, contained only 14 per cent of the total population of Sri Lanka.

A total of 6,170 eligible respondents were identified in the 1987 Sri Lanka Demographic and Health Survey (SLDHS) and interviews were completed among 5,865 ever-married women aged 15-49 years with

a response rate of 95.1 per cent. In the 1993 Sri Lanka Demographic and Health Survey, 7,078 eligible respondents were identified and interviews were completed with 6,983 ever-married women aged 15-49 years, with a further enhanced response rate of 98.7 per cent. These constitute the respondents for the present study.

Both the 1987 and 1993 SLDHS surveys involved the use of two basic questionnaires: one on households which recorded information on all household members, and one questionnaire on individuals which recorded detailed information on eligible women, who were identified from the household questionnaires. The questionnaire on individuals collected information on each respondent's background characteristics, reproductive history, knowledge and practice of family planning, breast-feeding practices, marriage, fertility preferences, and health and anthropometric information on children. The details of the surveys are available elsewhere (Department of Census and Statistics, 1988 and 1994).

#### Population change and natural increase

The total population enumerated in Sri Lanka at the first census in 1871 was only 2.4 million; at the last census of population (1981) it was 14.8 million and in 1993 it was estimated to be 17.6 million. This represents more than a seven-fold increase since 1871. The overall trend in population growth during the period 1871 to 1946 has been one of fairly low growth ranging from 0.9 to 1.7 per cent per annum, followed by rapid escalation to 2.8 per cent per annum in the immediate post-Second World War years 1946-1953. Thereafter the growth of the Sri Lankan population has declined steadily and by 1992 the country had one of Asia's lowest population growth rates, i.e. 1.0 per cent.<sup>2</sup> The two main factors responsible for the decline in the rate of growth of population are fertility decline and increased emigration, especially to the Middle East and to developed countries.

The rapid increase in the annual rate of population growth in the post-war years in Sri Lanka was the result of a sharp decline in the death rate, while the birth rate remained at around 35-40 live births per thousand population (figure 1). Since 1947 the death rate has declined gradually to a very low level of about 5 per thousand population with an expectation of life at birth of 70 years for males and 74 years for females in 1991. A gradual decline in the birth rate began in 1960 and has had the effect of reducing the annual rate of growth. The birth rate which stood at 37 per thousand population in 1960 had declined to 20 by 1992.

#### Fertility control policies and targets

The size of the population causes Sri Lanka to be classified as a medium-sized country, not a small one, although in land area it is indeed a very small country (Ministry of Health, 1993). Thus, Sri Lanka is one of the most densely populated countries in Asia: in 1881, density was only 42 persons per square kilometre (sq. km), but by 1992 a more than six-fold increase was reported and it reached 271 persons per sq. km. Continuing growth of the population and pressures on land have been of increasing concern to the Sri Lankan Government, because population growth has been far more rapid than could be sustained by the economy.

For the first time in Sri Lanka, the Ten-Year Plan of 1959-1968 expressed grave concern about the rapidly increasing population<sup>3</sup> (National Planning Council, 1959). Even though the history of fertility control policies in Sri Lanka dates back to the 1950s, these concerns were not followed by any policy measures. Only in 1965 did the Sri Lankan Government, by a Cabinet decision, accept family planning as a national policy; it became active in 1968 when the Family Health Bureau was established within the Ministry of Health (Dangalle, 1989).

Between 1968 and 1977, under the umbrella of this organization, there was a gradual expansion of family planning activities and these services were integrated with the already well-developed maternal and child health services which were provided throughout the country. In fact, the Five-Year Plan (1972-1976) presented in 1971 recognized that "a high birth rate in the context of low standards of living and malnutrition can lead to a general deterioration in the health of the population and to an increase in the incidence of disease and to a rise in infant mortality. It is essential therefore that facilities for family planning should be made available to all groups in the population and not confined to the privileged sections of society" (Ministry of Planning and Employment, 1971).

After a new Government came to power in 1977, it relied heavily on population information, education and communication (IEC) programmes and implemented such activities with a view to developing a favourable social climate for the acceptance of family planning. At the same time more and more resources were devoted to contraceptive service delivery, particularly voluntary sterilization, by introducing incentives for service providers as well as acceptors of sterilization. After 1979, there was a considerable increase in the number of sterilizations among married couples. Some argue that the most plausible explanation for this

rapid increase was the introduction of a cash incentive of 100 rupees (US\$ 6.25) in 1980 with subsequent increase in the payment to acceptors (Williams, 1982; Thapa and others, 1987; Basnayake, 1988).

As the Government of Sri Lanka noted in many instances, the need to curb the still growing population was obvious, and population control was seen as critical in balancing the available resources with the demands of an increasing population. Therefore, the Government for the first time set a more quantitative target of achieving replacement-level fertility (a TFR of 2.1) to be achieved by the year 2000 in its population policy statement issued in 1991 (Ministry of Health, 1992:23).

What emerges from the policy statement is that, in order to achieve zero population growth (stable population: equal birth rates and death rates) under conditions of low mortality, Sri Lanka needs to bring down fertility to the replacement level, which means an average of about two children per family. As population projections indicate, if the country is able to achieve a two-child family average by the year 2000, then about half a century later, around the year 2050, the population will stop growing and by that time the population will be about 25 million (Ministry of Health, 1993). However, more recent survey data clearly indicate that the assumption of the future fertility decline made in almost all population projections of Sri Lanka is under-estimated and thus the future size of the population and the year in which it would have zero population growth have been over-estimated.

### High to replacement-level fertility

Levels and trends of fertility in Sri Lanka can be estimated from population censuses, the registration system<sup>4</sup> and more recently from survey data. The TFR for selected years from 1953 to 1988-1993 are shown in table 2. They decreased from 5.32 in 1953 to 3.45 in 1981, i.e. almost two live births per woman. They dropped further from 2.82 in 1982-1987 to 2.26 in 1988-1993. In other words, Sri Lanka's fertility dropped about 20 per cent within the period between 1982-1987 and 1988-1993 (table 3). The study of the age pattern of fertility is important because it indicates the tempo of childbearing; the age at which women begin to reproduce, the age at which they cease childbearing, and any change in the pattern of childbearing over time. As shown in figure 2 and table 3, the age-specific fertility rates rise with increasing age; they peak in the age group 25-29 years. Over many decades, there has been no change in this pattern. Between 1953 and 1975, large fertility reductions were common at all ages, except for the age group 40-44; however, between 1975 and 1987, the reductions were dominant in the older reproductive age groups. Between 1987 and 1993, not only did the older women experience a remarkable decline in fertility in this very short period but the younger ones did also; among women in the 20-24 and 25-29 age groups declines in fertility were 26 per cent and 17 per cent, respectively, during the period between 1982-1987 and 1988-1993 (table 3). The change in age-specific fertility clearly indicates that women in Sri Lanka are inclined to limit the number of children at a relatively early age (De Silva, 1991). Unlike what happened in Costa Rica (Gendell, 1989), in Sri Lanka there has been no stall in the fertility decline, and it seems that the decline is taking place among all socio-economic strata of the country.

Has Sri Lanka reached replacement-level fertility? To answer this question, data primarily from the two Demographic and Health Surveys (DHS) in 1987 and 1993, and the 1980-1982 census and registration-based fertility are used. As shown in table 3, even though the estimates of TFR produced by averaging the reported births of the five years before the survey to the survey date are only 2.82 and 2.26 for the period 1982-1987 and 1988-1993, respectively, within these five-year periods, the magnitude of the decline cannot be ignored (table 3). Comparing the TFR of 3.38 in 1980-1982 (averaging reported births during 1980-1982) with the TFR of 2.82 in 1982-1987 indicates that there was a clear decline in TFR between the last population census in 1981 and the 1987 SLFHS.

To facilitate the argument on fertility decline, the TFR of the period 1985-1987 from the 1987 SLDHS survey, measured by averaging the reported births of the three years before the survey, has been compared with the five-year average of the same survey. Since the five-year (1982-1987) average and the three-year (1985-1987) average estimates of TFR are 2.82 and 2.62, respectively, these figures show a reduction of at least 0.2 in live births per woman over this period (table 3).

When this 0.2 live birth margin is applied to the TFR value of 1988-1993 of the SLDHS survey<sup>5</sup>, assuming the same pattern of fertility decline in the 1987 SLDHS survey, then a TFR of 2.06 can be obtained for the period 1991-1993 (figure 3). The TFR estimate of 1991-1993 is lower than the replacement level, i.e. 2.1 TFR. Even if a lower reduction margin than 0.2, say 0.1, is applied to the TFR of 1988-1993, by 1992 or 1993 Sri Lanka had already achieved replacement-level fertility.

Another approach is used in figure 3 in order to determine the current level of TFR in Sri Lanka; it also indicates no significant difference from the previous finding: current fertility is at the replacement level or even moving below it. In this particular approach, the observed trend in TFRs of the period 1982-1987 and

1988-1993 is projected to reach the replacement level during the year 1992. In this procedure, the observed trend in TFR is extended for just 1.5 years only, thus minimizing the possible error that could be introduced in linear extrapolation.

In comparing the fertility declines of a newly industrialized economy (NIE) with those of Sri Lanka, the similarities are clear (figure 3). Both Sri Lanka and the Republic of Korea show the same pattern of fertility decline, but Sri Lanka's fertility levels have always remained higher than those of the Republic of Korea; the Korean TFR dropped from 2.7 in 1980 to replacement level in 1985, i.e. within a period of just five years (KIHASA, 1992), whereas in Sri Lanka it took about six years for TFR to drop from 2.7 in 1986 to the replacement level in 1992 (see the five-year averages of TFRs in figure 3). The Republic of Korea has reduced fertility to below the replacement level and has maintained a TFR of 1.6 for the last decade. However, at this juncture, it is not possible to predict how Sri Lanka's policies and programmes will react when the TFR falls below the replacement level as experienced in the Republic of Korea.

#### Observed and wanted TFR

How has the observed fertility of the Sri Lankan woman differed with regard to her wanted fertility? In their analysis of the 1987 SLDHS data of Sri Lanka, Westoff and others (1989) showed that comparison of the desired TFR of 2.3 per woman with the observed TFR of 2.8 per woman shows that TFR would be near the replacement level if only wanted births occurred (table 4). Interestingly, by 1988-1993 Sri Lankan TFR had come down to the level of 2.3 per woman, indicating greater success in fertility control (the incidence of unwanted births is expected to be insignificant). As shown in table 4, if urban Sri Lankan women were able to have only the births they wanted, then their fertility would be even below replacement level (1.9 live births per woman) compared with their observed TFR of 2.2. The lowest proportion of unwanted births is found in the estate sector, where the norm of fertility control has not yet become common as in other parts of the country; the highest proportion of unwanted births (17 per cent) in the period 1982-1987 is in the rural sector, which accounts for almost three-fourths of Sri Lanka's population.

During the early stage of the fertility transition, unwanted births can be expected to increase (Srinivasan and others, 1984). Ultimately, as is now evident in Europe and the United States of America, fertility control has become virtually universal, and unwanted births have declined to a small fraction, the level of which depends on the efficacy of contraceptive practice and the extent of induced abortion (Westoff and others, 1989). How has contraceptive practice among Sri Lankan women changed along with the rapid decline in fertility? Has there been a shift towards induced abortions in order to avoid unwanted births?

#### Contraception and induced abortion

##### Current use of contraception

Many researchers have indicated that up to 1970 marriage postponement in Sri Lanka was responsible for about 60 per cent of the fertility decline, but after 1970 the main contributing factor in the fertility decline was the control of fertility within marriage: marital fertility decline (Trussell, 1980; McCarthy, 1982). In fact, there was evidence that the decline in marital fertility in Sri Lanka had already started before the national family planning programme could have had much impact (Alam and Cleland, 1981; Langford, 1982). After the inauguration of the national family planning programme, the Government adopted a "cafeteria" approach whereby clients could select the contraceptive method of their choice from a wide range made available to them through the national programme (Dangalle, 1989). In addition to the public sector, a number of non-governmental organizations (NGOs) provide family planning services.<sup>6</sup>

The level of contraceptive use among Sri Lankan women increased rapidly in the period following 1970. There was increasing awareness of contraception not only for the purpose of ceasing childbearing but also for the spacing of births. The level of contraceptive use increased from 32 per cent in 1975 to 62 per cent in 1987 and further to 66 per cent in 1993 (table 5). The acceptance of modern contraception in Sri Lanka is a relatively recent development. In the 1975 Sri Lanka Fertility Survey among the current users of contraception, 59 per cent were relying on modern methods; in both the 1987 SLDHS and the 1993 SLDHS, the corresponding estimates were 66 per cent only. This clearly implies that a large proportion of users in Sri Lanka are still relying on traditional methods. At present among the current users just over one-third rely on traditional methods.

Although the prevalence of contraception increased in Sri Lanka, there was no comparable reduction in fertility over the same period; Gajanayake and Caldwell (1989) believe that substantial underreporting of contraceptive use in the 1975 SLWFS and better reporting in subsequent surveys are largely responsible for the apparent discord in data on fertility and contraception. Comparing the prevalence of modern and traditional contraception in the 1975 and 1982 surveys, it is possible to argue that it is the traditional

methods, rather than the modern methods, which have been underreported (table 5). Among the currently married women aged 15-49 years in the 1982 survey, traditional method users constituted over 24 per cent (the highest level in all the four national surveys) and in the subsequent surveys almost the same level was retained. Since traditional methods are considered to be less effective, better access to modern contraceptives would be expected to result in reduced reliance on traditional methods. Unlike in Sri Lanka, in most other countries, historically, as the overall prevalence of contraceptive use has grown, it has done so through modern methods, which have outpaced or replaced growth in use of traditional methods (Ross and Frankenberg, 1993).

#### Projected level of current use

As reported by De Silva (1990) and the Ministry of Health (1992), contraceptive prevalence in Sri Lanka would have to rise to 71 per cent by the year 2001 if replacement-level fertility were to be achieved. However, Sri Lanka already achieved the replacement target in 1993 with a prevalence rate of only 66 per cent (table 5). Even though the fertility target has already been achieved, neither the level of contraceptive prevalence nor the method mix in 1993 match the expected pattern for the year 2001; the practice of modern contraception among currently married women is expected to increase to 53 per cent by the year 2001, but in fact when the replacement target was achieved in 1993 only 44 per cent of currently married women were relying on modern methods, while the use of traditional methods of contraception in 1993 was higher than the expected use level at the time of achieving the replacement target (table 5).

The proportions of currently married women relying on male and female sterilization are expected to increase to 7 per cent and 30 per cent, respectively, by the year 2001, from the low values of 4 per cent and 17 per cent in 1981. In fact, from the 1975 SLWFS (the first survey with national coverage), the numbers of women relying on male and female sterilization have increased fairly consistently in all the subsequent surveys (as expected in the contraceptive level and method mix projections), but in the years 1987 and 1993, the opposite occurred: male and female sterilization showed a setback during the 1987 and 1993 surveys (table 6).

The fundamental question which arises is: how has Sri Lanka attained replacement-level fertility without achieving the corresponding contraceptive prevalence level and also without achieving the corresponding increase in modern methods of contraception, particularly sterilization? The answer will naturally depend on (a) how the expected level of contraceptive prevalence was projected and (b) the level of induced abortion practised in Sri Lanka as a birth prevention method.

The contraceptive prevalence rate required to reach a target TFR, as reported by De Silva (1990), is estimated by using the method of Bongaarts (1984), in which the fertility-inhibiting effect of each of the four principal proximate determinants<sup>7</sup> is measured by an "index" that can only take values between zero and one. As indicated by De Silva (1990), to estimate future contraceptive needs, firstly, it is required to set the target fertility level to be achieved. Secondly, it is necessary to postulate the future trends in the proximate determinants of fertility other than contraception, namely marriage, post-partum amenorrhoea and abortion.

TFR has been assumed to have declined from 3.4 in 1981 to 2.1 in the year 2001. Except for the total induced abortion rate, the rest of the proximate determinants, namely age pattern of fertility, age pattern of marriage and duration of post-partum amenorrhoea, have all assumed the appropriate direction of change over the period 1981 to 2001. In the absence of any reliable estimate from a national sample survey or other source, and also because abortion is not a legitimate method to adopt for family planning purposes in Sri Lanka, the practice of induced abortion is taken as negligible in the base year of 1981 and also in the target year of 2001. It seems that this particular assumption has led to over-estimating the required future contraceptive prevalence to achieve replacement fertility.

#### Induced abortion

Naturally, if the practice of induced abortion increases, the contraceptive prevalence rate required to achieve replacement fertility will be lower. That is exactly what is happening in Sri Lanka.<sup>8</sup> Although induced abortion is technically illegal under the criminal code, throughout Sri Lanka medical practitioners daily perform a large number of abortions in response to a growing demand for such services. They regard abortion as a simple and relatively lucrative medical procedure that ensures them a fairly high level of income. For some doctors, pregnancy terminations are regarded as a necessary medical recourse for those women who have conscientiously used contraceptives but have become victims of contraceptive failure. Abortions are also related to the growing number of young, unmarried women who become pregnant as the result of changes in their sexual practices, particularly among the Free Trade Zone (FTZ) migrant workers, owing to less parental control over them.

In the past, when an unmarried young woman was found to be pregnant she was usually married off as soon as possible to the man who was responsible in order to avoid a social calamity. In contemporary Sri Lanka, since many young females are employed in FTZs or in manufacturing industries located throughout the country, they are increasingly finding it difficult to get married and those who have married find it is quite costly to have more than two children or even to have more than one child. Obviously, many constraints are affecting reproductive norms and behaviour. If many women participate in the labour force, so that smaller families become the norm, even non-working women will tend to have a smaller number of children. Moreover, to keep their fertility low because of economic hardship and reasons of health, mothers who become pregnant again soon after giving birth also are at a high risk of demanding abortion in contemporary Sri Lanka.

No reliable national estimates could be obtained on abortions because of its illegality; however, researchers tend to believe that abortion does exist as a fertility control method in Sri Lanka (Langford, 1982; Caldwell and others, 1987; De Silva, 1991). A survey conducted as long ago as 1984 using in-depth interviewing (Caldwell and others, 1987) showed that most couples in Sri Lanka believed that abortion occurred to a limited extent while perhaps one-fourth felt that it was common. The majority of those against abortion hold their views on the ground that it is dangerous rather than that it is immoral. Caldwell and others (1987:16) assert that:

"The real level of abortion may be higher than is generally stated because curettage is often carried out for what are thought to be other purposes. This is a complex issue in Sri Lanka because the medical profession advocates and carries out curettage more readily, perhaps, than anywhere else in the world and does so even for minor menstrual irregularities."

As reported by Caldwell and others (1987) on their 1984 survey findings, when the respondents were asked if they would discuss whether they had had abortions, just over one-sixth of the couples said they were willing to discuss it. It is interesting that, once the discussion began, just over half of these couples said they had procured abortions. When respondents were asked who performed the induced abortions, 80 per cent said modern doctors, 30 per cent said Ayurvedic or other traditional practitioners, and 5 per cent said knowledgeable village women.

Since more and more western-style medical institutions in Sri Lanka are currently providing induced abortion without objections from the State, it is believed that abortion-related health complications and also abortion-related deaths are becoming less frequent. This safety factor may have also acted as a positive impetus to seek abortion among women who become pregnant unintentionally. Moreover, since in Sri Lanka one-fourth of current contraceptive users are still relying on less effective traditional methods, perhaps a significant majority of them may wish to turn to induced abortions when they become pregnant.

#### Summary and conclusion

Even though Sri Lankan fertility started to decline before the national family planning programme could have had much impact, until 1970 it was marriage postponement which contributed most to the fertility decline and after 1970 it was fertility control within marriage. Thus, Sri Lanka's fertility transition has followed the typical pattern.

Among the developing countries, Sri Lanka is often cited as an exception in relation to its mortality transition. Perhaps very soon it may also be cited as exceptional in its fertility transition, because it seems to be clearly ahead of its fertility target. Expected to achieve replacement-level fertility by the year 2000, it had already hit the target by 1993 and fertility seems even to be falling below the replacement level. In the Asian context, particularly for a South Asian country, this is a rather rare occurrence. Most countries which were targeted to achieve a specific level of fertility in a particular year were unable to achieve those targets.

In the 1987 SLDHS, the desired TFR is lower than the observed TFR, implying a considerable proportion of unwanted births at that time. However, during the period 1988-1993 TFR came down to 2.3 per woman, equal to the wanted TFR reported in the 1987 SLDHS. When replacement fertility was achieved in 1993, only 66 per cent of currently married women were practising contraception, but the contraceptive requirement projected for achieving the replacement level indicates that the level would have to have been 71 per cent. Thus, a significantly large proportion of women seem to be relying on induced abortion to terminate unwanted pregnancies. Female employment, weakened parental control over adolescents, the difficulty of getting married, economic hardship, the strong desire to have a small family and easy access to western-type abortion clinics, all might have contributed to an increase in abortion. In the Sri Lankan demographic transition, therefore, induced abortion seems to be playing a potential role in fertility decline as in most countries of Asia, irrespective of its legal status.

In the case of low fertility, what will be the future trend of population policy in Sri Lanka? Perhaps when fertility has dropped so far (i.e. below replacement) that eventual population decline will ensue, together with a loss of economic vitality, Sri Lanka will have a rapidly ageing population, and this change will require substantial shifts in policies to cater for changing needs. Perhaps at the current stage, a return of fertility to a higher level is neither feasible nor desirable, and ageing and labour shortages in coming decades will be inevitable. Thus, it would be more useful to plan ahead to prepare more effectively and efficiently for the next century.

#### Footnotes

1. Demographic target-setting is a fairly recent practice. Targets have proved valuable in the implementation and evaluation of population and health programmes, particularly in the Asian and Pacific region (ESCAP, 1993).

2. Even though none of the other South Asian countries has achieved a population growth rate of 1.0 per cent, Sri Lanka, along with Australia, each with a population of 17.6 million in 1992, has recorded this low population growth rate (ESCAP, 1994). However, Australia achieved replacement-level fertility (TFR of 2.14) almost 20 years before Sri Lanka had approached it (Monnier and de Guibert-Lantoine, 1992).

3. It also expressed the need for a policy to influence the course of the birth rate but which excludes all forms of compulsion, yet would strengthen the factors favouring a decline in birth rates in the interest of both the individual family and society as a whole. The authors of the Plan, however, were reluctant to formulate a policy of their own, but stated that it was desirable that the whole question of population policy in all its aspects be made the subject of nationwide discussion, perhaps through the medium of a competent "committee of enquiry".

4. Registration of births, deaths and marriages in Sri Lanka was introduced in 1867; in 1897, birth and death registration was made compulsory. The registration system then introduced is still functioning, with changes made from time to time. In 1980, the Department of Census and Statistics (1984) pointed out that the overall completeness of birth registration was as high as 98.8 per cent and death registration 94.0 per cent.

5. The data collection of the 1993 SLDHS took place during July and September 1993; in the 1987 SLDHS, it was done during January and May 1987. However, the graphical presentation of these survey points has shown mid-1987 for the 1987 SLDHS, and mid-1993 as the 1993 SLDHS.

6. Family planning in Sri Lanka dates back to the early 1950s when it was introduced as an organized effort by the Family Planning Association of Sri Lanka (FPASL), the first NGO to be active in family planning with sponsorship from the Government of Sweden. Apart from FPASL, the Sri Lanka Association for Voluntary Surgical Contraception (SLAVSC), Population Services Lanka (PSL) and Community Development Services (CDS) are some of the NGOs currently providing family planning services in Sri Lanka. Some NGOs also conduct mobile programmes, especially in the plantations where medical teams visit estates on a pre-arranged date and provide sterilization services.

7. In accordance with Bongaarts's original approach, the following fertility-inhibiting factors (proximate determinants of fertility) were considered: marriage pattern, contraceptive prevalence and effectiveness, induced abortion, post-partum infecundability, frequency of intercourse, spontaneous abortion, and sterility. By definition, a change in any of these determinants will cause a change in fertility. However, previous research has shown that the first four of these factors are in general the most important determinants of trends in fertility (Bongaarts, 1984). The model presented by Bongaarts in this particular approach will, therefore, focus on these four principal proximate determinants (De Silva, 1990). The basic equation defining the relationship is:

$$TFR = C_m \times C_c \times C_a \times C_i \times TF$$

The model as summarized in the above equation has been applied for target-setting, since the ratio of target fertility,  $TFR(t)$ , to present fertility,  $TFR(0)$ , is estimated by:

$$TFR(t) < T > C_m(t) \times C_c(t) \times C_a(t) \times C_i(t) \times TF(t)$$

$$TFR(0) < T > C_m(0) \times C_c(0) \times C_a(0) \times C_i(0) \times TF(0)$$

where  $t$  refers to the target year and  $0$  to the base year. The second equation makes clear that the reduction

in fertility from TFR(0) to the target level, TFR(t), depends on trends in all of the indexes.

8. The impact of induced abortion on fertility control cannot be underestimated in most of countries in the developing world; even in the developed countries, induced abortion cannot be excepted in their transitional phase to lower fertility levels. China, in pursuit of its one-child policy, reached a total fertility rate of 2.4 per woman, close to the replacement level, during the period between 1985 and 1990 with the liberal use of induced abortion. The Republic of Korea has reduced fertility to a level below replacement and has maintained TFR at 1.6 per woman for the last decade. This achievement is also partly related to the role of induced abortion (Hong, 1993).

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Provincial Patterns of Contraceptive Use in China

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More attention should be paid to the quality of care in family planning programmes instead of focusing on quantitative aspects

China's economic reforms since 1978 have brought about tremendous changes in many aspects of society. Most importantly, by establishing private enterprises and fostering decentralization, it has changed the fundamental characteristics of socialist China during the period 1949-1976: i.e. public ownership and central planning, which resulted in various adjustments at local levels in the implementation of centrally planned policies according to local socio-economic conditions. One of the most noticeable changes has been in population policy. Since the one-child policy was announced in 1979, it has been maintained, but with frequent shifts in strictness and adjustments of central guidelines of policy implementation over time and by location. Generally speaking, it has changed from strict, centrally enforced policy implementation in the late 1970s and early 1980s to more decentralized policy implementation and local family planning regulations since the mid-1980s. Those changes have affected fertility as well as patterns of contraceptive use in China (Aird, 1985, 1990; Greenhalgh, 1986; Hardee-Cleaveland and Banister, 1988).

Numerous books and articles have documented the pattern of fertility decline, and the relationship between socio-economic development, family planning programme implementation and fertility change in China (Wolf, 1986; Poston and Gu, 1987; Feeney and Yu, 1987; Feeney and others 1989; Greenhalgh, 1989; Peng, 1989). It was found that the family planning programme, with contraceptive use (including induced abortion for contraceptive failure) as the key element, played a very important role in China's fertility decline. The studies of patterns of contraceptive use in China show that the dominant method of contraception is the IUD, and there is also a very high percentage of sterilization (Poston, 1986; Choe and Tsuya, 1991; Kaufman and others, 1992). Some critics of Chinese family planning have suggested that women are pressured to use specific methods, mostly IUDs and sterilization, often without adequate counselling (Hardee-Cleaveland and Banister, 1988; Aird, 1990). Other field studies suggest that in China, when women have no strong method preferences and information services are lacking, provider recommendations are the predominant influence on contraceptive choices (Kaufman and others, 1992).

After a decade of economic reform, China has more divergent regional development and more localized family planning regulations. Under these changed circumstances, it has become important to re-examine patterns of contraceptive use and their relation to socio-economic development. The main purpose of this article therefore is to study the relationship between regional socio-economic development, decentralized family planning programmes and the patterns of contraceptive use in China.

#### Data and methods

This study uses data from the Two-per-thousand Fertility and Birth Control Survey of China conducted by the State Family Planning Commission of China in 1988. The Survey interviewed 485,235 households and total sample size was 2,152,044, including 467,162 women aged 15 to 57 (State Family Planning Commission, 1990). This study is based on a 10 per cent subsample randomly drawn from the total data set of the Survey.<sup>1</sup>

The period studied is from 1979 to 1988 -- 10 years since the one-child family planning policy was announced and economic reform was begun. Because few women use contraception between the time of marriage and the birth of their first child (1.35 per cent in this study), the present study includes only the currently married women since 1979 who had at least one child and were currently using contraception. This included 12,296 women in the study.

There are 29 provinces, municipalities and autonomous regions in China, which are used as the unit of analysis to study provincial contraceptive patterns. The methods of contraceptive use are classified into five categories: sterilization (including vasectomy and tubal ligation), IUD, oral pill, condom and others. In some of the tables, the use of pill and condom are classified as "others" for simplicity of the analysis.

Considering the facts of contraceptive method specification by birth order of Chinese family planning programmes, and the local area variations in fertility levels, all calculations of provincial patterns of contraceptive use are standardized by birth order.

## Background

Decentralization and the development of private enterprise are two of the most important features of China's economic reform. Reform was initiated with the rural land reform of the late 1970s and gradually extended to various aspects of society (Luo, 1985; Liu, 1987). A decade of reform has not only brought about rapid socio-economic development, but also increased the gap between levels of development in different subregions of China. The gross output value of agriculture, for example, increased from 100 in 1980 (1980 = 100) to 114 in 1985, and to 168 in 1988. The gross output value of industry increased from 100 in 1980 (1980 = 100) to 159 in 1985, and to 280 in 1988. The per capita national income increased from 376 yuan in 1980 to 674 yuan in 1985, and to 1,081 yuan in 1988. The largest difference in per capita income between provinces in 1986 was 3,065 yuan (406 yuan in Guizhou Province and 3,471 yuan in Shanghai), and in 1989 the largest difference was 3,993 yuan: Guizhou, 631 yuan and Shanghai, 4,624 yuan) (State Statistical Bureau of China, 1990).

Recently, there has also been a mass movement of establishing enterprises and companies or joint ventures with foreign investors in China. People involved in the movement extended from farmers and workers to cadres and intellectuals. These changes form the basis of decentralized population policies and family planning regulations. There have been many studies about the development of China's population policies, especially since the one-child family planning policy was announced in 1979. Croll and others (1985) studied some implications of this policy. Greenhalgh (1986) and Hardee-Cleaveland and Banister (1988) analyzed population policy changes during the economic reform. Aird's study (1990), with a critical view of Chinese population policy, documented in detail China's population policy development during the 1980s. These studies showed that the period from 1979 to 1983 represented a centrally enforced one-child family planning policy and programme, and was followed by a short period of adjustments in central policy guidelines induced by the economic reform and decentralization in policy implementation. Although there were some signs of "tightening up" family planning policy towards the late 1980s, China's family planning policy implementation has developed from a stringent to a more flexible and decentralized one since the time economic reform began (Zeng, 1989). The present study is not intended to review the development of China's population policy, but to focus on the development of local family planning regulations since the early 1980s.

From the early 1980s, some provincial family planning regulations appeared in China, since the national regulations seemed premature during the period of rapid socio-economic change. In 1980, Guangdong Province passed "the family planning regulations of Guangdong Province", the first local government family planning regulation in China. In 1986, Ningxia Autonomous Region, and Qinghai and Shaanxi provinces also passed local family planning regulations. Provincial family planning regulations were established by Sichuan Province in 1987 and Jilin, Liaoning, Shandong, Anhui, Hubei, Fujian and Guizhou provinces in 1988. They were followed in 1989 by Tianjing, Hebei, Zhejiang, Guangxi and Hainan. By January 1991, all provinces in China, except Xinjiang and Xizang, had local family planning regulations (Feng and Hao, 1992).

The provincial family planning regulations consist mainly of two parts. The first part consists of regulations limiting the number of children one couple may have. All local regulations maintain the one-child family planning policy but have different criteria under which couples are allowed to have two or more children. The second part refers to policy implementation, which consists of population planning, contraceptive use, rewards and punishments and regulations pertaining to the "floating" population. The most relevant regulations with regard to the study of contraceptive patterns and method choice in China are those involving contraceptive use. All local government regulations make it clear that all couples of childbearing age who have not received birth quotas should practise some kind of effective contraception. The regulations of 14 provinces<sup>2</sup> require couples to use an IUD after the birth of their first child, and to use sterilization after the second child.

The regulations of Liaoning, Hebei, Henan, Hunan, Shanxi, Gansu, Ningxia, Yunnan and Guizhou provinces state clearly that all pregnant women without a birth quota (*jihuawai huaiyun*) must end their pregnancies by means of abortion. In the same situation, 14 other provinces, Beijing, Shaanxi, Inner Mongolia, Jilin, Jiangsu, Zhejiang, Anhui, Fujian, Jiangxi, Shandong, Hubei, Guangdong, Hainan and Guangxi, state that the couple should (at a given time or as soon as possible) stop their unplanned pregnancies by means of abortion. Sichuan is the only province which requires the couples with an unplanned pregnancy to pay a certain fine (Feng and Hao, 1992).

It is clear that about half of the provincial family planning regulations (14 provinces) specify the methods of contraception for couples by birth order and that almost all provinces require women with unplanned pregnancies to have an abortion. Although the rest of the provincial regulations do not specify contraceptive methods by birth order, the national guideline of "first child: IUD, and second child: sterilization" in the early 1980s has exerted a major influence on providers in practising family planning (Banister, 1987; Kaufman and others, 1992).

### Contraceptive use

One of the defining characteristics of the socialist era of China was the continual use of "mass mobilization campaigns" (qunzhong yundong) to achieve socialist goals. Bennett (1976:18) defined the mass campaign as "a government-sponsored effort to storm and eventually overwhelm strong but vulnerable barriers to the progress of socialism through intensive mass mobilization of active personal commitment". The one-child family planning programme bore the obvious characteristics of a mass mobilization campaign (White, 1990). It is unlikely that the level of socio-economic development in most areas of China in the late 1970s was up to levels which would support such low fertility as one child per family. Increasing pressure on the Government to modernize, especially considering the population growth momentum, alarmed the Government sufficiently for it to take some decisive actions to control population growth. When the level of socio-economic development and the influence of traditional culture were not in favour of government-desired social changes, such as the one-child per family policy, an alternative measure to achieve the change was employed, i.e. a mass mobilization campaign.

One of the most important elements in the one-child family planning programme is the massive use of programme-directed contraception (including induced abortion) to achieve desired family planning goals. It is obvious that effectively controlling population growth requires the use of effective and long-lasting contraceptive methods. The most effective contraceptive method is sterilization, and one of the most long-lasting non-permanent contraceptive methods is the IUD. It is understandable for a Government such as China's to be in favour of those contraceptive methods as the means for achieving the goal of limiting family size.

Table 1 shows the percentage of contraceptive use, by method, of currently married women aged 15 to 49 in selected Asian countries and areas. It is clear that China has very high rates of sterilization and IUD users. About half of the contraceptive users have been sterilized and more than 40 per cent depend on IUDs. The table shows that the Republic of Korea has the highest rate of sterilization (58 per cent), and China has the second highest rate of sterilization and the highest rate of IUD users. In total, about 90 per cent of contraceptive users in China during 1988 depended on those two methods. For use of the pill, condoms and other contraceptive methods, China has the lowest rates among all the selected Asian countries and areas.

It is not unreasonable to expect similar patterns of contraceptive use under similar socio-economic conditions and the influence of traditional culture. For example, in Taiwan Province of China, Hong Kong and Singapore, only about one-third of contraceptive users depend on sterilization, and no less than 40 per cent of contraceptive users choose contraception other than sterilization and the IUD. It is very unlikely that the differences in socio-economic development between Taiwan Province of China, Hong Kong, Singapore and China as a whole would fully account for the differences in contraceptive patterns. The unusually high percentage of sterilization and IUD use, and the relatively low percentage of other contraceptive methods used in China suggest that the family planning programme indeed directed the pattern of contraceptive use.

This point is further supported by birth control operations from 1978 to 1990, as shown in table 2. It is clear that from 1981 to 1988, where the contraceptive figures are available, not less than 85 per cent of the contraceptive users depended on sterilization and IUDs. Table 2 also reflects the influence of government-initiated family planning campaigns on the total number of birth control operations in China. There was a surge in the total number of operations in 1979 after the announcement of the one-child family planning policy. The peak of the government-enforced family planning programme occurred in 1983 when the total number of birth control operations topped 58 million. The total number of sterilizations increased about five times from approximately 5 million in 1982 to approximately 20 million in 1983. A minister of the State Family Planning Commission of China, who was in favour of contraception campaigns and sterilization, was responsible for the dramatic increase in 1983 of birth control operations. The following year, a new minister was assigned to that post.

Since 1984, the total annual number of birth control operations has been about 30 million, with about 10 million IUD insertions, 2 million removals and 10 million induced abortions annually. Considering that an increasing number of people have been reaching marriageable age since the mid-1980s owing to a late

1960s "baby-boom", these figures may in fact indicate a reduced number of total annual birth control operations in China. Decentralization during the period of economic reform and localized family planning regulations may also be responsible for those changes.

#### Provincial patterns of contraceptive use

On average, the level of use of sterilization and IUDs in China is very high (90 per cent), but there are considerable variations in contraceptive methods between subregions. Table 3 presents the standardized percentage of currently married women since 1979, and the percentage currently using contraception in 1988, by method, in 29 provinces, municipalities and autonomous regions of China. Although the national figures of contraceptive use show a total of 90 per cent sterilization and IUD users in 1988, the provincial figures reveal vast differences in the method choice. The use of sterilization is as low as 11 per cent in Guizhou Province, and as high as 63 per cent in Fujian Province. More than 40 per cent of users in Ningxia and Xinjiang depend on contraceptive methods other than sterilization and IUD, while less than 5 per cent of users in Shaanxi, Henan, Sichuan, Guangdong and Hainan provinces do so. Preliminary analysis reveals that more developed regions, namely Beijing, Tianjin and Shanghai, among others, and less developed regions with a higher proportion of ethnic minority populations, namely Qinghai, Ningxia, Xinjiang, Yunnan, Guangxi and Guizhou, among others, tend to have a higher percentage of use of user-controlled methods and a relatively low percentage of sterilization. This suggests that the more developed and the less developed regions of China may have similar patterns of contraceptive use.

In order to analyze the relationship between socio-economic development and contraceptive patterns, a socio-economic index (SES) developed by Mauldin and Berelson (1978) is constructed for each province of China for 1988. The following seven variables make up the index for each province.<sup>3</sup>

- Per cent adult literacy
- Primary and secondary school enrolment ratio
- Expectation of life at birth
- Infant survival rate
- Percent of male labour force not in agriculture
- Gross provincial product per capita
- Per cent urban population

Provinces were ranked from high to low on each variable; the ranks were then added and divided by the number of variables, i.e. seven. The scores ranged from a high of 27 for Beijing to a low of 3.9 for Yunnan. The Appendix (pp. 34-35) gives the detailed socio-economic variables for the construction of the provincial socio-economic index (SES). The result of the provincial SES is placed in column 6 of table 3.

Then 28 provinces are divided into three groups according to the SES index, representing high, middle and lower levels of socio-economic development. The highest level of the SES index (the first nine provinces from the highest rank of SES index) consists of Beijing, Tianjin, Shanghai, Liaoning, Jilin, Heilongjiang, Guangdong, Jiangsu and Shanxi provinces. The lowest level SES group includes another nine provinces: Yunnan, Qinghai, Guizhou, Gansu, Sichuan, Ningxia, Jiangxi, Shaanxi and Henan. The other 10 provinces represent the middle level of socio-economic development.

Figure 1 shows the patterns of contraceptive use by SES. It is clear that the most and the least developed provinces in China have similar patterns of contraceptive use, and that provinces with middle levels of socio-economic development tend to have another distinct contraceptive pattern. Despite the fact that seven out of nine less developed provinces specified contraceptive methods by birth order in their family planning regulations, both the more and the less developed provinces of China had a relatively high percentage of couples using the IUD and other user-controlled methods, and a relatively low percentage using sterilization. Provinces with mid-level socio-economic development had the highest percentage of sterilization and lowest proportion of couples using other user-controlled methods. This finding suggests that the influence of national guidelines of contraceptive use by birth order were most effective among these provinces.

Table 4 shows patterns of contraceptive use by birth order and SES regions. The methods of contraception are reclassified into six categories: vasectomy, tubal ligation, IUD, pill, condom and others. On average, few men with only one child had a vasectomy. The most astonishing difference exists between married men in the most developed regions and all other regions in using vasectomy as contraception. Hardly any married men in developed regions had a vasectomy regardless of the number of children they had. On the contrary, the percentage of vasectomies increases dramatically in all other regions as the number of children increases. On average, not less than 10 per cent of married men had a vasectomy in these regions. Female sterilization is highest in SES 2 regions and lowest in SES 3 regions. Although SES 1 and SES 3

regions have a relatively lower percentage of sterilization, there exists a significant difference between vasectomy and tubal ligation. The level of socio-economic development and the guidelines of local family planning regulations both may play a role in determining the sterilization patterns of couples in these regions.

The fact that more than 78 per cent of women who had one child were using IUDs clearly reflects the influence of national guidelines on contraceptive use by birth order. About 48 per cent of women in developed regions and 76 per cent of women in SES 2 had undergone sterilization after the birth of their second child. Despite the fact that seven out of nine less developed provinces specified contraceptive use by birth order (first child: IUD, and second child: sterilization), only 36 per cent of the women had undergone sterilization after the birth of the second child. On the one hand, this may reflect the influence of different family planning programmes applied to minority populations. On the other hand, it may also indicate a stronger desire for more children and hence stronger resistance to sterilization in these regions. About 10 per cent of couples in SES 1 and SES 3 regions used other contraceptive methods, but only 7.5 per cent in SES 2 regions did so. As expected, the percentages using any contraception by birth order were highest in SES 1 regions and lowest in SES 3 regions. Finally, it is interesting to note that there are fewer variations in the proportion of couples who answered that their motivation for using any contraception was to respond to the Government's family planning programme. An overwhelming majority of couples indicated that "responding to the Government's call" was their primary reason for using contraception, reflecting the strong and universal influence of the Chinese family planning programme even during the progress of economic reform.

As indicated in table 3, the less developed provinces have a higher proportion of ethnic minority populations where there are different family planning regulations for the minorities. We next analyze the relationships between SES index, contraceptive patterns and proportion of ethnic minority population among the provinces. Table 5 shows the zero-order correlation coefficients of SES, percentage of ethnicity and contraceptive use, by method, of 28 subregions of China in 1988. As expected, the SES index has no significant correlation with any methods of contraception because of the non-linear relation between the contraceptive methods and the level of socio-economic development. The SES index has a strong negative correlation with percentage of ethnic population in the provinces (-0.46) indicating that the higher are the percentages of ethnic minorities in the population, the lower is the level of socio-economic development. The percentage of ethnic minorities also highly correlates with the contraceptive methods used. The provinces with higher percentages of ethnic population are more likely to be associated with lower levels of sterilization (-0.66) and higher levels of use of other means of contraception (0.66). It is apparent that ethnicity plays an important role in less developed provinces in making their contraceptive patterns similar to those of the more developed provinces. Finally, as expected, the SES index has a very strong negative correlation (-0.72) with the provincial level of fertility. The more developed regions are more likely to have a low level of fertility.

The above analysis reveals distinct patterns of contraceptive use in China in 1988. The SES index shows that the most and the least developed provinces have similar contraceptive patterns. The most distinct feature of SES 1 is probably the relatively low level of sterilization and relatively high level of use of the IUD and "other" contraceptive methods. Most provinces in SES 2 are those of the middle level of socio-economic development; they show a high percentage of sterilization followed by IUD, and a relatively low percentage of "other" methods.

The similar pattern of contraceptive use in both the more and the less developed provinces of China suggests different underlying factors in the determinants of contraceptive method choice. Couples in the more developed provinces tend to have higher levels of education, higher social status, better knowledge of different contraceptive methods and, perhaps, access to more efficient distribution and services systems for the family planning programmes. They may thus be in a better position to choose their preferred contraceptive methods and less constrained by the guidelines of family planning programmes. But under the strong influence of the family planning programme, it seems that a majority of them managed to avoid sterilization and to choose the IUD or other methods instead. If the family planning programme continues to become more institutionalized, women may become more knowledgeable about method options and proper use, and may choose different contraceptive methods based on their own personal choices (Kaufman and others, 1989). In other words, the development of Chinese individualism will have a stronger effect on contraceptive method choice for couples in the more developed provinces, since those provinces are more likely to be in a leading position of economic reform.

As mentioned previously, ethnicity is an important factor in determining the patterns of contraceptive use in less developed provinces. Considering the higher level of fertility in those provinces, the low percentage of sterilization and high level of use of the IUD and other methods may reflect a stronger desire for more children among couples in less developed provinces. In spite of the family planning programme regulations

in most less developed regions, which specify the contraceptive methods by birth orders, couples are avoiding sterilization. Unlike the more developed provinces, the demand for more children may be the primary underlying factor in explaining the similar patterns of contraceptive use between those two extreme developmental regions.

## Discussion and conclusion

Economic reform has brought about rapid and more divergent regional development in China. Decentralization in policy implementation and the establishment of private enterprises are two of the most important features of economic reform. As a consequence of reform, the behaviour patterns of the Chinese people have been changing: from passively receiving central authority and sacrificing their own interests to those of the collective and/or the State, to a more aggressive manner of expressing personal interests and emphasizing personal values. In implementation of the family planning programme, although the central guidelines have remained influential during economic reform, decentralized local family planning regulations increasingly deviate from central guidelines.

In examining patterns of contraceptive use, we have found that the most and the least developed provinces of China have similar contraceptive patterns, characterized by a high proportion of IUD and other user-controlled methods and a relatively low percentage of sterilization. Most provinces of the middle level of socio-economic development have similar patterns of contraceptive use, characterized by a high proportion of sterilization and followed by IUDs and a relatively low percentage of other methods. For the more developed provinces, on the one hand, the better distribution and service systems of family planning programmes may contribute to the observed pattern of contraception. On other hand, people in those regions are more likely to choose contraception based on their personal choice instead of following the provider's recommendations. For the less developed provinces with a higher proportion of ethnic minorities in their population, a stronger desire for more children as well as the influence of minority cultures may help to explain the relatively high percentage of respondents using more flexible methods, and the lower percentage of sterilization.

Comparison of patterns of contraceptive use in China with those in some selected Asian countries and areas suggests that the current contraceptive pattern in China (about 90 per cent of users depending on IUDs and sterilization) is in a transition period. With the progress of economic reform, one would expect that the family planning programme would continue to become more institutionalized. Consequently, couples will choose a greater variety of contraceptive methods, instead of following the family planning programme-directed methods, especially under the influence of progressively developing individualism. If this is the case, the Chinese family planning programme in the near future should pay more attention to the quality of care in family planning programmes instead of focusing on the number of contraceptive users or birth control operations. It should focus on providing more method choices, giving more information to clients, strengthening the technical competence of service providers, improving interpersonal relations and appropriating constellation services, as suggested in Bruce's (1990) study of the quality of family planning programmes.

## Footnotes

1. The 10 per cent subsample of the Two-per-thousand Fertility and Birth Control Survey of China 1988 was prepared by the Program on Population, East-West Center, Honolulu, Hawaii.

2. These were Shaanxi, Inner Mongolia, Heilongjiang, Shandong, Henan, Hubei, Hunan, Guangdong, Guangxi, Sichuan, Quizhou, Yunan, Shanxi and Mingxia provinces.

3. Mauldin and Berelson's socio-economic index is constructed for different countries and areas (Mauldin and Berelson, 1978; Mauldin and Ross, 1991). The index used in the present study is applied to provinces in China, so some variables have been modified, e.g. variable 6, gross national product per capita in Mauldin and Berelson, has been changed to gross provincial product per capita in China in 1988.

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## Problems and Prospects of Implants as a Contraceptive Method in Bangladesh

By M. Mujibur Rahman, M. Nurul Islam, Md. Azizul Haque and G.M. Kamal

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Norplant is an acceptable method of family planning and should be made available along with other methods of contraception

The NorplantR implant<sup>1</sup> is a progestin-only hormonal contraceptive method for women. The progestin, i.e. levonorgestrel, is supplied by six small SilasticR (silicone) rods implanted subdermally in a woman's arm by a minor surgical technique. The rods remain effective for at least five years. Removal of them requires surgery similar to that used in their insertion. After removal, normal fertility returns without delay; if continuing contraceptive protection is required, a new set of implants may be inserted immediately. As of mid-1989, an estimated 355,000 women in 44 countries had used or were using this kind of implant.<sup>2</sup>

Norplant has been used in Bangladesh since 1985 when the Bangladesh Fertility Research Programme (BFRP), later renamed the Bangladesh Institute of Research for Promotion of Essential and Reproductive Health and Technologies (BIRPERHT), initiated a clinical trial in 1987 at three medical centres in Dhaka, namely, the Dhaka Medical College Hospital (DMCH), the Institute of Post- Graduate Medicine and Research (IPGMR) and the Mohammedpur Fertility Services and Training Centre (MFSTC). In that trial, Norplant implants were supplied to 681 women. By December 1990, nearly 90 per cent of those women had the implants removed. Of those who had them removed, between 35 and 40 per cent had completed five years of use.<sup>3</sup>

An acceptability study conducted in 1987, after all users had completed their 18-month follow-up, found that the users were quite satisfied with the Norplant implants: 94 per cent of the continuers and 52 per cent of the discontinuers expressed satisfaction with the method. The contraceptive's long duration, efficiency and convenience of use were commonly cited as advantages; bleeding problems were mentioned as the major undesired effect. Of those who had the implants removed within 18 months of insertion, 38 per cent reported that having the implants removed took "little" effort on their part, 52 per cent said it took "some" effort, and 10 per cent said it required "a lot" of effort.<sup>4</sup>

In 1988, the clinical trial was expanded to include, besides the three original centres, four additional centres, namely, the Family Planning Association of Bangladesh (FPAB) at Dhaka and Rangpur, the Bangladesh Association for Voluntary Sterilization (BAVS) at Khulna, and the Thana Health Complex (THC) at Gazaria. By December 1990, a total of 2,654 women had been enrolled in this clinical trial.

In mid-1990, the question of access for removal was raised at two centres. Investigation showed that most removal requests were due to menstrual problems, and that the counselling which the women received was inadequate. It was observed that counselling about the need for a second and third visit was low in almost all the service centres. Although the counsellors do inform the acceptors about the need for the first follow-up, it was found that they were less likely to emphasize the need for subsequent follow-up. Moreover, a good number of acceptors (8 per cent) mentioned not having been counseled about possible side-effects. The donor agency expressed concern about this situation, particularly in the light of plans to expand the use of the Norplant contraceptive nationwide - initially to 20,000 women through 32 centres -- and the impact that this situation could have on the willingness of women to use a method over which they felt they did not exercise control. As the use of the Norplant contraceptive expands into Bangladesh's national family planning programme, careful attention must be given to ensuring high quality implant services, particularly counselling and management of side-effects. Also, there is a need for assuring women, especially those who wish to have the implants removed before five years of use have elapsed, that they will have access to trained service providers for removing the implants. The programme runs the risk of being accused of forcing women to keep the implants against their wishes if women perceive that they do not have full access to services for removal.

The main purpose of this study was to assess the quality of service provision, particularly as it was related to access for removal of the implants. The specific objectives were:

- To examine the decision-making process vis-a-vis accepting the Norplant contraceptive;

- To ascertain the extent and quality of counselling and follow-up as well as any problems associated with insertion services;
- To assess the reasons for removal, and assess the removal services; and
- To assess the level of satisfaction and future intention to use the Norplant contraceptive.
- Data and methods

Half of the implant acceptors from each of the seven centres currently offering the Norplant contraceptive were randomly selected from the client registers maintained by those centres. Out of a total of 2,654 insertions, a total of 1,327 acceptors were thus selected. Acceptors were defined as those who had had Norplant implants inserted through December 1990, excluding those who received the implants from the three centres in the initial phase.

A structured questionnaire was used for collecting data from the implant acceptors who reported that they had requested removal of the implants and had difficulty in having them removed. Trained interviewers of the Associates for Community and Population Research Management (Dhaka) conducted open-ended interviews with these women to elicit detailed information on the problems related to removal. Field work was conducted between 7 September and 10 November 1991. Of the selected acceptors, nearly 13 per cent could not be successfully interviewed. The major reason for non-response was that the acceptors could not be located at the addresses listed in the centres' register. Thus, out of a total of 1,327 selected clients, 1,151 clients were successfully interviewed and included in the analysis.

## Results

### Background characteristics of acceptors

As regards the socio-demographic characteristics of the implant acceptors, it was observed that the mean age of the acceptors was 28.6 years and their mean number of living children was 3.1 at the time of interview. Two-thirds of the acceptors did not desire to have any more children and another 14 per cent were undecided on whether to have an additional child or not. Only 9 per cent said that they desired to have another child during the next 1-4 years. This finding suggests that Norplant is regarded as a terminal method for most acceptors. However, for about one-fifth of them, they considered it a spacing method (table not shown).

Regarding the educational and residential status of the acceptors, it was observed that three-fifths of them (59 per cent) had no education, slightly over one-fourth (28 per cent) had some education, and only 13 per cent had education above the primary level. Nearly three-fourths of the implant acceptors were from rural areas and one-fifth were from either urban residential (16 per cent) or slum areas (4 per cent); the remaining 6 per cent were from suburban areas (table not shown). Since the Norplant system is a long-acting contraceptive, the characteristics of its acceptors are likely to be more comparable with those of similar methods such as the IUD (intrauterine device) and, to some extent, tubectomy. Selected characteristics of acceptors of implants, IUDs and tubectomy were compared for three variables, namely, age, parity and education, because these variables are believed to influence the contraceptive behaviour of Bangladeshi women.

It was observed that the IUD acceptors were drawn from more educated, younger and lower parity women, whereas Norplant acceptors comprised relatively less educated, middle-aged women of average parity. Bangladeshi tubectomy acceptors seemed to be characterized by illiteracy, higher age and high parity (table not shown).

### Decision-making process

The decision to accept the implants was likely to have been influenced mostly by the clinical staff of the aforementioned centres since the clinical trial was based on the selection of clients motivated to attend the clinic for some other method of contraception and not on referral of clients by field workers. Here we consider the factors influencing women's choice in the use of implants, including their knowledge and use of other methods of family planning and the sources of information regarding the Norplant method.

The study revealed that the implant acceptors were universally aware of the main options of contraception and the sources of supply of contraceptives. It was found that two-thirds (67 per cent) of the implant acceptors had ever used any other method prior to use of Norplant. Nearly three-fifths (56 per cent) had used the pill. Among other methods used were injectables (16 per cent), IUDs (14 per cent) and condoms (12 per cent). In terms of knowledge and use of other family planning methods, there was a similarity between the IUD users and implant acceptors, except that the proportion of women having ever used any

other method prior to use of an IUD or Norplant was slightly higher for IUD users (75 per cent) than for the implant acceptors (65 per cent) (table not shown). This suggests that the Norplant contraceptive is not typically the first method that Bangladeshi women are using; the vast majority of the acceptors had prior experience with other forms of contraception.

As regards the factors influencing the decision to accept the Norplant method, women were asked about their sources of information, topics they discussed and reasons for their preference of the implant over other methods. Contrary to expectation, past users of this method were the single most important source of information about Norplant (61 per cent), followed by "worker in home" (20 per cent) and "worker in clinic" (13 per cent) (see table 1).

The same table shows that, prior to acceptance, most implant acceptors had discussed the matter with their husbands (81 per cent) and with other users (74 per cent). About one-fourth of the acceptors mentioned that they had discussed the Norplant contraceptive with a family planning worker before deciding to undergo the minor surgery to insert this method.

The table also shows that a wide range of topics were discussed by the clients prior to acceptance. Two-fifths of the acceptors mentioned that the discussion included getting the consent of their husbands. Discussions centred mostly on "advantage of Norplant implants" (50 per cent), "whether there would be pain in the arm" (46 per cent), "effective duration" (36 per cent), "any problem in doing household work" (30 per cent) and "where is it inserted" (23 per cent). Other areas of interest discussed were "disadvantages or side-effects" (17 per cent), "where available" and "whether it can be removed in case of any problem" (15 per cent).

Regarding the reasons for choosing the implant contraceptive over other family planning methods, it was observed that the most frequently mentioned reason was that the "Norplant contraceptive is a long-term method" (86 per cent), followed by "other methods have side-effects" (46 per cent), "Norplant implants have fewer side-effects" (25 per cent), and "other methods are hazardous to use" (24 per cent). One-fifth of the acceptors mentioned that they had decided to use the implant method because they were advised to do so by clinic staff, family planning workers, or by another Norplant users (table 2).

#### Counselling and follow-up service

Counselling may be defined as "face-to-face communication in which one person helps another to make decisions and to act on them".<sup>5</sup> Past studies in Bangladesh have shown that client satisfaction is positively associated with counselling, and thereby influences the continuation rate of family planning methods. Moreover, anticipatory counseling on probable side-effects and what to do in the case of complications also influence the rate of continuation.<sup>6</sup> Despite all these positive influences, counselling is inadequately done in most clinics dealing with maternal and child health (MCH) and family planning clients in Bangladesh. Ideally, counselling should be provided before, during and after the insertion of the implant. It is important to note that unlike usual MCH and family planning clinics where the provider herself provides both counselling and insertion services, all the Norplant contraceptive centres have separate counsellors.

It was observed that all of the implant acceptors were counseled on effective duration, need for follow-up, possible side-effects and their management, and when to report for removal. Four-fifths of the acceptors reported that the physician or the counsellor was the source of counselling. Less than half mentioned that Norplant users counseled them, while another one-fifth (19 per cent) mentioned the family planning worker as a source of counselling (table 3).

During observations at the clinic it was found that standardized messages for follow-up requirements were well documented at each clinic, and the counsellors reported that these messages were properly provided during counselling. Findings presented in table 3 show that 89 per cent of the acceptors knew that the first follow-up visit was one month after insertion, 61 per cent said that the second visit was after 5-8 months, and 55 per cent knew that the third visit was after one year, and that the fourth visit was after two years.

Lack of 100 per cent recall may reflect on the memory lapses of the acceptors more than on any negligence by the counselors. Only 8 per cent of the acceptors mentioned not having been counseled about possible side-effects. However, most (91 per cent) mentioned that they were informed about possible menstrual irregularities. Other aspects on which anticipatory counseling was given included "not to worry, problems will automatically go away" (19 per cent) and "dizziness/nausea/headache" (16 per cent) (table not shown).

As regards the follow-up services, implant clients were given a short version of the client card; detailed information was retained on the clinical card. The dates of insertion and subsequent visits were recorded on

the clients card along with a short description of side-effects/complications and treatment given. Irrespective of the mean number of times the acceptors had returned to the clinic, it was observed that the visits for follow-up were considerably higher than the recommended number during the first year, but the reverse was true after the first year. After the initial six months of use, the implant acceptors seemed to settle down in terms of noticing side-effects and complications. It was also observed that two-thirds of the acceptors were never late in reporting to their clinic for follow-up. The reasons for delay among the remaining one-third were varied; they included such responses as "busy with household work" (29 per cent), "lack of money" (15 per cent), "went to village/paternal home" (13 per cent), "no one to accompany" (12 per cent), "bad communication/centre is far away" (8 per cent), "sickness/illness" (8 per cent), and "forgot the date" (7 per cent) (table not shown).

Life table techniques were used to calculate the continuation rate of implant use, or the proportions of acceptors still using implants at specified durations after insertion. It was observed that three months after insertion 99 per cent of the acceptors were still using the implants. The proportion declined slightly to 97 per cent after six months, to 95 per cent after nine months, and to 92 per cent at the end of one year. The two-year retention rate was 75 per cent and the three-year rate was 61 per cent (table 4). Results of the study conducted by BIRPERHT at the end of 36 months of the first phase clinical trial estimated the continuation rate at the end of 12, 24 and 36 months at 94, 72 and 56 per cent, respectively.<sup>7</sup>

It was also observed that there were wide variations in the continuation rates among different countries. However, the continuation rates in Bangladesh were similar to those of other Asian countries, i.e. China, Indonesia, Sri Lanka and Thailand. The continuation rates were relatively lower in North and South American countries, except for Chile (table 5).

Analysis was also performed to examine variations in the retention rates by individual characteristics of acceptors. Age, number of living children and education appeared to be significant variables in this regard. Functional impairment owing to side-effects or complications was also highly correlated with levels of retention.

The level of satisfaction with the services is another important factor which was found to be highly correlated with retention rates. Women who were "highly satisfied" or "satisfied" were more likely to use the implant method for a longer time than those who were either "somewhat satisfied" or "not at all satisfied". The retention rate sharply declined from those who were "highly satisfied" (77 per cent) to those who were "somewhat satisfied" (53 per cent), and to those who were "not at all satisfied" (36 per cent) (table 6).

#### Implant removal services

All of the physicians interviewed were experienced in the removal of Norplant. When clients requested removal, the physicians would generally ask them about their reasons for wanting the implants removed. If the woman's problem could be resolved without removal, the service providers would attempt to do so. None of the physicians interviewed said that he or she had refused a request for removal. For those clients who had retained the implants for five years, the clinic sent them a letter or a message through a family planning worker to return for removal, if the clients themselves had not already come to the clinic seeking removal.

One-third of the total acceptors had requested removal by the time of the interview. The single most important reason for removal was menstrual disorders. This was mentioned by two-thirds of those requesting removal; 9 per cent of the acceptors had the device removed because they wanted more children and 7 per cent because their husbands either had died or gone abroad. Only 6 per cent wanted the implants removed because of "dizziness/loss of appetite". "Other reasons" accounted for the remaining 13 per cent of users (table not shown).

For most women in Bangladesh using Norplant, access for removal is not a problem. In the seven centres, 90 per cent of the women who requested removal were able to have the implants removed at the same centre where the implants were inserted. However, among the remaining one-tenth of acceptors who had the implants removed, they felt compelled to have them removed at a place or by a person other than at the centre where it was inserted: those acceptors mentioned as their reason that the clinic had refused to remove the device. No centre could be singled out: almost all the centres were mentioned in this regard by those women who wanted the removal done elsewhere. Other reasons cited by the clients were: "wanted 5,000 taka" (US\$1 = about 40 taka), "doctor was absent", "clinic is far away" and "clinic staff gave no importance to request". Four-fifths of the acceptors who had their implants removed said that they experienced no problems. About one-tenth said that it was a very painful procedure and 4 per cent reported a lot of bleeding. Nearly half of the acceptors having the implants removed mentioned that Norplant was

removed at their first request, 22 per cent had to go twice seeking removal, and 15 per cent had to go three times (table not shown).

Usually, when a removal is requested, the staff of the clinic try to ascertain the reason for removal and to determine whether removal is actually necessary or not. If, in their judgement, removal is not warranted, they usually advise the acceptors to retain the device and also prescribe or give any necessary medication. Most of the acceptors (85 per cent) were satisfied with the services related to removal. Thus, it may be said that not too many clients were dissatisfied with the clinics. However, in view of the newness of the device in Bangladesh and the non-availability of trained personnel to perform the removals, other than from those trained in the selected clinical trial, it is extremely important to understand the reasons why 10 per cent of the women stated that they were not given the service they requested (removal), some even after repeated requests.

It is worth noting that, of those having the implants removed, 48 per cent were not using any contraceptive at the time of the interview; the rest were using mostly oral pills (34 per cent), followed in frequency by traditional methods (8 per cent) and injectables (5 per cent). Four-fifths of the acceptors who were not using any contraceptive method after removal of the implants, excluding those desiring more children, said that they were not counseled by the clinical staff; the remaining one-fifth mentioned that they had been advised by clinical staff to use other methods or have the Norplants inserted again (table not shown). Thus, it appears that the majority of those who had removals but who did not desire to have additional children were not counseled to use another method of contraception despite being at risk of getting pregnant.

#### Satisfaction with services and future intention to use

An analysis was conducted to assess the clients' satisfaction with services, i.e. to determine whether or not the clients had experienced any problems and the type of follow-up they had received. Even among those clients who had experienced a functional impairment, 71 per cent were satisfied or highly satisfied with the services they had received. An additional 22 per cent were at least somewhat satisfied. The results were similar among women who had experienced side-effects but no functional impairment (table not shown).

Regarding satisfaction with services, most of the women (88 per cent) were "satisfied" or "highly satisfied" with the services they received; an additional 10 per cent were at least "somewhat satisfied" with the services. Only 2 per cent of the clients were "not at all satisfied" (table not shown).

Clients who were visited at home in addition to having visited the clinic were slightly more likely to be "satisfied" or "highly satisfied" (92 per cent) than were women who had visited the clinic only (table not shown). These findings indicate that field workers and clinical staff who visit women in their homes could potentially provide reassurance and assistance to implants users.

Clients were also asked about their intention regarding future use of Norplant. Two-thirds of the women who were currently using the implants said that they would use this method again in the future, while 24 per cent were not sure; 10 per cent of the women said they did not plan to use the implants again. Of those who were not currently using Norplant, the situation was reversed - almost three-fourths of them said that they had no intention of using implants in the future; 11 per cent said they were not sure and 15 per cent said they would use implants again. Of the current users of Norplant who said they did not intend to use implants in the future, 42 per cent said they would wait until they had removed their current implants before deciding on future use. An additional 16 per cent said that they were currently experiencing side-effects; if those side-effects went away, they would consider future use of Norplant. Twelve per cent said that they would not use the implants in the future owing to the menstrual disorders they experienced during use (see table 7).

#### Conclusion

The study revealed that Norplant users in the clinical trial were, on average, 28.6 years old with 3.1 children; two-thirds wanted no more children. Three-fifths of the women had no education and three-fourths were from rural areas. All of the women knew at least one other method of contraception, and 67 per cent had used family planning before accepting Norplant. Most clients were satisfied with this contraceptive method and with the services they received. The most appealing aspect of the method for 86 per cent of the new users was Norplant's long duration of effectiveness. The 18-month continuation rate of Norplant appeared to be higher than that of IUDs. Of current implant users, 66 per cent said they would use the implants again in the future and another 24 per cent said they were undecided. Only about 10 per cent of the women were "most dissatisfied" with the services they received, and their criticisms of the programme appeared to be justified.

For the women who had side-effects or complications, and who requested removal but were refused this service by the clinics -- sometimes even after repeated requests -- the system set up to provide this contraceptive method failed them. It is not possible to determine exactly why some clients had such difficulty while most others had their implants removed promptly. However, it should be stressed that such problems with removal might have been isolated cases.

Nevertheless, this study has highlighted several aspects of the Norplant contraceptive service delivery system which should be strengthened in order to ensure that all women are accorded an acceptable level of good-quality service, and that all women have full access to removal of the implants. This process should be overseen by a steering committee comprising representatives of governmental and non-governmental organizations.

The Norplant contraceptive programme will require strong monitoring and evaluation, particularly during the Norplant pre- introductory pilot phase (NPIPP). In addition to monitoring service delivery sites, an annual evaluation should be conducted to assess the quality of services and, particularly, to assess the removal services. In addition, NPIPP represents an ideal period to conduct operations research to test mechanisms to improve the delivery of the Norplant services within the family planning programme.

We can, therefore, conclude that the Norplant contraceptive is an acceptable method of family planning and should be made available to the women of Bangladesh along with other methods of contraception.

#### Footnotes

1. Norplant is a registered trademark of the Population Council, Inc., for contraceptive subdermal implants.
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Role of Government Family Planning Workers and Health Centres as Determinants of Contraceptive Use in Bangladesh (Demographers' Notebook)

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The use of contraceptives in Bangladesh has risen steadily over the last two decades. In 1975, the contraceptive prevalence rate (CPR) was 8 per cent and rose to 40 per cent in 1991. The country experienced the steepest increase in CPR between 1975 and 1985: the rates rose from 8 per cent to 25 per cent, a more than three-fold increase in only 10 years.

From a total fertility rate (TFR) of almost 7.0 births per woman in the 1980s, TFR fell to almost 5.0 in the early 1990s, a decline of 28 per cent in a single decade. Demographers have attributed this change in TFR to a decline in marital fertility and the success of the family planning programme rather than rising age at marriage (Huq and Cleland, 1990). The decline has been uniform for all strata of people. Further, the poverty-fertility link is at odds with the evidence (Cleland, Phillips, Amin and Kamal, 1991).

The introduction of grassroots-level female family planning workers, i.e. family welfare assistants (FWAs), in 1978 caused a dramatic shift in the CPR. These FWAs are young, educated female workers recruited by the Government of Bangladesh from local areas; they offer services at the doorstep to women nationwide. Each FWA is assigned to a geographical area comprising approximately 4,000 women (Koenig and others, 1992); however, FWAs are not present in every rural cluster. The role of the FWA is to visit each household in her area that has an eligible woman and encourage that woman to use family planning methods if she does not yet know of the benefits of family planning, or to provide advice and supplies of the method that the woman prefers to use. In very remote areas of Bangladesh, these FWAs are the only contacts with the family planning programme that village women ever have. The FWA is expected to visit every woman in her area at least once every two months; however, the remoteness of some rural areas and other constraints make it impossible to reach every woman in the country. In certain instances, the FWA has to refer her clients to a satellite clinic in her area. Satellite clinics are located in areas where there is a high demand for the insertion of IUDs, or for sterilization. The other alternative is for the FWA to refer the patient to the nearest family welfare centre (FWC). Also constructed by the Government, FWCs are available in only a few clusters in Bangladesh. (In the full paper by the author of this note, the predictive power of the presence of an FWA and FWC in a cluster is assessed as it relates to the contraceptive use of Bangladeshi women, over and above the effects of other socio- economic and demographic background factors.)

This analysis considers 7,764 women resident in rural areas; the data were obtained from the 1989 Bangladesh Fertility Survey (BFS). The analysis is confined to rural women since the community variables, presence of an FWA and FWC in the cluster, were collected for rural clusters only. The data were collected using a two-staged sampling method. (Two models are considered in the full paper: modern reversible methods, and male and female sterilization.) Since sterilization is a permanent method, couples may have a different set of predictor variables, thus necessitating a separate model. The modern reversible methods include the oral pill, condom, IUD and foam. Pregnant women were classified as non- users.

The principal independent variables are presence of an FWA and an FWC in a cluster. These variables are cluster-specific and are therefore separate from other additional variables which are individual ones. These include age, parity, socio-economic score, geographical area of residence and religiosity. To examine the effect of the presence of an FWC and FWA on contraceptive use, a logistic regression model was used. Two different models were constructed: one for modern reversible method users and one for sterilization acceptors.

The analysis showed that women in Chittagong have a 42 per cent lower probability of use and women in Rajshahi have a 65 per cent higher probability of use compared with women in Dhaka; for women in Khulna, there is no difference in probability of use. Whereas religiosity has no significant effect in determining the use of modern reversible methods, the presence of an FWA increases by 54 per cent the probability of a rural woman being a user. It also accounts for more than one-third of the inter-cluster variation. The presence of an FWC in the cluster does not have any significant effect on modern method use, and it does not explain any inter-cluster variation. The results match the findings of previous research. Koblinsky (1989) and Phillips (1985) found that visits by the FWA lead to increased use. Koenig and

others (1992) remarked that static FWCs did not contribute to increased use in the Matlab comparison area. This analysis also concludes that static FWCs in Bangladesh are not significant predictors of contraceptive use. Cleland and others (1991) remarked: "There is unassailable evidence that routine household visits by family planning workers can have a lasting impact on reproductive behavior", and "A visit to a health center for treatment of a sick child or to obtain family planning supplies is a major feat of logistics and persuasion" for a Bangladeshi woman.

It is, therefore, not surprising that the FWA is a significant predictor of contraceptive use whereas the FWC is not. This leads to the conclusion that "doorstep" services are very important in Bangladesh (Cleland and others, 1991). It also implies that the introduction of the FWAs has been a successful addition to the family planning programme. Since Bangladesh is a male-dominated, predominantly Muslim country, it is highly unlikely that women will voluntarily seek family planning methods, even if they are made available by the existence of FWCs close to where women live.

Firstly, the issue of contraception is considered to be extremely private and confidential, and women in rural Bangladesh would feel shy to express a desire to limit family size. This is more so because a woman cannot visit the health centre on her own. Conservative social values do not allow a woman to visit any place on her own without a male escort. Older women are more likely to have greater freedom and may be seen in public accompanied by their children, but young women (below 30 years of age) are expected to be out of the public eye or even practice purdah (covering with a veil) when in public. Prior to the introduction of FWAs, the Government employed male family planning workers and installed FWCs in various villages from 1969 to 1978. The existence of family planning facilities or the knowledge of family planning were not enough to motivate rural women to use contraception. It was only after the introduction of the FWAs in 1978 that the family planning programme gained momentum and the CPR began to rise and TFR decline.

It is not the location of the FWCs or the distance that women must travel to reach one of them that impedes the women from using the services offered by the FWCs. An understanding of women's role in a conservative Muslim society can explain the reason why a woman will not seek assistance, even if she feels motivated to use contraceptives and knows that an FWC is situated nearby. One study by Kamal and Sloggett (1993) shows that use of modern methods increases gradually as women's autonomy in the family and her mobility improves.

In the initial days of their recruitment, young educated FWAs faced much resistance from society. They were branded as "characterless", evil women who worked with men, did not observe purdah, and advocated something that was totally against God's will. Over the years, the gradual diffusion of ideas has brought about a change in attitude and today the FWAs occupy a special respectable position in village society (Simons and others, 1992). Caldwell and others (1992) remarked about the success of family planning in Bangladesh by saying: "The only adequate explanation is the legitimisation of the concept of the small family and of contraceptive use, and the greater diffusion of the idea that controlling family size may prove to be economically advantageous".

As for sterilization, the multilevel logistic regression model showed that, as expected, older women are more likely to be acceptors of sterilization compared with younger women (below 30 years of age). It also showed that women in higher parity groups are more likely to accept sterilization. However, there is a drop in probability from women with parity 3 or 4 to women with a parity of 5 and above, which could be because women in that age group (parity 5 and above) have already completed their childbearing, perhaps more in the social than biological sense.

Rahman (1984) remarked that in rural Bangladesh, women who are already grandmothers would consider it shameful to bear children. Being a grandmother in Bangladesh does not imply being in an old-age group. The age at first marriage in Bangladesh can be as low as 12 or 13 years, so many women in parity 5 who have married daughters and grandchildren may be relatively young. After age 30 and parity 5, the majority of women cease to have active conjugal relationships. As a result, they do not feel the need to use contraceptives to limit their fertility, although they are still married. Therefore, women who are currently in parity 3 or 4 are more likely to limit fertility than women in parity 5 or above, because they are still likely to be in an active sexual relationship and, being in a younger age group, are more likely to accept fertility-limiting measures. This is because the motivation to adopt family planning and the technologies for this purpose have been quite recent in Bangladesh, and more women in the younger age groups have responded positively to family planning. In any population, the diffusion of new ideas and technologies usually begins with the younger generation. That indeed has been the case in Bangladesh, as has been remarked by Huq and others (1990) in their initial analysis of 1989 BFS data.

Women in lower socio-economic groups are more probable acceptors of sterilization, whereas women in higher socio-economic groups opt for modern reversible methods. In Bangladesh, couples receive a

compensation payment of approximately US\$4 for being sterilized. The attractiveness of this cash payment has been especially attractive to couples living in poor economic conditions (Cleland and Mauldin, 1991).

Religiosity plays a strong role in the acceptance of sterilization, as opposed to the use of modern reversible methods. Women who are less religious have a higher (43 per cent) probability of being an acceptor compared with those who are strictly religious. Women who consider themselves average in terms of religiosity do not differ from their more religious counterparts. In a predominantly Muslim society like Bangladesh, this differential is not at all surprising.

Strict religiosity has often been identified as an impediment towards the adoption of contraception. Bernhart and others (1990) remarked that religious beliefs are widely perceived and practised in Bangladesh, but there was no association between contraceptive use and devoutness. However, that study was limited because of its small sample size. (The data used by the author of this note, which are nationally representative, show that, after controlling various demographic and socio-economic attributes, decreased devoutness of a woman leads to increased acceptance of sterilization.) Compared with Dhaka Division, Chittagong Division had a 55 per cent lower probability of adoption of sterilization, and Rajshahi Division had a 36 per cent higher probability; for women in Khulna, adoption of sterilization did not differ significantly.

The presence of an FWA in a rural cluster increased by 66 per cent the probability of a couple being an acceptor of sterilization. As with modern methods, the presence of an FWA explained more than one-third of the inter-cluster variation in the model. But the presence of an upazila-level family welfare centre (FWC) had no significant effect on the acceptance of sterilization, nor did it explain any fraction of the inter-cluster variation.

### Conclusion and policy implications

Increasing the number of FWCs in the clusters might not be fruitful in attempting to improve CPRs in Bangladesh. A more positive input might be to increase the number of FWAs in rural areas by recruiting FWAs for every cluster. Enabling FWAs to visit each eligible woman once a month instead of once in two months, as well as increasing the effective time spent with each client would be beneficial. Although the FWAs have been successful in their work, there are various areas of Bangladesh where women have had very few visits or none at all from FWAs in the previous six months. In particular, Chittagong Division deserves mention because of its lower than average CPR. The 1991 Contraceptive Prevalence Survey (CPS) revealed that only one-fourth of the women in that District were visited by FWAs compared with two-fifths of the women in the three other divisions (Mitra and others, 1992). The Government could attempt to reach higher targets for field-worker visitation during the next five years. Increasing the frequency of visits and the number of FWAs, and providing better incentives and facilities for FWAs in the future would likely raise the CPR and make a major contribution towards achieving replacement-level fertility by the year 2000.

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A strategy to stabilize world population growth and achieve sustainable development by addressing reproductive health needs, rights and responsibilities of individuals was adopted by the International Conference on Population and Development (ICPD) as it concluded its nine-day meeting at Cairo on 13 September 1994.

The 16-chapter Programme of Action of the Conference emphasizes the imperatives of empowering women and guaranteeing choice in regard to family planning and stresses that advancing gender equality and ensuring women's ability to control their own fertility are "cornerstones of population and development-related programmes". It contains "break-through" language concerning reproductive health and reproductive rights -- a concept based on the recognition of the basic right of all couples and individuals to decide freely and responsibly the number, spacing and timing of their children and to have the information and means to do so.

The adoption of the Cairo Programme of Action, which was negotiated in the Main Committee of the Conference, was the culmination of five years of preparations, following a decision by the Economic and Social Council to convene the Conference in 1994.

The Preamble of the Programme of Action, Chapter I, provides an overview of the main issues. It states that never before has the world community had so many resources, so much knowledge and such powerful technologies at its disposal which, if suitably redirected, could foster sustained economic growth and sustainable development. There is emerging global consensus on the need for increased international cooperation on population in the context of sustainable development. Much has been achieved in that regard, but more needs to be done.

The world population is currently estimated at 5.6 billion, the Preamble continues. The low, medium and high variants of the United Nations population projections for the coming 20 years range from a low of 7.1 billion people to the medium variant of 7.5 billion and a high of 7.8 billion. Implementation of the goals and objectives of the Programme of Action will result in world population growth, during the next two decades and beyond, at levels below the United Nations medium projection.

The world as a whole has changed in ways that create important new opportunities for addressing population and development issues, the Preamble states. Major shifts in attitude were witnessed on reproductive health, family planning and population growth, resulting in the new comprehensive concept of sexual and reproductive health, including family planning and sexual health, as defined in the Programme of Action. Its objectives and actions will collectively address the critical challenges and interrelationships between population and sustained economic growth in the context of sustainable development. In order to do so, adequate mobilization of resources at the national and international level will be required, as well as new and additional resources, to the developing countries from all available funding mechanisms.

The Preamble further states that the two decades ahead are likely to produce a further shift of rural populations to urban areas, as well as continued high levels of migration between countries. Those migrations are an important part of the economic transformations occurring around the world, and they present serious new challenges. Those issues must, therefore, be more emphatically addressed in population and development policies.

The recommendations for action are made in a spirit of consensus and international cooperation, recognizing that the formulation and implementation of population policies is the responsibility of each country and should take into account the economic, social, environmental and cultural diversity of conditions in each country, including religious beliefs and ethical values. Those recommendations include a set of important population and development objectives, including both qualitative and quantitative goals that are mutually supporting and of critical importance, including the goals of education, especially for girls; gender equity and equality; infant, child and maternal mortality reduction; and the provision of universal access to reproductive health services, including family planning and sexual health.

Many of the quantitative and qualitative goals of the Programme clearly require additional resources, some of which could become available from a reordering of priorities at the individual, national and international levels. However, none of the actions required -- nor all of them combined -- is expensive in the context of either current global development or military expenditures. A few would require little or no additional financial resources, in that they involve changes in life-styles, social norms or government policies that can be largely sustained through greater citizen action and political leadership. But to meet the resource needs of those actions that do require increased expenditures over the next two decades, additional commitments will be required on the part of both developing and developed countries.

The Preamble's concludes: "While the International Conference on Population and Development does not create any

new international human right, it affirms the application of universally recognized human rights standards to all aspects of population programmes. The Programme of Action will require the establishment of common ground which recognizes and honours the broad diversity of religious and cultural values. The impact of this Conference will be measured by the strength of the specific commitments made here and the consequent actions to fulfil them, as part of a new global partnership among all the world's countries and people, based on a sense of shared but differentiated responsibility for each other and for our planetary home".

Chapter II contains a total of 15 principles addressing issues relevant to population and development matters. The wording of most principles is taken or derived from various international instruments; others are new, including the proposition that "advancing gender equality and equity and the empowerment of women, and the elimination of all kinds of violence against women, and ensuring women's ability to control their own fertility, are cornerstones of population and development-related programmes".

An introduction to the chapter on principles states that the implementation of the recommendations contained in the Programme of Action is the sovereign right of each country, consistent with national laws and development priorities, with full respect for the various religious and ethical values and cultural backgrounds of its people, and in conformity with universally recognized international human rights.

Among the 15 principles is one asserting that human beings are at the centre of concerns for sustainable development and are the most important and valuable resource of any nation. The right to development is a universal and inalienable right and an integral part of fundamental human rights. While development facilitates the enjoyment of all human rights, lack of development may not be invoked to justify the abridgement of internationally recognized human rights.

The Conference affirmed that to achieve sustainable development, States should reduce and eliminate unsustainable patterns of production and consumption, and promote appropriate policies, including demographic policies, in order to meet the needs of current generations without compromising the ability of future generations to meet their own needs. All States and people should cooperate in the essential task of eradicating poverty as an indispensable requirement for sustainable development, in order to decrease the disparities in standards of living and better meet the needs of the majority of the people of the world.

Everyone has the right to the enjoyment of the highest attainable standard of physical and mental health, the chapter continues. States should take all appropriate measures to ensure, on a basis of equality of men and women, universal access to health-care services, including those related to reproductive health care, which includes family planning and sexual health-care programmes. Those programmes must provide the widest range of services without any form of coercion. All couples and individuals have the basic right to decide, freely and responsibly, on the number and spacing of their children, and to have information, education and the means to do so.

The family is the basic unit of society, according to another principle. In different social, cultural and political systems, various forms of the family exist. Marriage must be entered into with the free consent of the intending spouses, and husband and wife should be equal partners. Everyone has the right to education, which shall be directed to the full development of human resources and human dignity and potential, with particular attention to women and girls. The best interests of the child should be the guiding principle of those responsible for his or her education and guidance; that responsibility lies, in the first place, with the parents.

Countries receiving documented migrants should provide proper treatment and adequate social welfare services for them and their families, and should ensure their physical safety and security, the chapter states. Countries should guarantee to all migrants all basic human rights. All States have responsibilities with respect to refugees, as described in the Geneva Convention on the Status of Refugees and its 1967 Protocol. In considering the population and development needs of indigenous people, States should recognize and support their identity, culture and interests. All countries should recognize their common but differentiated responsibilities, the last principle states. The developed countries acknowledge the responsibility they bear in the international pursuit of sustainable development, and should continue their efforts to promote sustained growth and to narrow imbalances in a manner that can benefit all countries, particularly the developing countries.

Chapter III addresses the interrelationships between population, sustained economic growth and sustainable development. It notes that macro-economic and sectoral policies rarely pay attention to population considerations. Explicit integration of population into economic and development strategies would both hasten the pace of sustainable development and poverty alleviation and contribute to the achievement of population objectives and an improved quality of life.

Actions recommended include the establishment by Governments of institutional mechanisms to ensure that population factors are addressed by all agencies responsible for environmental, social and economic policies and programmes. Public information and education programmes should receive increased resources through cooperation

among Governments, non-governmental organizations and the private sector. Eradication of poverty would contribute to slowing population growth and achieving early population stabilization. The text calls for particular attention to be given to the socio-economic improvement of poor women in developed and in developing countries. Eliminating social, cultural, political and economic discrimination against women is a prerequisite for eradicating poverty.

It recommends that job creation in the industrial, agricultural and service sectors should be facilitated by Governments and the private sectors through the establishment of a more favourable climate for expanded trade and investment on an environmentally sound basis, greater investment in human resources development and the development of democratic institutions and good governance.

With respect to population and the environment, it recommends integrating demographic factors into environment impact assessments and other processes aimed at achieving sustainable development. Among measures aimed at the eradication of poverty, special attention should be given to income-generation and employment strategies directed at the rural poor and those living in fragile ecosystems. Policies should address the ecological implications of future increases in population numbers and other demographic changes.

Proposals concerning gender equality, equity and the empowerment of women are dealt with in Chapter IV. It states that actions to improve women's access to secure livelihoods and economic resources are needed, and their enormous responsibilities with regard to housework should be alleviated. Improving the status of women would enhance their decision-making capacity, which is essential to the long-term success of population programmes. Education is critical to empowering women. More than one-third of the world's adults, most of them women, have no access to printed knowledge, to new skills or to technologies that would improve the quality of their lives and help them adapt to change.

Countries should take steps to eliminate inequalities between men and women by establishing mechanisms for women's equal participation and equitable representation at all levels of the political process. Women's ability to earn income beyond traditional occupations should be facilitated through appropriate measures. Countries should act to eliminate violence against women. Discriminatory practices by employers against women, including those based on pregnancy status, should also be eliminated. Measures should be taken to enable women to combine the roles of child-bearing, breast-feeding and child-rearing with participation in the workforce.

Further, Governments are asked to ensure that women's property rights are equal to those of men. Countries should prohibit degrading practices such as exploitation through prostitution, with special attention to vulnerable groups such as migrant women, women in domestic service and schoolgirls. Countries are urged to condemn the systematic practice of rape and other forms of inhuman and degrading treatment of women as a deliberate instrument of war and "ethnic cleansing", and take steps to assure that full assistance is provided to the victims of such abuse for their rehabilitation.

Addressing the issue of the girl child, the Programme of Action notes that in all societies, discrimination based on sex often starts at the earlier stages of life. Practices such as prenatal sex selection and higher mortality rates of girls suggest that "son preference" is curtailing the access of girls to food, education and health care. It calls for special education and public information efforts to promote equal treatment of girls and boys with respect to nutrition, health care, education and social, economic and political activity, as well as equitable inheritance rights.

Beyond the achievement of the goal of universal primary education in all countries before the year 2015, all countries are urged to ensure the widest and earliest possible access by girls and women to secondary and higher levels of education. Governments should strictly enforce laws to ensure that marriage is entered into only with the full and free consent of those concerned. The minimum marriage age should be raised when necessary. Further, Governments are urged to prohibit female genital mutilation wherever it exists. Measures should be taken to prevent infanticide, prenatal sex selection, trafficking in girls and the use of girls in prostitution and pornography.

Concerning men's responsibilities and participation, the Programme stresses that men can play a key role in bringing about gender equality since, in most societies, men exercise power in nearly every sphere of life. Actions recommended include the equal participation of women and men in all areas of family and household responsibilities through such means as family leave for men. Special efforts should be made to emphasize men's shared responsibility and promote their active involvement in responsible parenthood. Governments should enforce child-support laws and should consider changes aimed at ensuring men's financial support for their families. The safety of women in abusive relationships should be protected. Schools should ensure that attitudes respectful of females as equals are instilled in boys. Relevant programmes to reach boys before they are sexually active are urgently needed, it adds.

Chapter V deals with the family: its roles, rights, composition and structure. It states that, while various forms of the family exist in different social, cultural, legal and political systems, the family is the basic unit of society and is

entitled to receive comprehensive protection and support. Traditional notions of gender-based division of parental functions do not reflect current realities, as more and more women worldwide are working outside the home. Actions recommended include effective action by Governments to eliminate all forms of coercion and discrimination in policies and practices on matters related to family structure and composition.

In addition, Governments should provide and promote means to facilitate compatibility between working and parental responsibilities, especially for single-parent households. Governments should be able to monitor the impact of their decisions and actions on families, including families' ability to meet the basic needs of their members. Efforts should be made to build family-like ties in especially difficult circumstances, such as those involving street children.

Addressing population growth and structures in Chapter VI, the Programme says that in order to facilitate the demographic transition in countries where there is an imbalance between demographic rates and social, economic and environmental goals, the interrelationships between fertility and mortality levels should be recognized. It stresses the need to ensure that every child is a wanted child.

Countries must enact and strictly enforce laws against economic exploitation, physical and mental abuse or neglect of children. Noting that the "ageing of populations" is both an opportunity and a challenge to all societies, it calls on Governments to seek to enhance the self-reliance of elderly people to facilitate their continued participation in society. It also calls on Governments to respect the cultures of indigenous people and enable them to have tenure and manage their lands.

Chapter VII concerns reproductive rights and reproductive health. It sets the tone for a new approach to family planning in the context of reproductive health care, including sexual health. It defines "reproductive health" as a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity, in all matters relating to the reproductive system and to its functions and processes. Implicit in that definition, therefore, is the need for people to have a satisfying and safe sex life and to have the capability of reproducing and the freedom to decide if, when and how often to do so.

It goes on to state that "implicit in this last condition are the right of men and women to be informed and to have access to safe, effective, affordable and acceptable methods of family planning of their choice, as well as other methods of their choice for regulation of fertility which are not against the law, and the right of access to appropriate health-care services that will enable women to go safely through pregnancy and child-birth and provide couples with the best chance of having a healthy infant". "Reproductive health care" is defined as the constellation of methods, techniques and services that contribute to reproductive health and well-being through preventing and solving reproductive health problems. It also includes sexual health, the purpose of which is the enhancement of life and personal relations, and not merely counselling and care relating to reproduction and sexually transmitted diseases.

The chapter goes on to state that "reproductive rights" is a concept that embraces certain already recognized human rights. "These rights rest on the recognition of the basic right of all couples and individuals to decide freely and responsibly the number, spacing and timing of their children and to have the information and means to do so, and the right to attain the highest standard of sexual and reproductive health. It also includes the right of all to make decisions concerning reproduction free of discrimination, coercion and violence as expressed in human rights documents".

Among actions called for are efforts by countries to make accessible, through the primary health-care system, reproductive health to all individuals of appropriate ages as soon as possible, and no later than the year 2015. The international community should give consideration to the training, technical assistance, short-term contraceptive supply needs and the needs of the countries in transition from centrally managed to market economies, where reproductive and sexual health is poor. At the same time, those countries must urgently address their current reliance on abortion for fertility regulation by meeting the needs of women for better information and more choices.

The principle of informed free choice is essential to the long-term success of programmes on family planning, the Programme says. Coercion of any kind is inadmissible. All countries should take steps to meet the family-planning needs of their populations as soon as possible and should, by the year 2015, seek to provide universal access to a full range of safe and reliable family-planning methods and to related reproductive health services which are not against the law. The aim should be to assist couples and individuals to achieve their reproductive goals and give them the full opportunity to exercise the right to have children by choice.

Governments should "take appropriate steps to help women avoid abortion, which, in no case, should be promoted as a method of family planning and, in all cases, provide for the humane treatment and counselling of women who have had recourse to abortion".

Regarding sexually transmitted diseases and HIV prevention, the Programme states that the social and economic disadvantages that women face make them especially vulnerable to those diseases. The promotion and the reliable supply and distribution of high- quality condoms should become integral components of reproductive health-care services. Addressing human sexuality and gender relations, the chapter states that support should be given to sexual education and services for young people, with the support and guidance of their parents. The responsibility of males for their own sexual health and fertility should be stressed. Governments should base national policies on a better understanding of the need for responsible human sexuality and the realities of current sexual behaviour.

Adolescents should have access to information and services that help them to understand their sexuality. That should be combined with the education of young men to respect women's self- determination and to share responsibility with women in matters of sexuality and reproduction. Countries are called upon to ensure that the programmes and attitudes of health-care providers do not restrict the access of adolescents to appropriate services and the information they need, including information on sexually transmitted diseases and sexual abuse. Services for them must safeguard their rights to privacy, confidentiality, respect and informed consent, respecting cultural values and religious beliefs.

Chapter VIII concerns health, morbidity and mortality. Countries are called upon to make access to basic health care and health promotion the central strategies for reducing mortality and morbidity. They should seek to make primary health care, including reproductive health care, universally available by the end of the current decade. The role of women as primary custodians of family health should be recognized and supported. Governments should seek to make basic health-care services more sustainable financially, while ensuring equitable access. That could be ensured by integrating sexual and reproductive health services, including maternal and child-health and family-planning services, and by making appropriate use of community-based services, social marketing and cost-recovery schemes, with a view to increasing the range and quality of services available.

The mortality of children under five years of age exhibits significant variations between and within regions and countries, it says. Child survival is closely linked to the timing, spacing and number of births, and to the reproductive health of mothers. Where infant mortality remains high, couples often have more children than they otherwise would to ensure that a desired number survive.

For infants and children to receive the best nutrition and for specific protection against a range of diseases, breast-feeding should be protected, promoted and supported. Safe motherhood has been accepted in many countries as a strategy to reduce maternal morbidity and mortality. In a footnote, the expression "safe motherhood" is explained as follows: it aims at attaining optimum maternal and newborn health; implies reduction of maternal mortality and morbidity and enhancement of the health of newborn infants through equitable access to primary health care. Currently, the chapter states, approximately 90 per cent of the countries of the world, representing 96 per cent of the world population, have policies that permit abortion, under varying legal conditions, to save the life of a woman. However, a significant proportion of the abortions carried out are self-induced or otherwise unsafe, leading to a large number of maternal deaths or to permanent injury to the women involved.

Calling on countries to reduce maternal morbidity and mortality to levels where they no longer constitute a public health problem, the Programme of Action states that in no case should abortion be promoted as a method of family planning. Governments are urged to deal with the health impact of unsafe abortion as a major public health concern, and to reduce the recourse to abortion through expanded and improved family-planning services. Prevention of unwanted pregnancies must always be given the highest priority, and all attempts should be made to eliminate the need for abortion. In circumstances in which abortion is not against the law, such abortion should be safe. A footnote in the text contains the definition by the World Health Organization (WHO) of unsafe abortion, according to which it is a procedure for terminating an unwanted pregnancy, either by persons lacking necessary skills, or in an environment lacking the minimal medical standards, or both.

To deal with HIV/AIDS, Chapter VIII calls for multisectoral plans and strategies to be integrated into population and development strategies. Donor and research communities should support and strengthen current efforts to find a vaccine and to develop women-controlled methods, such as vaginal microbicide, to prevent HIV infection. Governments should develop policies and guidelines to protect the individual rights of persons infected with HIV. Responsible sexual behaviour, including sexual abstinence, for the prevention of HIV infection should be promoted and included in education and information programmes.

Chapter IX concerns population distribution, urbanization and internal migration. In order to reduce urban bias and isolated rural development, Governments should examine the feasibility of providing incentives to encourage the redistribution and relocation of industries and businesses from urban to rural areas, as well as the establishment of income-generating projects in the rural areas.

Countries are urged to recognize that the lands of indigenous people and their communities should be protected from activities that are environmentally unsound or that are considered by them to be socially and culturally inappropriate.

The terms "lands", it adds, is understood to include the environment of the areas which the people concerned traditionally occupy. In order to improve the plight of the urban poor, many of whom work in the informal sector, Governments should promote the integration of migrants from rural into urban areas and the improvement of their income-earning capability, by facilitating their access to employment, credit, basic education, health services and transportation.

The objectives of the measures proposed regarding internally displaced persons are to offer adequate protection and assistance to persons displaced within their own country, particularly women, children and the elderly, and to put an end to all forms of forced migration, including "ethnic cleansing". Measures should be taken at the national level with international cooperation to find lasting solutions to questions relating to internally displaced persons, including their right to voluntary and safe return to their home of origin.

Chapter X, on international migration, proposes measures aimed at addressing the root causes of migration, especially those relating to poverty; to encourage more cooperation and dialogue between countries of origin and countries of destination, in order to increase the likelihood that migration has positive consequences for the development of both sending and receiving countries; and to facilitate the reintegration process of returning migrants. Regarding documented migrants, among the actions proposed are recognition by Governments of receiving countries of the vital importance of family reunification and its integration into national legislation, in order to ensure the protection of the unity of the families of documented migrants. Governments of receiving countries must also ensure the protection of migrants and their families.

Proposals for action concerning refugees, asylum seekers and displaced persons include a call to Governments to address the root causes of those movements by taking appropriate measures, particularly with respect to conflict resolution; the promotion of peace and reconciliation; respect for human rights, including those of persons belonging to minorities; respect for independence, territorial integrity and sovereignty of States.

Chapter XI concerns population, development and education. It stresses that education is a key factor in sustainable development as it is a component of well-being; and a factor in the development of well-being, through its links with demographic as well as economic and social factors. It is essential to promote a harmonious development of educational systems and economic and social systems conducive to sustainable development. The chapter states that more education is needed in all societies on the implications of population-environment relationships, in order to influence behavioural change and consumer life-styles and to promote sustainable management of natural resources. The media should be a major instrument for expanding knowledge and motivation.

The chapter on technology research and development, Chapter XII, calls for strengthening national capacity to carry out sustained and comprehensive programmes of collection, analysis, dissemination and utilization of population and development programmes. All data collection and analysis activities should give due consideration to gender-disaggregation and enhancing knowledge on the position and role of gender in social and demographic processes.

Also called for is increased support for basic and applied science research to strengthen reproductive health services, including the improvement of fertility regulation methods that are acceptable, easy to use and safe. Since unsafe abortion is a major threat to the health and lives of women, research to understand and better address the determinants and consequences of induced abortion, including its effects on subsequent fertility, reproductive and mental health and contraceptive practice, should be promoted, as well as research on the treatment of complications of abortion and post-abortion. Also called for is high priority to be given to the development of fertility regulation methods for men.

Chapter XIII, on national policies and plans of action, calls on countries to formulate and implement human resources development programmes in a manner that explicitly addresses the needs of population and development strategies, policies, plans and programmes. The chapter calls for giving special consideration to the basic education, training and employment of women at all levels, especially at decision-making and managerial levels, and to the incorporation of user and gender perspectives throughout the training programmes.

It contains estimates of the implementation of the Programme of Action in the developing countries and countries with economies in transition in the period 2000-2015 in the following areas: family-planning services; reproductive health services; prevention of sexually transmitted diseases, including HIV/AIDS; and population data collection, analysis and dissemination, policy formulation and research. The implementation of programmes in those three areas will cost US\$17 billion in 2000, \$18.5 billion in 2005, \$20.5 billion in 2010 and \$21.7 billion in 2015. It estimates tentatively that up to two-thirds of the costs will continue to be met by the countries themselves and in the order of one-third from external sources. Domestic resource mobilization is one of the highest priority areas for focused attention to ensure the timely action to meet the objectives of the Conference's Programme of Action.

In Chapter XIV, on international cooperation, the Programme urges the international community to adopt favourable macro-economic policies for promoting sustained economic growth and sustainable development in developing

countries. Given the magnitude of the financial resource needs for national population and development programmes, the need for complementary resource flows from donor countries would be in the order of US\$5.7 billion in 2000; \$6.1 billion in 2005; \$6.8 billion in 2010; and \$7.2 billion in 2015.

Chapter XV concerns partnership with the non-governmental sector. It calls on non-governmental organizations to strengthen their interaction with their constituencies, ensure the transparency of their activities, mobilize public opinion, participate in the implementation of population and development programmes and actively contribute to the national, regional and international debate on population and development issues.

Regarding the private sector, it states that the profit- oriented sector plays an important role in social and economic development, including production and delivery of sexual and reproductive health commodities and services. Private sector involvement may assist or supplement but must not mitigate the responsibility of Governments to provide full, safe and accessible reproductive health services to all people.

Chapter XVI, on follow-up to the Conference, addressing national level activities, calls on all countries to assess regularly their progress towards achieving the objectives and goals of the Programme of Action, on a periodic basis. In the preparation of those assessments and reports, Governments should outline successes achieved, as well as problems and obstacles encountered. Where possible, such national reports should be compatible with the national sustainable development plans that countries will prepare in the context of the implementation of "Agenda 21" -- the programme of action of the "Earth Summit". The General Assembly should organize a regular review of the implementation of the Cairo Programme of Action.

The General Assembly and the Economic and Social Council should review the roles, responsibilities, mandates and comparative advantages of both the intergovernmental bodies and the organs of the United Nations system addressing population and development, with a view to ensuring clear recognition of the interrelationships among policy guidance, research, standard setting and operational activities for population and development, as well as the division of labour between the bodies concerned. As part of that review, the Council should consider the respective roles of the relevant United Nations organs dealing with population and development, including UNFPA and the Population Division, regarding the follow-up of the Programme of Action. The Assembly is invited to consider establishing a separate executive board for UNFPA.

Following the adoption of the Programme of Action, Dr. Nafis Sadik, in her capacity as Secretary-General of ICPD, stated that the Conference has been an outstanding success. It was attended by 180 countries and addressed by 249 speakers. Altogether, 10,757 people took part, which does not include the additional participation of non-governmental organizations. Mentioning that controversies had served to clarify the main issues and had been discussed to the point of exhaustion, she stated: "You have crafted a Programme of Action for the next 20 years which starts from the reality of the world we live in, and shows us the path to a better reality. . . . it has the potential to change the world".

Without resources, however, the Programme will remain a paper promise, she said. "We need a commitment from all countries -- both developed and developing countries -- that they will take their full responsibility in this regard". Compared with any earlier document on population and development, this Programme is "detailed in its analysis; specific in its objectives; precise in its recommendations; and transparent in its methodology. It represents a quantum leap to a higher state of energy. I remain committed to building the future by building the power to choose".