

NEW DEVELOPMENTS IN HORMONAL INJECTABLE AND IMPLANT CONTRACEPTIVES FOR WOMEN: PROGRAMME INTRODUCTION GUIDELINES

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ABSTRACT

Stabilization of uncontrolled population growth is an important national goal. Family welfare programme needs a variety of reversible spacing methods. Although in recent years contraceptive prevalence rate in India has increased considerably mainly due to sterilization, for better demographic outcome spacing of child births is very important. In this regard long-acting hormonal contraceptives (injectables and implants), which provide very effective and reversible protection, can play an important role. Many women prefer such methods and these are being used successfully in family planning programmes of many countries.

In this Paper, the currently available injectable contraceptives which are used at 1, 2, or 3 months intervals, and implant contraceptives that are used at 3 to 5 years intervals are described. The major side effect with their use is menstrual disturbances, which may have a deterrent effect on their continued use. However, with proper counseling before and during use, many women continue to use these. Before introducing these long-acting hormonal contraceptives in a mass programme, adequate planning and preparation, and conducting field trials along the line of operations research would be most vital for developing programme operations guidelines.

Key Words: Injectables and implants, Stabilization, Menstrual disturbances, Field trials

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Uncontrolled growth of population is the most urgent problem in the country and population stabilization programme has the top priority. At present, India's population is about 1.26 billion, and there are nearly 200 million couples in the reproductive age group. According to a current estimates about 56 per cent of the eligible couples are being protected by the contraceptive practice. Out of these, about 36 per cent have accepted sterilization, and remaining use other methods including conventional contraceptives, intra-uterine devices (IUDs) and oral pills. It may be pointed out that the majority of the acceptors of sterilization have already three or more children. The expert groups have stated that for achieving a Net Reproduction Rate of one, more than 60 per cent of the eligible couples have to be effectively covered. This itself is a great task. Furthermore, for better demographic impact larger proportion of couples should accept and practice spacing methods. It has been noted that the infant mortality rates are two and a half times higher among the babies born within an interval of less than two years compared to those born after a gap of four years. Reduction in infant mortality through spacing will further promote family planning acceptance. A large number of reliable spacing methods are available and are being used extensively in different parts of the world. In Japan about 80 per cent of family planning acceptors have used condoms, whereas more than 50 per cent of the acceptors in China used IUD. Hormonal contraceptives also hold good promise as a spacing method.

More than 50 million women in the world are presently using oral pills. For various reasons oral pills have not become popular in our country. One of the main reasons is the inconvenience of daily intake of pills, for which strong and sustained motivation is needed. In this regard, the long-acting hormonal contraceptives such as injectables and implants have many advantages. Injections of a long-acting hormonal contraceptives at intervals of 1, 2 or 3 months and hormonal implants at intervals of 3 to 5 years provide highly effective protection. Many women prefer such methods and these are being used successfully in the Family Planning Programmes of many countries.

The overall approach for contraception should be to make best possible use of the currently available methods, to improve upon the existing ones, and to develop and/or introduce speedily new and better methods. There is a great need and scope for promotion of acceptance of all spacing methods. This presentation, however, will be restricted primarily to injectables and implants. Nevertheless, the basic principles enumerated and the approaches suggested in this paper would also be applicable to other contraceptives to be used in a mass programme.

INJECTABLE CONTRACEPTIVES

Developmental History

Research on injectable contraceptives began shortly after the development of oral contraceptives. In 1957, the first injectable contraceptive (NETEN or Noristerat) was developed by Schering AG (Germany). Upjohn Company in USA first developed depo-medroxy progesterone acetate (DMPA/Depo-Provera). In 1960, first clinical trials were conducted in Bahia (Brazil) in women presenting with premature labour or spontaneous abortion. Although there was some evidence of a reduction in uterine activity following Depo-Provera injection, premature labour was not stopped in a single case. About 6-8 months later some of these women returned to the clinic and complained of infertility which continued for longer periods; after 3 years all these women conceived without any treatment. This information that use of Depo-Provera produced reversible infertility was promptly passed on to Upjohn Company. Following this the first clinical trial with DMPA as an injectable contraceptive was conducted in 1963.

Researchers developed the first monthly injectables and conducted clinical trials in 1960s. The first combined injectable containing a progestin plus estrogen (Cyclofem) was first tested in 1968, and the second combined injectable (Mesigyna) was first tested in 1974.

DMPA has always been the most widely used injectable, but the long wait for approval in the US had made it controversial. In early 1970s, the tests of DMPA in Beagle dogs and monkeys reported development of breast cancer in dogs and endometrial cancer in some monkeys. These reports were the basis of reservations by FDA of US. However, WHO collaborative study examined the risk of cancer among users of hormonal contraceptives, and came to the conclusion in 1991 that there was no overall risk of cancer of breast, cervix, endometrium, ovary and liver. Following this, the US FDA changed its position and approved use of DMPA in 1992. Subsequently, further evidences on cancer issues have been reported.

Research of the World Health Organization (WHO) and approval of DMPA by US regulatory agency have marked the start of a new era for injectables. The research by WHO reduced the fear about DMPA causing cancer. Approval of

DMPA by FDA in US in 1992, made injectable available in US and allowed USAID to provide DMPA to Family Planning Programmes in developing countries.

Use of Injectables

Except in a handful of countries, few women used injectable contraceptives compared to other methods. However; information from donor agencies suggests that their use is increasing. As of 1996, about 12 million women in developing countries have been using injectable contraceptives.

Knowledge of injectables is not as widespread as knowledge of some other methods. Women who know about injectables often do not know where-from to obtain these. However, a few countries offer a contrast. In the countries with greatest use of injectables- Indonesia with 15 per cent of married women of reproductive age and Thailand with 12 per cent users, injectables have been widely available for more than 20 years. Injectables are well liked in these countries, where women value the convenience of injectables and are not discouraged by irregular menstrual bleeding or amenorrhoea.

Surveys in other developed countries do not mention injectables or else include them among other methods.

Effectiveness and Reversibility

Injectable contraceptives combine almost complete effectiveness with reliable reversibility. Most clinical trials report less than one pregnancy per 100 women in the first year of use. Thus injectables are comparable in effectiveness to Norplant implants, TCu- IUDs and voluntary sterilization. Injectables work mainly by preventing ovulation by suppressing LH surge from the pituitary gland. These also thicken the cervical mucus, making it a barrier to sperm transport, thus blocking fertilization. DMPA has been tested in a variety of doses and injection schedules. However, the 150 mg dose every three months is the most widely used regimen. NETEN 200 mg dose has also been tested in different schedules; but the IPPF and WHO recommend the 2-month schedule. Monthly injectables, Cycloferm and Mesigyna are also effective.

The effectiveness of injectables depends on the timing of the first injection, adherence to the injection schedule and the injection technique. The first injection is usually given during the first seven days of menstrual cycle. If the

injections are started after day 7 of a regular cycle, a back-up method upto one week may be recommended.

For follow-up visits the users can come a little late for the next injection without risking pregnancy. DMPA users can come at least two weeks late; NETEN users at least one week late; and the users of monthly injectables upto three days late. If the users come any later, the providers must ensure that they are not pregnant before giving the next injection. Clients may also return earlier than scheduled.

Injection Technique is Important

Careful injection technique ensures that full dose is absorbed at the right rate and this is fully effective.

- With DMPA, providers need to shake vials mildly to dissolve any sediment at the bottom; shaking should not be vigorous.
- NETEN vials need to be warmed up to body temperature; viscous solution becomes thin and makes it easier to draw into syringe.
- All injection should be given into the muscle; and not into fat, which slows absorption. Injection sites should also not be massaged, as it accelerates absorption.

Return of Fertility

Most of former users of injectables can expect to become pregnant within a year after their last injection, if they do not use another contraceptive. The largest study on return of fertility among users of DMPA conducted in Thailand, found that women conceived on average nine months after last injection. Other studies also reported similar findings. In an Indian study, it was found that 69 former users of NETEN conceived within 11 months after the last injection. By comparison, 110 former IUD users conceived on an average about 3-5 months after discontinuation. In case of monthly injectables users, ovulation returned 3-4 months after the last injection.

Delay in return of fertility is partly because injectables remain in the blood stream for several months after the next due date of injection. DMPA, for example, is detectable in the blood stream for 8 months on an average after one injection. Amenorrhoea may persist for several months after the women discontinue

injectables. Providers should warn women about this, and reassure them that their regular cycles will return eventually. Further, there is no evidence that injectables cause infertility.

The User's Perspectives on Injectables

Many women throughout the world value injectables because these are highly effective, long-acting, reversible and convenient; these can be used privately. Further, breast-feeding women who want to use hormonal contraceptive can use progestin only contraceptive (DMPA or NETEN).

Women experience a variety of side-effects with injectables. Menstrual disturbance is common and some women find it troublesome. Counseling helps women in understanding that the frequent or irregular bleeding is not dangerous, and many continue to use injectable despite bleeding changes. The combined injectables like Cyclofem and Mesigyna cause less menstrual disruption. Some women may report weight gain, headache and dizziness.

Counseling Issues:

- Range of side-effects, which are usually mild
- Bleeding changes and their relevance
- Any risk of breast cancer
- Delay in return of fertility
- Returning late or early for repeat injections

Maximizing Access and Quality

Programme Introduction of Contraceptives: Before considering introduction of any new method of contraceptives in a mass programme, various factors and issues, which affect contraceptive acceptance, practice and continuation rate need to be considered seriously. Experience gained from clinic-based trials is not adequate from the point of programme operations. Many other factors which do not exist in well-controlled clinical trial situation become crucial for success in a mass programme. Without careful planning and preparation, the new methods may be poorly accepted, and the dropout and pregnancy rates may be unacceptably high. This in turn may also damage the reputation of the family planning programme. After proper planning and preparation, the method may be

introduced in a limited scale at first, and on the basis of the experience gained it may be introduced into other areas in an incremental fashion.

Lessons Learned About Injectables

For maximizing access and quality of services for injectable contraceptives would require a well planned introduction of the method through training, balanced and extensive communication with the community, application of scientific medical guidelines for provision and use, and informative and sensitive counseling.

Lessons for Policy Makers

- Registration of injectable contraceptives (ICs) if not already done.
- Ensure ICs are offered in Family Planning Programmes.
- Avoid restrictions to use of ICs based on age and parity; there are no medical reasons for these.
- Women who have epilepsy, tuberculosis, varicose veins or deep vein thrombosis may be allowed to use DMPA or NETEN injectables.

Lessons for Programme Managers

- When introducing or expanding ICs services, conduct seminars for orientation of policy makers and service providers.
- For identifying the views, concerns and misperceptions about ICs, audience research may be conducted. Such information will be helpful in designing IEC programmes and in training of service providers.
- Pilot studies may be conducted to assess clients' responses to ICs.
- Accurate information is to be provided to the service providers, clients and the public.
- Providers have to be trained in counseling and infection prevention; periodic refresher training would be important. In case of new introduction of ICs, training has to be extensive.
- For women having heavy or prolonged bleeding access to treatment and counseling should be ensured.

- It is recommended that only one type of progestin- only injectables is offered in the programme; and if there is demand, one monthly progestin-estrogen injectable may be offered. Offering more injectables increases choice, but may strain the logistics systems.
- For ensuring reliable supply of injectables, order may be placed 6-12 months in advance; time may be taken for making accurate forecast of demands.
- Shorten the travel time for injectables and other contraceptives from manufacturer to clinic.
- Allow flexibility in the injection schedule. Whenever, the provider is reasonably sure that the woman is not pregnant, she may receive her first injection.
- Disposable needles and syringes packed with injectables may be ordered. Ensure that these needles and syringes are not reused.

Lesson for Providers

- They should learn about injectables in detail. Well informed providers can give clients balanced information and avoid biases for or against injectables.
- They should take time to properly counsel the clients. Women who had been counseled about side-effects of injectables, particularly changes in menstrual bleeding, tend to be more satisfied with the method and use it longer than women who have not been counseled.
- They are to take steps to prevent infection by using a new disposable needle and syringe for each injection and disposing these off carefully. If reusable needles and syringes must be used, these should be properly sterilized or disinfected (high level) before use.
- Since the injectables do not protect against STDs including HIV/AIDS, women who chose injectables and are at risk for STDs should be advised to use condom in addition.

IMPLANT CONTRACEPTIVES

Developmental History

Implant contraceptives were developed almost exclusively through an effort of Population Council's Biomedical Division and the International Committee

for Contraception Research. The rationale for its development as a contraceptive was based on animal studies conducted by S. Segal and H. Croxatto. Implants have been used in several thousand women over a period of 12-15 years, and a dozen of different compounds have been tested for release rates and duration of effect. At that time two main types of implant contraceptives were offered: a) Norgestrel implants whose 6 capsules inserted simultaneously provided contraception for 5-7 years; b) Norgestrienone implants whose 6 capsules inserted simultaneously provided contraceptive protection for 18 months with a more acceptable bleeding pattern than Norgestrel. The major side-effects of implant contraception remain the same as those reported by users of Depo-Provera injectables related to disturbances in menstrual bleeding pattern. Depo-Provera injectable has the advantage over implants in the ease of administration. The main disadvantage is the need to repeat injections at 2-3 months intervals. Implants are more convenient needing replacement only after 3-5 years; and prompt return of fertility at any time after implant removal is another advantage over long-acting injectables.

The new contraceptive implants that are becoming available to family planning programmes around the world are:

1. One-rod system-**Implanon**
2. Two-rod system-**Jadelle**
3. Two-rod system-**Sino-Implant** (Chinese)

Comparative Information on Available Contraceptive Implants

1. Implanon (Organon)

It is one-rod device containing 68 mg etonogestrel; after insertion it remains effective upto 3 years. Average time needed for insertion is 1.5 minutes and for removal 2.7 minutes. It has been registered in more than 40 countries.

2. Norplant (Bayer- Schering Pharma)

It is six capsule devices, each containing 36 mg levonorgestrel; it was introduced in mid-eighties. After insertion it is labeled to remain effective upto 5 years; but larger studies have reported its effectiveness for 7 years. Average time needed for insertion is 4.8 minutes and for removal 10-15 minutes. It has been

registered in more than 60 countries. However, it will not be available after 2008; it is being withdrawn.

3. Jadelle (Bayer-Schering Pharma)

It is a 2 rods device, each containing 75 mg levonorgestrel. After insertion it remains effective upto 5 years.

Average time needed for insertion is 2.5 minutes and for removal 5 to 7.5 minutes. It has been registered in more than 50 countries.

4. Sino- Implant (Shanghai –Dekua Pharma)

It is a 2 rods device, each containing 75 mg levonorgestrel. After insertion it remains effective upto 4 years. It has been registered in China and Indonesia. It may cost much less than the other two new implants.

Nature and Mode of Actions of New Implants

The new contraceptive implants are small, thin, flexible plastic rods each about the size of a match stick, that releases progestin hormone, either levonorgestrel or etonogestrel, in the body. This hormone prevents pregnancy by acting at different levels: (a) by thickening cervical mucus it prevents sperm penetration and transport blocking its reaction with egg, (b) preventing ovulation, and (c) disturbing menstrual cycle makes endometrium unsuitable for implantation. With Implanon, primary mode of action is blocking of ovulation in most of the cycles, and with Jadelle ovulation is prevented in about half of cycles. Implants do not interrupt an existing pregnancy.

Effectiveness of Implant Contraceptives

It is more than 99 per cent effective; that means less than one woman in 100 may become pregnant during one year of use of implant contraceptives. Continuation rates are also high. Some recent Cochrane Review have found that majority of women are using their implants on long-term; more than 80 per cent women were using at the end of two years. In other clinical trials and observational studies in a number of countries, continuation rates for implants range between 78 per cent and 96 per cent at one year and between 56 per cent and 86 per cent at three years.

Advantages of Using Implant Contraceptive

- The user does not have to remember taking pill every day; she has to remember about contraception every 3 to 5 years depending on the type of implant being used.
- It does not interfere with sex.
- It can be used during breast-feeding.
- Any pain during menstruation will be less.
- It can be used by some women who cannot take estrogen containing pill.
- It may provide protection against pelvic infection through its action on cervical mucus.

Disadvantages of Using Implant Contraceptives

The release of progestogen usually causes changes in the endometrial-bleeding pattern. During the first year it is common to have irregular bleeding. Sometimes periods are heavier and prolonged. Usually after the first year, these may settle back to somewhat regular pattern. In some women, periods become infrequent and light or even stop altogether. So women get worried with changed pattern of periods; but it is of no consequence. However, unpredictable or irregular periods can be a nuisance.

Other Side-Effects

As with all hormonal contraceptives, some women may report mood changes, breast discomfort, weight gain, fluid retention, headaches and increase in acne. However these are uncommon, and if these do appear they tend to develop in the first few months only; these often disappear after 3-6 months. There is a slight risk of infection at the site of cut made for insertion of implant.

There may be changes in cholesterol metabolism and depletion in bone minerals. However cancer fear is unfounded.

Non-contraceptive Health Benefits

- Reduced anaemia
- Fewer sickle cell crisis
- Other potential benefits

How Is the Implant Put Under Skin?

- Usually, it is first inserted within 5 days of onset of menses, which ensures absence of pregnancy; it is effective from then onwards.
- It is to be placed in the inner side of upper arm. An injection of local anaesthesia is given in the area. Then a small cut is made in the skin and the implant is placed under the skin. The wound is dressed; this will heal soon just like any other small cut.
- The area around the implant may be bruised and sore for few days, but this goes soon.

When and How the Implant is Taken Out?

- If a women wishes to continue with this type of contraception, a replacement would be needed every 3-5 years depending on the type of implant being used. It requires a small operation under local anaesthetic to remove it and to put a new one.
- The implant can be taken out at any time, if requested. It loses effect immediately after removal. So if required another form of contraception needs to be started seven days prior to removal of implant.

Reversibility

After the implant is removed, there is prompt return of fertility.

Programmes Should Consider Offering New Implants

The WHO model list of essential medicines, as published in March 2007, includes two-rod levonorgestrel releasing implant. This is likely to create greater awareness of implants at country levels.

PROBLEMS OF ALTERED ENDOMETRIAL BLEEDING INDUCED BY INJECTABLE AND IMPLANT CONTRACEPTIVES

Since this is a very important event that may seriously affect the use or continued use of these methods by women, a detailed consideration of this phenomenon would be desirable under the following headings:

- A. How the endometrial bleeding is caused by the use of progestins; and
- B. How women perceive menstruation and its altered pattern?

How Does Progestogen Cause Endometrial Bleeding?

Progestogen-induced endometrial bleeding is known as breakthrough bleeding. It is not menstruation; it in fact differs from normal menstruation in several ways.

In a normal cycle, menstruation occurs when the endometrium in its secretory phase is subjected to falling levels of ovarian steroids; as a result support for endometrial growth and sustenance is withdrawn. Most of menstrual blood loss occur through the spiral arterioles, together with the collapse and shedding of most of functionalis layer. Progestogen induced breakthrough bleeding occurs from smaller capillaries and veins. This bleeding starts and stops irregularly and unpredictably; the endometrium shows none of the cyclic changes of the normal endometrium.

Different women respond differently to the use of progestogen-only contraceptive methods. Bleeding patterns may also vary according to the type and dose of progestogen used. With the use of Norplant capsule containing levonorgestrel, irregular and prolonged breakthrough bleeding is usually at its worst during the first 12 months of use, becoming more regular thereafter. With the use of DMPA injections also, the women start with prolonged and irregular bleeding, but later on this pattern is replaced by increasing periods of amenorrhoea. What is the real cause is not clear?

In women using Norplant, endometrial thickness is greatly reduced (2-20per cent of thickness of mid-secretory phase). But in contrast to reduced volume of endometrium, there is often an increase in vascular density with reduced arteriole development and appearance of large thin walled venules. Other typical endometrial changes induced by progestogen-only contraceptives include: a) increased progesterone receptors, b) reduced estrogen receptors, c) elevated levels of vascular endothelial growth factor (VEGF), d) reduced endothelin, and e) increased levels of angiotensinogen.

Hysteroscopy has revealed normal looking capillaries by the side of highly congested vessels and large thin walled vascular spaces. There may be patchy rupture of vessels with intra-endometrial hemorrhage. There is evidence of

increased fragility of blood vessels, which probably results from disturbance of angiogenesis (the process of development of blood vessels). In addition, tissue repair may be impaired, including clotting mechanism that would normally restrict bleeding.

What makes the problem of breakthrough bleeding so mysterious is that women's reactions to progestogen-only contraceptives vary from almost continuous bleeding to no bleeding whatsoever during the first year of Norplant use. A wide range of treatment have been tried to overcome the disturbances in the bleeding patterns of women using progestin-only methods. During 1980s and 1990s a variety of treatment regimens have been tried. These included estrogens, combined (E+P) contraceptives, non-steroidal anti-inflammatory agents, vitamins, iron and anxiolytics. There are reports that use of combined oral contraceptives may help to regularize the bleeding in Norplant users; but the women may doubt the advantage of using two contraceptive methods at the same time. There is no clear consensus on the best treatment for progestogen-induced breakthrough bleeding. However, experience shows the benefit and importance of good counseling. If a woman is informed of the side-effects and she understands them before she starts to use a progestogen-only contraceptive, this will increase her acceptance of subsequent breakthrough bleedings.

How Women Perceive Menstruation and Their Menstrual Patterns?

Women all over the world are very aware of their pattern of menstruation and how it affects their lives. In a 10-country study, more than 66 per cent women said they preferred one monthly bleed. Most women (ranging from 53 % in UK to 91% in India) didn't wish to use methods that induced amenorrhoea.

Perceptions of menstruation vary in different cultures; this may be positive or negative. How acceptable hormonal contraceptives are, often depends on how much change in menstrual bleeding a women experiences and what her perception of menstruation is.

Positive feelings are: It is a sign of femininity, fertility, youth, or purification of body. On the other hand, it may be linked with vulnerability and pollution, and with attitudes of disgust and shame. In some societies, these negative perceptions are the basis for restricting women's religious, social and domestic activities, while they are menstruating. A woman has two perceptions of bleeding one from her actual experience and the other from her position as a member of the society,

which has attached certain meanings to menstruation. The interaction of these two elements determine her attitude to menstrual bleeding.

In 1999, Progress No. 52 had reviewed various studies carried out in different parts of the world on women's perceptions and preferences regarding patterns of vaginal bleeding associated with different regimens of hormonal contraception. The responses were very varied. In majority of cases they preferred less frequent bleeding, withdrawal bleeding every three months; some preferred monthly bleeding; a small percentage preferred not to bleed at all. In a large European study, 1201 women from France, Germany and UK were interviewed (Fuchs et al. 1996). The most preferred pattern of bleeding was every three months, and least preference was no bleeding at all.

Few studies have been carried out on women using injection or implant contraceptives. In one study in three different clinics in USA (Gold and Coupey 1998), 74 per cent of young women said that they would stop using a contraceptive method if it caused irregular bleeding and 66 per cent said they would stop if it caused amenorrhea. It may be pertinent to mention that in one study in Thailand (Supanee, 1998), amenorrhoea was viewed in negative light; it is unhealthy and has adverse effect on women's appearance.

Keeping in view of such perception, a group of researchers in Thailand offered DMPA users complaining of amenorrhoea the option to switch to combined monthly injectable, 'Cyclofem' in order to enable them to menstruate. Cyclofem contains 25 mg DMPA plus 5 mg estradiol cypionate. A controlled trial was conducted on 100 DMPA induced amenorrhoeic women, and there were quite encouraging responses. About 82 per cent of Cyclofem users experienced some vaginal bleeding within six months, but almost all of them reported hormonal side-effects. In spite of these, one-third of women chose to continue using Cyclofem at the end of the trial, despite the fact that it required a more demanding schedule of administration.

In a controlled study in China (Lei et al. 1996), the importance of counseling on menstrual changes associated with injectable contraceptive was clearly demonstrated. Of 421 users of DMPA, half were given detailed counseling both before and during treatment, while half received only routine counseling. In both groups, women who stopped using DMPA cited menstrual change as the main reason for discontinuation. However, one year later 42 per cent of women who received intense counseling were still using DMPA compared to only 11 per cent of women who received routine counseling were continuing.

It is clearly evident from the above that many women world-wide see their pattern of menstruation as sign both of their reproductive as well as general health. The natural process of menstruation has taken on such socio-cultural, religious and psychological significance that many women refuse to tolerate disturbances in the pattern of their vaginal bleeding as a result of using hormonal contraceptives. There is a need for in-depth study of the whole phenomenon.

FACTORS INFLUENCING ACCEPTANCE AND CONTINUED USE OF CONTRACEPTIVES

The acceptability of any contraceptive in a community can be judged by its continued use. This is influenced by various factors such as (1) the intrinsic character of the method, (2) individual and social acceptability, (3) providers knowledge, skill, attitude and credibility, (4) effective communication, (5) appropriate delivery system, and (6) cost.

Intrinsic Character of the Method

The intrinsic characters of a particular method, which affect the acceptance and continuation rate etc are (a) medical safety, (b) effectiveness, (c) side-effects, (d) ease in continuity of use, and (e) easy reversibility. The programme personnel and the health and family planning field staff should be well versed with these aspects for carrying out their functions properly in terms of educating, motivating, guiding, serving and counseling the prospective and current users. However, the findings from service delivery studies have revealed that the intrinsic characters of new methods by themselves do not change women's choices.

Individual and Social Acceptability

From different studies, important specifications for individual and social acceptability of contraceptive methods have been identified. These are: (a) socio-economic development status; (b) cultural values, perceptions and practices in regard to menstruation and its alterations, small family norm, contraception etc; (c) nature and type of the contraceptive need; (d) accessibility and credibility of the service giving agency; (e) past experiences; (f) whether the method is to be used by male or female partner; (g) duration of effectiveness; (h) probability and ease of reversibility; (i) to be used during coitus or not; (j) mode of administration i.e. oral,

local or surgical; (k) frequency of use; (l) safety and side-effects; (m) contraceptive effectiveness; (n) need for continued motivation; and (o) peer and spouse's approval of the method.

By establishing proper rapport with the community, a proper assessment of these aspects may be made. If necessary, a short diagnostic survey may be helpful. For example, one should find out why in some sections of the population there is low acceptance of family planning.

For promoting acceptability, the leaders in the community may be contacted and be involved in the programme. The objectives and the benefits of the programme are to be explained and their cooperation is solicited. If there are existing participatory organizations such as Village Health Committees, Mother's Clubs, Youth Clubs, NGOs, Women's Organizations etc., they may be involved. Elected representatives of the area may also be approached.

Providers' Knowledge, Skill, Attitude and Credibility

The knowledge, skill and attitude of the providers, may they be the physicians or non-medical health auxiliaries, play very important role in the acceptance and continued use of contraceptives.

The goal of the field staff would be (i) to supply necessary information for education and motivation; (ii) to assist the clients to evaluate contraceptive information and services, and to make an informed choice and decision about these; and (iii) to encourage them for continued practice. Use of appropriate visual aids helps the process of communication and proper comprehension. They should explain the advantages and disadvantages of all the methods to the prospective clients and leave the final choice of the method to the clients. If the decision of the choice of method is made by the user, and particularly by the husband and wife together, the possibility of their continuing with the method would be greater.

The health and family planning workers should develop proper communication and counseling skills. While securing effective communication in family planning, they should assure and reassure the clients. They should also be able to recognize signs of various barriers and simultaneously avoid developing barriers. Similarly, they should also be alert to detect rumours and effectively counteract these.

The health and family planning personnel should develop skill for working with the community and encouraging their interest, enthusiasm, involvement and participation. They should be able to identify and satisfy some of their perceived needs, which will help in establishing their credibility within the community.

Effective Communication and Motivation

Education and motivation of the people normally proceed through four phases: (i) *Sensitization* i.e. creating an awareness and interest; (ii) *Education* i.e. further information gathering and evaluation for decision making; (iii) *Motivation* i.e. making decision for adoption and trial or experimentation; and finally (iv) *Practice* i.e. adoption and continued use.

Mass communication through exhibitions, hoardings, posters, leaflets, newspapers, magazines, films, television programmes and radio talks etc. are very helpful for sensitizing the community and creating an awareness and interest in family planning and contraceptive methods and also for allaying any adverse public opinion. However, communication through these mass media may reach and influence the couples to a limited extent. For further strengthening this education process and ultimately motivating the couples to accept and practice family planning, face to face communication through group communication and inter-personal communication play the most crucial role. It is in these latter types of communication process where the field staffs have to perform a major role. Obviously, therefore, there is an urgent need for strengthening their communication skills.

Appropriate Contraceptive Delivery System

This should take into consideration the easy accessibility; logistics of procurement, storage and supply; technical competence of the providers; physical and monitoring facilities; and technical and administrative capability of the agency for organization and management of the contraceptive delivery programme.

Effective delivery of contraceptive services at doorsteps of the people is considered to be an important measure for promotion of small family norm. The channels through which the contraceptives are to be made available to the people in community can be considered under three main groups (i) through health services infrastructure and health functionaries; (ii) through private agencies; non-

governmental organizations including voluntary organizations and (iii) social marketing, and through commercial channels.

Cost

The cost of contraceptives sold in commercial sector is out of reach of the majority of people. This may become an important barrier to contraceptive use and self-sufficiency. Original cost and re-supply costs must be considered for new technology.

The safest, most effective and most acceptable means of fertility control will do little good, unless it can be offered to potential clients in a consistent, affordable and convenient fashion. Low cost, simple and ease of delivery by indigenous programme workers are some of the important virtues of contraceptives.

FOR DELIVERY OF INJECTABLE AND IMPLANT CONTRACEPTIVES SERVICES SPECIAL EMPHASIS NEEDS TO BE GIVEN ON THE FOLLOWING:

- I. Proper Counseling of Clients Before Injection/Insertion and During Use of These Methods
- II. Organization of Proper Logistics System for the Contraceptive Procurement and Delivery to the Clients
- III. Appropriate Training of all Concerned Staff/Personnel in Administering the Methods and in Proper Counseling

I. Counseling About Injectable/Implant Contraceptives

Counseling is a step-by-step discussion between service providers and/or other programme personnel, and the clients. Counseling helps each client choose and use the family planning method that best suits that person's needs. Good counseling involves friendly and open talk with the client to find out politely what does she want and what concerns her.

The counselor tells clients about available methods including injectables and implants, about their effectiveness, safety, ease to use, side-effects and reversibility. In case of injectables and implants, they have to be told about the nature of changes in vaginal bleeding pattern that may occur ranging from more

bleeding, irregular and unpredictable bleeding, little bleeding or none at all. She needs to be assured that these changes are not harmful; these do not mean that she is sick or pregnant, or bad blood is accumulating inside. There may be slight weight gain and some other minor problems. They should be assured that medical assistance will be provided, if needed. Advantages and disadvantages of different methods are to be explained.

Revisits for repeat injections would be after 1, 2 or 3 months depending upon the type of injection being used. In case of implants, replacement would be needed after 2 to 5 years. In case the method does not suit any particular individual, the implant can be removed at any time. As regards return of fertility, it takes 8-9 months after last injection of injectable contraceptives; but in case implants the return of fertility would be prompt.

II. Strengthening of Family Planning Logistic System

Demand for contraceptive is growing. In the developing countries it is estimated that 212 million additional women would be using contraceptives in 2015 compared to that in 2000. Increased demand requires not only more contraceptives and thus more funds to obtain them, but also a stronger supply chain to deliver them. As demands grow, cost will rise not only for procurement but also for distribution, staff training and other key aspects of logistics. With the increase in pressure, logistics operations have to become more efficient.

The objectives of logistic management are: to deliver the right product, in right quantity, in the right time and for right cost; in the context of family planning logistics, it is often complex. Contraceptive supply chains consists of many organizations, people, and procedure that together must accurately forecast the demand and then efficiently order and deliver the contraceptive materials from one level to the next until these reach the family planning clients.

Essentials of Good Logistics

Consistent supply depends on both adequate funding and good logistics activities, including accurate estimates of supply needs, efficient procurement practices, and reliable and timely deliveries. The following steps are crucial:

1. Improve management and staff performance.

2. Improve logistics management information system (LMIS)
3. Improve forecasting and procurement.
4. Improve distribution
5. Ensure adequate funding for contraceptive security. In developing countries, continued support from donors would be vital.

III. Appropriate Training of Concerned Health Personnel

Providing implants require detailed planning. Since implants are a provider- dependent method, introducing or expanding implant services requires that the programmes have the capacity to deliver the method appropriately. This includes:

- a) Have the equipment and facilities needed to provide implants;
- b) Staff appropriately trained to perform insertions and removals, and to properly counsel new and continuing clients. Many different cadres of health care personnel can be trained.
- c) Well-functioning logistic system to maintain the supply of implants and other contraceptives.

Competency-based Training Works Best

It ensures that each provider gets enough training and supervised practice to insert and remove implants correctly. Training also covers counseling, which includes preparing clients to expect bleeding changes.

PROBLEMS OF TRANSFER OF TECHNOLOGY FROM THE CLINIC TO THE FIELD

Transfer of contraceptive technology which has been developed and tested in a controlled environment of the clinics to open society in the field is a complex process; because, in a field situation many other factors, which did not exist in clinic environment, become crucial in the acceptance and continued use of contraceptives. To be successful, it would be important to make the technology suitable or adaptable to the culture of the people and capabilities of the service system. At the same time the people in the community have to be properly educated to make them receptive and the service system should be appropriately strengthened. It would be absolutely essential to develop appropriate methodology and guidelines for introduction of contraceptives in the field by undertaking

operational studies by a competent multi-disciplinary group. This group should include clinical expert, social scientist, operations research specialist, trainer and educator, programme officer and administrator. Initially, such study may be undertaken in a limited area, and with gaining of experience it can be extended to other areas in an incremental fashion. While designing operational study, factors, which affect the acceptability and continuation rate of contraceptives, as enumerated earlier, must be taken into consideration. In fact, for successful programme introduction of any new contraceptive and even for promotion of existing methods, similar approach should be followed.

PROGRAMME INDUCTION STEPS

Approach and Administrative Arrangements

Introduction of contraceptives in a mass programme requires technical skills, proper follow-up, logistics of procurement, storage and supplies, and proper coordination among health personnel and various agencies/organizations. Strategically, it would be important to initiate the programme in collaboration with some district hospitals. Subsequently, the programme may be extended to other district hospitals. The whole programme is to be organized with an operational study approach.

After the selection of the district hospital, the state and district health authorities are to be contacted and apprised of the proposed operational study, which would be followed by introduction of contraceptives in mass programme. The objectives of the study and the collaboration and assistance needed are to be explained. The details of plan of action are also to be discussed.

Preparation of the Community

The community leaders are to be identified and contacted. The purpose and the advantages of the contraceptive programme are to be explained and their cooperation is solicited.

Based on the available information, appropriate 'information, education and communication (IEC)' programme should be planned. The type of the message to be communicated to the individuals and the community has to be determined. The IEC programme, which has to be sustained, should be initiated prior to introduction of contraceptives and vigorously pursued during the

programme implementation. Special educational and motivational campaigns are to be launched. For such mass programme, promotional strategy would be most vital to maximise acceptance. Proper educational materials and aids are to be developed for mass communication as well as for group and inter-personal communication.

Doubts and misconceptions regarding menstruation, contraceptives etc. should be removed and favorable attitudes are to be created. Transfer of value system should be done gradually and tactfully. Support of the private practitioners, other health functionaries and voluntary agencies is also to be ensured.

Preparation of Service Agency

The objectives of the operational study and the plan of action are to be laid down. Background materials including manuals are to be prepared for the education and training of the doctors and para-medical staff. These should include the details of the delivery system, operational directives, talking points etc.; check-lists for individual screening of clients by para-medical staff; guidelines for management such as follow-up schedules, list of possible complications and their managements etc. Arrangements for proper record keeping and reporting are to be made.

Orientation and Training of Doctors and Para-medical Staff

This training is to strengthen the knowledge and skill of the doctors for the common gynaecological disorders, proper education, motivation and selection of clients, technical aspects of contraceptives including management of complications. They should be trained properly for organizing, implementing and evaluating field trials in their respective areas. Stress should be laid on the need of their realizing the importance of various factors, which influence contraceptive acceptance and practice. Developing a proper attitude and faith in contraceptives would be very important. It should also be impressed upon them that psychological preparation of the couple, and especially of the woman, as well as involvement of male partners would be vital. They should be well oriented to proper counseling techniques.

Since the para-medical staff has to provide an important supportive role, their training is of paramount importance for the sustenance of the programme. They would be involved in education, motivation and preliminary screening of the

clients, and follow-up services including proper counseling and provision of psychological support. The aim of their training would be to provide appropriate knowledge and develop proper skill and attitude.

The designing and conduction of training courses should be based on educational technology guidelines.

Screening and Follow-up of all Clients by Para-medical Staff

The initial screening of the prospective clients and provisional selection will be done by para-medical staff with the help of a check-list. Final selection would be done by the gynaecologist/trained medical officer. During the follow-up carried out by the para-medical staff, if there is any problem the clients are to be reassured and the matter is to be brought to the notice of the doctors. Appropriate corrective measures would be taken. The process continues.

Monitoring and Control of the Programme

For regular monitoring and control of the programme there should be proper record keeping and reporting system. The coordinator should regularly visit the participating hospitals and centres for getting a feedback, as well as for providing technical guidance and support wherever needed.

Assessment of the Programme

The programme will be assessed periodically, and if there are any problems corrective measures are to be taken. There should be an in-built mechanism for evaluation of the process as well as the impact and for proper feedback enabling gradual improvement of the programme.

Extension of the Programme to the Rural Areas

Once the programme in the urban area is stabilized and with the availability of the experience the programme will be extended to the primary health centres (PHCs). Subsequently, with gaining of further experience the programme will be extended to other districts and PHCs to make it a mass programme.

CONCLUSION

For checking uncontrolled population growth and for proper reproductive health care, effective contraception is vital. Although contraceptive prevalence rate (CPR) in India has considerably improved in recent years mainly due to female sterilization, there is an urgent need for promoting spacing methods. Currently use of spacing methods by women is very marginal oral pills (3 per cent) and IUD (3%). As a result, the unmet need for contraception particularly among young women is very high. As a corrective measure, use of long-term hormonal injectable and implant contraceptives can play an important role.

Injectable contraceptives, either containing only progestogen (DMPA and NETEN) or estrogen plus progestogen (Cyclofem and Mesigyna), provide almost complete effectiveness with reliable reversibility.

Contraceptive implants are also highly effective, comparable to IUDs, female sterilization and vasectomy, and there is immediate return of fertility after their removal. Norplant, a six capsule implant system containing levonorgestrel was first introduced in mid 1980s; it was effective for 5-7 years. After November, 2008 it will no longer be available.

The new contraceptive implants are small, thin, flexible plastic rods, each about the size of a matchstick, that release a progestin hormone, either levonorgestrel (Jadelle and Sino-Implant-II) or etonogestrel (Implanon), in the body. Like Norplant the new implants are highly effective, and like Norplant they alter bleeding patterns. Their most important improvement over Norplant is easier and quicker insertion and removal. Sino-Implant (II) may also cost much less than other implants.

Both injectable and implant contraceptives cause menstrual bleeding changes. But with proper counseling and support, continuation rates of both are high. For successful introduction and adaptation of these two types of methods in family planning programmes would need special emphasis on the following:

- 1) Proper counseling of clients before and during use of these methods.
- 2) Organization of proper logistic system for procurement of contraceptive and their delivery to the clients.

- 3) Appropriate training and retraining of all concerned staff in administering these methods, counseling of clients and in the logistics support needed.

REFERENCES

1. Banerjee SK, Baveja R and Bhatt RV et al. (1986). Return of Fertility Following Discontinuation of An Injectable Contraceptive- Norethisterone Enanthate (NETEN) 200 mg Dose. *Contraception* 34 (6): 573-582.
2. Bassol S and Garza-Flores J (1994). Review of Ovulation Return after Discontinuation of Once a Month Injectable Contraceptives. *Contraception* 49 (5): 441-453.
3. Bassol S, Hernandez C, and Nava MP et al. (1995). A Comparative Study on the Return of Ovulation Following Chronic Use of Once a Month Injectable Contraceptives. *Contraception* 51(5): 307-317.
4. Brache V, Faundes A, and Alvarez F et al. (2006). Transition from Norplant to Jadelle in a Clinic with extensive experience providing contraceptive implants. *Contraception* 73(4): 364-367.
5. Chikamata DM and Miller S(2002). Health Services at the Clinic level and Implantable Contraceptives for Women. *Contraception* 65(1): 97- 106.
6. Croxatto HB (2002). Mechanisms that Explain the Contraceptive Action of Progestin Implants for Women. *Contraception* 65(1): 21-27.
7. Fuchs N, Prinz H, and Kack U(1996).Attitudes to Current Oral Contraceptive Use and Future Developments: the Women's Perceptive. *European Journal of Contraception and Reproductive Health Care* 1: 275-284.
8. Gold MA,and Coupey SM (1998). Young Women's Attitude Towards Injectable and Implantable Contraceptives. *Journal of Pediatrics, Adolescence and Gynaecology* 11: 17-24.
9. Gu S, Sivin I, Du M, and Zhang L et al. (1995). Effectiveness of Norplant Implants through Seven Years. A Large-scale Study in China. *Contraception* 5(2): 99-103.
10. Hall PE and WHO Task Force on Research on Introduction and Transfer of Technologies for Fertility Regulation (1994). The Introduction of Cycloferm into National Family Planning Programmes. Experience from Studies in Indonesia, Jamaica, Mexico, Thailand and Tunisia, *Contraception* 49 (5): 489-507.

11. Hall PE, Bahamondes L, Diaz J, and Petta C (1997). Introductory Study of Once a Month Injectable Contraceptive Cyclofem in Brazil, Chile, Columbia and Peru, *Contraception* 56(6): 353- 359.
12. ICMR Task Force on Hormonal Contraception (1984). Comparative Evaluation of Contraceptive Efficacy of Norethisterone Enanthate (200mg) Injectable Contraceptive Given Every Two or Three Months. *Contraception* 30(6): 561-574.
13. ICMR Task Force on Hormonal Contraception (1990). A Multi-centre Phase III Comparative Study of Two Hormonal Contraceptive Preparations Net-Oen (50mg) plus E2 Valerate (5 mg) Given Every Two Months as Intra-Muscular Injection. A Report of a 12 Month Study. *Contraception* 42 (2): 179-190.
14. International Institute for Population Sciences (IIPS) and Macro International (2007). National Family Health Survey (NFHS-3; 2005-2006), India: Key Findings, IIPS, Mumbai.
15. Kaunitz AM (2000). Injectable Contraception: New and Existing Options. *Obstet. Gynecol. Clinic North Amer.* 27 (4): 741- 780.
16. Kesseru EV, Aydinlik S and Etchepareborda JJ (1994) Multicentred Phase III Clinical Trial of Norethisterone Enanthate 50 mg plus Estradiol Valerate 5 mg as a Monthly Injectable Contraceptive; Final Three Year Report. *Contraception* 50: 329-337.
17. Koetsawang S. (1994). Once a Month Injectable Contraceptives: Efficacy and Reasons for Discontinuation, *Contraception* 49(4): 387-397.
18. Lande RE (1995). New Era for Injectables. Population Reports, Series K, No. 5, Baltimore, Johns Hopkins School of Public Health, Population Information Programme.
19. Lande RE (2002). Performance Improvement. Population Reports, Series J, No. 52, Baltimore, Johns Hopkins School of Public Health, Population Information Programme.
20. Lande R and Richey C (2006). Expanding Services for Injectables. Population Reports, Series K, No.6, Baltimore, Johns Hopkins School of Public Health, Population Information Programme.
21. Lei Zhen–Wu, Wu Shang Chun and Garceau R J et al. (1996). Effect of Pretreatment Counseling on Discontinuation Rates in Chinese Women Given Depo- medroxy Progesterone Acetate for Contraception. *Contraception* 53: 353-357.
22. Liew DFM, NG CSA, Young YM, and Ratnam SS (1985). Long-term Effects of Depo-Provera on Carbohydrate and Lipid Metabolism. *Contraception* 31(1): 51-64.

23. Newton JR, Darcangues C and Hall PE (1994). Once a Month Combined Injectable Contraceptives, *J. Obstet Gynec* 14 (suppl.1): 51-54.
24. Perkin GW (1980). Contraceptive Introduction. In G.L. Zatuchni et al. Eds. *Research Frontiers in Fertility Regulation*. Harper Row Publishers, London. P 83.
25. Power J, French R and Cowan F (2007). Subdermal Implantable Contraceptives Versus Other Forms of Reversible Contraceptives or other Implants as Effective Methods of Preventing Pregnancy. *Cochrane Database of Systematic Review* (3): CD 001326.
26. Ramchandran D and Upadhyay UD (2007). Implants: The Next Generation. Population Reports, Series K, No 7, Baltimore, Johns Hopkins Bloomberg School of Public Health.
27. Roy Somnath (1981). Research Development in Population and Health Fields: From Laboratories to Users (Mimeo), Presented at Regional Seminar on Role of Information on Population and Primary Health Care, October, 1981, Seoul, Republic of Korea.
28. Roy Somnath (1983). Introduction of contraceptives in National Family Planning Programme: Injectable And Implants. *Health and Population-Perspectives and Issues* 6(1): 3-22.
29. Roy Somnath (1999). Development of a System of Continuing Education for Reproductive Health Care. *Health and Population- Perspectives and Issues*. 22(3&4): 99-122.
30. Rudy S, Tabbut- Henry J, and Schaefer L et al (2003). Improving and client/provider Interaction. Population Reports, Series Q, No. 1. Baltimore, Johns Hopkins Bloomberg School of Public Health.
31. Sang GW, Shao QX, and GE RS et al (1995). A Multicentred Phase III Comparative Clinical Trial of Mesigyna, Cyclofem and Injectable No.1 Given Monthly by Intramuscular Injections to Chinese Women: Contraceptive Efficacy and Side Effects. *Contraception* 51 (3): 167-183.
32. Schwallie PC and Assenzo JR (1974). The Effects of Depo-Medroxy Progesterone Acetate on Pituitary and Ovarian Function, and the Return of Fertility Following Its Discontinuation: A Review. *Contraception* 10(2): 181-202.
33. Setty-Venugopal V, Jacoby R and Hart C (2002). Family Planning Logistics: Strengthening the Supply Chain. Population Reports, Series J, No. 51. Baltimore, Johns Hopkins Bloomberg School of Public Health.

34. Sivin I, Alverage F, and Mishell DR Jr et al. (1998). Contraception with Levonorgestrel Rod Implants. A 5-year Study in the United States and Dominican Republic, *Contraception* 58 (5): 275-282.
35. Sivin I, Mishell DR, Jr , Diaz S, and Biswas A et al. (2001). Prolonged Effectiveness of Norplant Capsule Implant: A 7-year study. *Contraception* 61(3): 187-194.
36. Skegg DCG (1994). Monthly Combined Injectable Contraceptives and Neoplasia. *Contraception* 49 (5): 435-439.
37. Speidel JJ (1980). Programmatic Requirements for New Means of Fertility Control. In G L Zatuchni et al. Eds. Research Frontiers in Fertility Regulation. Harper Row Publishers, London, p 58.
38. Supanee JA (1998). The Effects of Perceived Change in the Menstrual Pattern on the Acceptability of Fertility Regulating Methods. Ph.D Thesis, University of Exeter, U.K. Quoted in Progress No 52.
39. Tolly E, Loza S, Kafafi L and Cummings S (2005). The Impact of Menstrual Side-Effects on Contraceptive Discontinuation: Finding from a Longitudinal Study in Cairo, Egypt, *International Family Planning Perspectives* 31 (1): 15-29.
40. Upadhyay UD (2001). Informed Choice in Family Planning: Helping People Decide. Population Report, Series J, No. 50. Baltimore, Johns Hopkins University Bloomberg School of Public Health.
41. Upadhyay UD and Ramchandran D (2007). Implants: Tools for Providers. INFO Reports No. 15, Baltimore Johns Hopkins Bloomberg School of Public Health.
42. Weisberg E (1992). The Depoprovera Controversy: Regulatory, Medical and Social Issues. In Zambrano D. Ed Depo-Provera (Medroxyprogesterone Acetate) for Contraception: A Current Perspective of Scientific, Clinical and Social Issues. Proceedings of an International Symposium held on 19-20 November. 1992, 2nd edition, Oxford Clinical Communication, Oxford 1993, p 27-38.
43. WHO (1997). What Makes a Contraceptive Acceptable? PROGRESS in Human Reproduction Research No 43.
44. WHO (1999). Tackling the Problem of Endometrial Bleeding. PROGRESS in Human Reproduction Research No 52.
45. WHO (2002). Making Decisions About Contraceptives Introduction: A Guide for Conducting Assessments to Broaden Contraceptive Choice and Improve Quality of Care. (The Strategic Approach). World Health Organization, Geneva.

46. W.H.O (2006) Sexual and Reproductive Health of Women Living with HIV/AIDS, World Health Organization, Geneva.

PREVALENCE OF ANAEMIA AMONG PREGNANT WOMEN: A COMMUNITY-BASED STUDY IN UDUPI DISTRICT

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ABSTRACT

Anaemia in pregnancy, particularly iron deficiency, is a prominent problem in developing countries. The aim of the present study was to identify the prevalence of anaemia among pregnant women attending ante-natal care units of selected hospitals of Udupi district during 2005-2006. About 1077 pregnant women were screened for anaemia using cyanmethemoglobin method during the first ante-natal visit. The prevalence of anaemia was found to be 50.14 per cent which is nearly equivalent to the prevalence rate reported in the literature for Karnataka. Further, findings of the study revealed that the prevalence was higher among young women, women belonging to low socio-economic status and women with short pregnancy intervals and higher parity. High prevalence rate of anaemia observed in the present study suggests to implement various preventive strategies, especially advocacy and monitoring of the iron and folic acid supplementation.

Pregnancy is not just a matter of waiting to give birth but a joyful and a fulfilling period in a woman's life. It can also be one of the experiences of misery and suffering when complications or adverse circumstances compromise the pregnancy, causing ill health or even death¹. Anaemia in pregnancy is a common and serious problem in developing countries. Anaemia is the term used to describe the condition in which there is a reduction in the concentration of haemoglobin in the blood stream to a level below 11gm/dl for pregnant women.² Forty per cent of all maternal peri-natal deaths are linked to anaemia. Favourable pregnancy outcomes occur (30-45%) less often in anaemic mothers and their infants have less than one and a half of normal iron reserves.³

Key words: Anaemia, Pregnancy, Prevalence, Advocacy and Monitoring, Cyanmethemoglobin

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Anaemia is particularly prominent in South Asia. In India for example, upto 88 per cent of pregnant women are affected⁴. The prevalence of anaemia in urban areas, rural areas and endemic areas of hook-worm infestation is 40 to 50 per cent, 50 to 70 per cent and 90 per cent, respectively. A high prevalence of anaemia in pregnancy was observed (96.5%), of which 22.8 per cent had mild, 50.9 per cent had moderate and 22.8 per cent had severe anaemia in a study conducted in Delhi⁵. The reported incidence of anaemia varied from 40 to 90 per cent in various states of India and contributed to 10 to 15 per cent of the direct maternal deaths⁶.

The National Family Health Survey (NFHS-2) states that 52 per cent of women in India are suffering from anaemia, mainly nutritional. Incidence of anaemia among women is as high as 60 per cent in Assam, Bihar, Orissa and West Bengal. Whereas the prevalence of anaemia is around 54 per cent in Karnataka and only 23 per cent in Kerala⁷. According to Rapid Household Survey-Reproductive Child Health (RHS-RCH) project, the prevalence of anaemia in Kodagu district of Karnataka during 2002 was 61.5 per cent. Among these anaemic pregnant women, 38.5 per cent was mild and 23.1 per cent was moderate⁸.

MATERIALS AND METHOD

The present investigation was conducted to find out the prevalence of anaemia among pregnant women attending ante-natal care units of selected hospitals of Udupi district during 2005-2006. The setting of the study was Udupi district in the State of Karnataka. Udupi district has three taluks viz. Udupi, Kundapur and Karkala. Udupi taluk was chosen randomly for the study. Udupi taluk covers an area of 3575 sq. kms and has population of 11,09,494 (as per 2001 census) with a literacy rate of 79.9 per cent. It has one government and 12 private hospitals, two primary health centers and 7 rural maternity child welfare centers with in-patients and out-patients facilities.

Data were collected from a final sample of 1077 pregnant women using a proforma. Haemoglobin was estimated by cyanmethemoglobin method using the systronic photo calorimeter. The investigator obtained training from the department of haematology and was certified to be competent to perform the test by the head of the department of haematology. The reliability was tested on 20 samples comparing with standardised instrument and there was 100 per cent agreement.

Data were analysed using SPSS 1 version.

FINDINGS

TABLE 1
DEMOGRAPHIC CHARACTERISTICS OF THE SUBJECTS

Sl. No	Characteristics	Ante-natal N=1077 F	%
1	Age in years 17-21 22-25 26-30 Above 30	123 392 432 130	11.4 36.4 40.1 12.1
2	Age at marriage 13-21 22-25 26-30 Above 30	373 481 196 47	34.7 44.7 18.2 4.4
3	Age at first childbirth 15-21 22-25 26-30 Above 30	271 465 294 47	25.2 43.2 27.3 4.3
4	Education Non-literate Below 10 th 10 th Std to below graduation Graduate Post-Graduate	32 390 486 154 15	3.0 36.2 45.1 14.3 1.4
5	Socio-economic status High (35-52) Middle (18-34) Low (1-17)	31 344 702	2.9 31.9 65.2
6	Type of family Nuclear Joint	300 777	27.9 72.1

The study population consisted of 1077 ante-natal women. The sample characteristics of the ante-natal women are shown in Table 1.

Data presented in Table 1 indicate that 40.1 per cent of the pregnant women were between 26 and 30 years of age. 44.7 per cent of the pregnant women got married between 22 and 25 years of age. Similarly, age at first childbirth of women was 22-25 years as per the modified socio-economic scale developed by Srivastava 65.2 percent of the pregnant women belonged to low socio-economic status. Most of them (72.1%) belonged to joint family. Around 81.3 per cent of pregnant women had education below 10th standard to below graduation and post-graduation was only 1.4 per cent.

Prevalence of Anaemia and Its Severity

The prevalence of anaemia was 50.1 per cent among pregnant women (540 out of 1077). Out of 540, 348 (63.5%) had mild anaemia (hb10 to 10.99 gm/dl), 184 (35.0%) had moderate anaemia (hb 7 to 9.9 gm/dl) and 8 (1.5%) had severe anaemia (hb < 7gm/dl).

Further, the prevalence of anaemia was analysed in terms of demographic ,biological, structural and disease variables among ante-natal women. The findings are presented in Tables 2, 3 and 4, respectively.

The prevalence of anaemia was 57.72 per cent among ante-natal women who were in the age group of 17-21 years followed by the age group of 30 and above (50.75%) and 22.29 (48.74%).

The prevalence of anaemia was 59.80 per cent among ante-natal women who got married below 18 years of age. This indicates that early marriage predisposes the risk for occurrence of anaemia in pregnancy. Higher prevalence of anaemia was seen among women with education below 10th standard (54.36%). Even the prevalence of anaemia among post-graduate pregnant women was 33.33 per cent. The prevalence of anaemia was 54.27 per cent among ante-natal women who belonged to low socio-economic status. There was no difference in the status of prevalence of anaemia among the women between joint and nuclear family (Table 2).

TABLE 2
PREVALENCE OF ANAEMIA ACCORDING TO SELECTED DEMOGRAPHIC
VARIABLES

Variables	Ante-natal N=1077				
	Non-anaemic n=537		Anaemic n=540		
	f	%	f	%	Total
Age in years					
17-21	52	42.28	71	57.72	123
22-29	387	51.26	368	48.74	755
30 and above	98	49.25	101	50.75	199
Age at marriage (in years)					
Below 18	37	40.20	55	59.80	92
19- 21	134	47.70	147	52.30	281
22-29	343	52.00	317	48.00	660
30 and above	23	52.30	21	47.70	44
Age at first childbirth					
Below 21	120	44.28	151	55.72	271
22-29	381	51.80	355	48.20	736
30 years and above	36	51.40	34	48.60	70
Education					
Non-literate	11	34.40	21	65.60	32
Below 10 th	178	45.64	212	54.36	390
10 th and below graduation	253	52.06	233	47.94	486
Graduate	85	55.19	69	44.81	154
Post-graduate	10	66.67	5	33.33	15

Variables	Ante-natal N=1077				
	Non-anaemic n=537		Anaemic n=540		
	f	%	f	%	Total
SES					
High (35-52)	18	58.06	13	41.94	31
Middle (18-34)	198	57.56	146	42.44	344
Low (1-17)	321	45.73	381	54.27	702
Type of family					
Nuclear	147	49.0	153	51.0	300
Joint	390	50.19	387	49.87	777

TABLE 3
PREVALENCE OF ANAEMIA ACCORDING TO BIOLOGICAL VARIABLES

Variables	Ante-natal				
	Non-anaemic n ₁ =537		Anaemic N ₁ =540		
	f	%	f	%	Total
Parity					
1-2 (low)	482	51.61	452	48.39	934
3 and more (high)	55	38.46	88	61.54	143
Gestational age in weeks					
Below 20	137	46.92	155	53.08	292
20-28	107	44.96	131	55.04	238
29-40	293	53.56	254	46.44	547
Spacing of children between 1st and 2nd n₁=493, n₂ = 498					
< 1year	40	51.95	37	48.05	77
1-2 year	84	46.93	95	53.07	179
>2 years	118	47.77	129	52.23	247
Body Mass Index					
<19	135	48.91	141	51.09	276
19-26	326	48.01	353	51.99	679
>26	62	62.63	37	37.37	99

The prevalence of anaemia was 61.54 per cent among ante-natal women who had high parity with more than two children. The prevalence of anaemia was 55.04 per cent in ante-natal women who were in the gestational age of 20-28 weeks and 53.08 per cent in ante-natal women who were below 20 weeks. Data presented in Table 3 further reveal that the prevalence was nearly equal in ante-natal women having body mass index below 19 (51.09%) and 19-26 (51.99%).

Prevalence of Anaemia According to Disease and Structural Variables

Information in regard to disease variable included was presence of worm infestation among ante-natal women. Out of 134 ante-natal women, 31 of them had worm infestation, of which, 48.39 per cent was anaemic. Data with regard to structural variables are presented in Table 4.

TABLE 4
PREVALENCE OF ANAEMIA ACCORDING TO STRUCTURAL VARIABLES

Variables	Ante-natal				
	Non-anaemic n=537		Anaemic n=540		
	f	%	f	%	Total
Knowledge					
> Median	287	54.56	239	45.44	526
< Median	250	45.37	301	54.63	551
Food selection ability					
> Median	269	50.47	264	49.53	533
< Median	268	49.26	276	50.74	544

The prevalence of anaemia was 54.63 per cent among ante-natal women who had inadequate knowledge about anaemia. Similarly, inability to select food rich in iron, protein and vitamin C seemed to be responsible for increased occurrence of anaemia (50.74%) (Table 4).

Discussion

Anaemia in pregnancy continues to be a health problem. The overall prevalence of anaemia was 50.14 per cent among ante-natal women in the present study which is nearly equal to the prevalence in Karnataka i.e 54 per cent⁷. Higher prevalence of anaemia (87.4%) was found by Srivastava et al (2005)⁹.

It has been observed in the present study that the prevalence of anaemia was high among younger age group of pregnant women (57.72%) i.e., below 21 years which indicates that the nutritional status of girl child is poor and little attention is paid to the correction of anaemia in the pre-pregnancy period. Very little is done to improve the nutrition of the young girl, the growing adolescent, the married women before her first pregnancy and between pregnancies and after pregnancy ¹⁰. The investigator made an attempt to study the dietary habits of the pregnant women in the region under study but objective information could not be collected. However, it was possible to collect information on the ability of selection of food rich in iron, protein and vitamin C. The prevalence of anaemia was 50.74 per cent among those who had poor food selection ability. The population under study mostly consumed rice and less of vegetables, pulses that are rich in iron, protein and vitamin C. Most of the pregnant women consumed iron and folic acid but still anaemia was prevalent among 54.07 per cent of them. The reason could be that 50.85 per cent of the anaemic women started taking iron between 20 and 28 weeks. The other reason could be poor absorption of iron as pregnant women took iron after breakfast. Literature also shows that tea and coffee prevent absorption of iron. The pregnant women who registered early before 12 weeks for ante-natal care and took iron regularly had greater iron reserves, higher haemoglobin levels and a lower prevalence of anaemia ^{11,12}.

Hardships imposed by gender, poor nutrition, extremes of age, primiparity or grand multiparity and short pregnancy intervals revealed their significant influence on haemoglobin concentration¹³. In the present study, low socio-economic status, high parity, and low BMI (<19) contributed significantly to the higher prevalence of anaemia in pregnancy.

CONCLUSION

Anaemia continues to be a problem with the existing health care resources. Socio-economic status, literacy of women and awareness related to health concerns are the major determinants that contribute to the problem of anaemia. Therefore, public health education/information on reproductive health, monitoring the compliance of women with ante-natal care services, and strengthening of their health care seeking behaviour are important health care measures to be undertaken at the community level.

Also, it is time for realization that health system should focus on various factors that contribute to the occurrence of anaemia and include them as an important indicator in the national health care policy.

REFERENCES

1. World Health Organisation (2005). Make Every Mother and Child Count. ([http:// www.who.int/2005/en/index.html](http://www.who.int/2005/en/index.html))
2. World Health Organisation (1991). Prevention and Management of Severe Anaemia in Pregnancy (Report of a Technical Working Group). Geneva: WHO. (WHO/FHE/MSM/93.5).
3. Bothwell TH and Charlton RW (1981), Iron Deficiency in Women. Washington DC, Nutrition Foundation.
4. World Health Organization (2001), WHO Global Database on Iron Deficiency Anaemia and Micronutrients, Geneva; WHO Publication.
5. Virender P, Gautam, Bansal Y, Taneja DK and Saha R (2002) Prevalence of Anaemia Amongst Pregnant Women and Its Socio-demographic Associate in Rural Area in Delhi, *Indian Journal of Community Medicine*, Vol (XXVII), 4.
6. Mudaliar AL and Menon MK (2005) .Clinical Obstetrics. Orient Longman, Hyderabad, 147.
7. NFHS (2002). India 1998-1999 National Family Health Survey-2. Anaemia Among Women and Children. Mumbai: International Institute for Population sciences.
8. ([http:// www.rchindia.org/rep/kar/kodagu](http://www.rchindia.org/rep/kar/kodagu)).
9. Srivastava A, Prabha T, Quershi S and Das Vinita (2005). Anaemia in Pregnancy- A Novel Regime of Intramuscular Iron Therapy, *Journal of Obstetrics and Gynaecology of India*, 55(3), 237-240.
10. Winikoff B (1998). Women's Health An Alternative Perspective for Choosing Interventions.[Electronic version]. *Studies in Family Planning*, 19(4), 197-214
11. Milman N, Bergholt T, Byg KE, Ericksen L and Graudal N (1999). Iron Status and Iron Balance During Pregnancy. A Critical Reappraisal of Iron Supplementation,. *Acta Obstet. Gyneco Scand*, 78 (9),749-57.
12. Ray SK, Mallick S, Kumar S and Biswas (2000). A Rapid Assessment of Anaemia in Pregnancy in West Bengal with Special Reference to Care Seeking Behaviours of Mothers. *Indian Journal of Public Health*, 46 (2),58-64.

13. Gandhan SV, Prathinidhi AK and Gupta AH (1998) Nutritional Assessment of Women in the Reproductive Age Group from ICDS Slum Areas in Pune City, *Indian Journal of Community Medicine*. 22 (2), 70-73.

IMPACT ASSESSMENT OF INDIA POPULATION PROJECT (IPP-VIII) ON CHILD HEALTH IN METROPOLITAN CITIES OF INDIA

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ABSTRACT

To strengthen the maternal and child health care, Government of India with the assistance of World Bank has implemented India Population Programme IPP-VIII in the slum population of four metropolitan cities viz. Bangalore, Delhi, Hyderabad and Kolkata in 1993 for a period of seven years. One of the objectives of the programme was to strengthen the maternal and child health care services so as to reduce infant, child and maternal mortality rates in urban slums by expanding the service delivery system to slum population by construction of additional facilities. After the completion of the project period, the end line evaluation of the project was undertaken. The Ministry of Health and Family Welfare, Government of India, commissioned the National Institute of Medical Statistics; formerly known as Institute for Research in Medical Statistics (ICMR) as the nodal agency for carrying out the end line evaluation of the programme. In the present paper, impact of the programme especially on child health is assessed.

Key Words: IPP-VIII Programme, Slum Population, Impact, Child Health

In India, slums remain a significant feature in metropolitan cities. The population in the urban areas has been increasing steadily for the past few decades due to migration. Most of the migrants come from poor households and they find accommodation in slums. Due to resource constraints, State Government/Municipal Corporation found it difficult to provide minimum standard of civic services like education and health to these inhabitants. Thus, Government of India, with the assistance of World Bank implemented the Eighth India Population Project (IPP-VIII) with the objectives of (i) reducing fertility by improving access to and demand for family planning services; and (ii) improving maternal and child health by decreasing maternal and infant mortality rates among slum populations in the four metropolitan cities viz. Bangalore, Delhi, Hyderabad, and

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Kolkata. The programme was implemented in 1993 for a period of seven years to provide quality integrated primary health care services to the urban poor. Mid-term review of the programme was carried out during 1997-1998 and after the completion of the project period, the end line evaluation of the project was undertaken.

The Ministry of Health and Family Welfare, Government of India, commissioned the National Institute of Medical Statistics then Institute for Research in Medical Statistics (ICMR) as the nodal agency for carrying out the end line evaluation of the programme. The endline survey was carried out during 2001-2002.

To achieve the objectives of the programme, the programme managers adopted three strategies. Firstly, the health and family welfare service delivery system in slum population were expanded by upgrading the existing health facilities and in addition to these, some new health facilities were constructed under the project. Secondly, the demand for family welfare services was increased through information, education and communication (IEC) and participation of NGOs and lastly, to improve the quality of family welfare services, capacity building of medical as well as of para-medical personnel was provided. Mid-term review of the programme was conducted during 1998 to see the progress of the programme. The end line survey was planned with the view that it would be useful in identifying the programme's institutional strength and weakness as well as to facilitate designing of future programmes. Also it was conducted to see the impact of the programme on the outcome and process indicators. The outcome/impact indicators considered under the programme were infant mortality rate (IMR), crude birth rate (CBR), total fertility rate (TFR) and birth order of 3 and above. The process indicators considered were contraceptive prevalence rate (CPR); utilization of health facilities and immunization of children between 12 and 23 months. This paper presents the impact of the programme especially on child health. The indicators considered for child health were IMR, immunization status of children between 12 and 23 months and accessing the facilities for institutional deliveries¹.

MATERIALS AND METHOD

A sample of 4000 households was estimated for each of the four cities with 95 per cent confidence level and 2.5 per cent as margin of error on the lowest parameter, the age specific fertility rate which was 15 per cent for this multi-objective study. These households were covered in the form of 100 clusters from

each city and from each cluster 40 households were selected for the study. Therefore, a uniform multistage stratified sampling design was adopted to select the desired sample size of the households where slum was taken as cluster. In these metro cities, circles/zones constituted strata. In each circle/zone, the slums or clusters were arranged according to the year of implementation of the programme. The sample of 100 slums (clusters) was divided among the strata by allocating the sample proportional to the total number of slums in these strata. In each stratum, clusters were selected with probability proportion to size (PPS). Within each selected slum or cluster, a sample of 40 households was selected with systematic random sampling¹. Therefore, a household was the ultimate sampling unit. The fieldwork was conducted through NGOs appointed by the respective municipal corporation of the city. Specific survey instruments for household survey were developed to collect the data. For ensuring the quality of the results, supervision of field work was conducted by the National Institute of Medical Statistics. Data were analyzed through SPSS package.

FINDINGS AND DISCUSSION

In order to assess the impact of the programme, the present status of the impact indicators have been compared with the baseline survey. The household characteristics of the slum are presented for four cities in Table 1.

TABLE 1
PER CENT DISTRIBUTION OF HOUSEHOLDS BY HOUSING
CHARACTERISTICS

Housing Characteristics	City			
	Bangalore	Delhi	Hyderabad	Kolkata
Electricity				
Yes	94.9	97.1	92.9	86.9
No	5.1	2.9	7.1	13.1
Sources of drinking water				
Open well	1.3	0.1	4.6	1.9
Tube well	3.9	1.6	9.7	4.0
Hand pump	-	14.3	2.6	27.8
Piped water	73.8	80.7	80.1	65.1
Others	-	3.4	3.1	1.2

Housing Characteristics	City			
	Bangalore	Delhi	Hyderabad	Kolkata
Sanitation facility				
Open field/No facility	8.2	21.4	8.6	4.3
Public flush toilet/Sulabh toilet	15.9	63.5	3.8	5.4
Shared flush toilet	41.2	4.2	6.2	47.9
Own flush toilet	34.7	10.1	80.8	42.1
Others	-	0.2	0.6	0.2
Type of fuel used for cooking				
Dung cakes	0.4	4.6	0.2	1.6
Fire wood	10.6	12.6	4.7	14.6
Coal/coke	0.1	1.1	0.8	39.6
Kerosene	58.9	52.8	66.0	13.2
LPG	25.4	27.1	28.0	30.5
Others	4.6	1.8	0.3	0.5
Type of house				
Pucca	91.2	51.0	59.6	72.8
Semi-pucca	4.2	35.0	35.2	23.3
Kuchcha	4.6	14.0	5.2	3.9
Persons per room				
<3	-	17.5	8.8	40.2
3-4	-	34.6	80.3	39.4
5+	-	47.9	10.9	20.4
Mean number of persons per room	-	4.5	5.5	2.8
Number of households	1800	3981	3977	3793

Study found that the slums of Delhi and Hyderabad were more crowded as compared to other two cities. Most of the slums have pucca houses with shared flash toilets system. The standard of living Index (SLI), was calculated by adding

the following scores to see the standard of living of households in the slums of four cities (Table-2).

Type of house: 4 for pucca, 2 for semi-pucca, and 0 for kachha;

Source of lighting: 2 for electricity, 1 for kerosene or gas and 0 for other source of lighting;

Main Source of drinking water: 2 for tube well, hand pump, or piped water, 1 for open well, and 0 for other source water.

Fuel mainly used for cooking: 2 for liquid petroleum gas, 1 for coal/coke/cow or kerosene, and 0 for cow dung or other fuel;

Toilet facility: 2 for own flush toilet, shared flush toilet or public flush toilet/Sulabh toilet, and 0 for no facility;

Ownership of durable goods: 3 each for refrigerator, television, scooter/motor cycle/moped, telephone, 2 each for radio, bicycle, fan/cooler, bullock cart, water pump, any livestock, and 1 for clock/watch.

(The assignment of the scores was based on the approach adopted in National Family Health Survey.)

TABLE 2
PER CENT DISTRIBUTION OF HOUSEHOLDS BY THE STANDARD OF LIVING INDEX (SLI)

Standard of Living Index	City			
	Bangalore	Delhi	Hyderabad	Kolkata
Low	11.6	25.0	14.6	21.3
Medium	59.6	68.1	72.4	62.9
High	28.8	6.9	13.0	15.8

Three categories were formed on the basis of the scores provided, category 0-13 as low, 14-23 as medium and 24 and above as high. It has been

observed from the table that about one-fourth of the households in Delhi and Kolkata were from low SLI and little over one-tenth in Bangalore was from low SLI. In Delhi more than 90 per cent of slums were basti type depicting thereby only 7 per cent belonging to high SLI category.

Infant Mortality is an important indicator for child health. The infant mortality rate (IMR) in areas under IPP-VIII by city is presented in Table 3. It has been observed that the infant mortality rate (IMR) in Bangalore declined from 78 infant deaths per 1000 live births in 1993 (Baseline Survey)² to 22 infant deaths per 1000 live births during 1999-2001 (end line survey), an average decline of about 8 infant deaths per 1000 live births per year. A comparison of the decline in IMR in Karnataka state between two rounds of National Family Health Surveys suggests an average decline of nearly 2 infant deaths per 1000 live births per year.

TABLE 3
INFANT MORTALITY RATE FOR THE THREE-YEAR PERIOD PRECEDING THE SURVEY

City	Infant Mortality Rate (IMR)	
	Baseline	Endline
Bangalore	77.8	22.3
Delhi	100.0	52.6
Hyderabad	81.0	69.4
Kolkata	55.6	25.6

The estimate of the IMR in Delhi at the end line survey during 1999-2001 was about 53 infant deaths per 1000 live births, whereas, the IMR reported in baseline survey^{3 4 5} was 100 deaths per 1000 live births, an average rate of decline of about 7 infant deaths per 1000 live births per year. A comparative change in Delhi between NFHS-1 and NFHS-2 survey was only about 3 infant deaths per 1000 births per year.

In Hyderabad, the decline in IMR was also significant, an average rate of decline of about 2 infant deaths per 1000 live births per year. The comparative

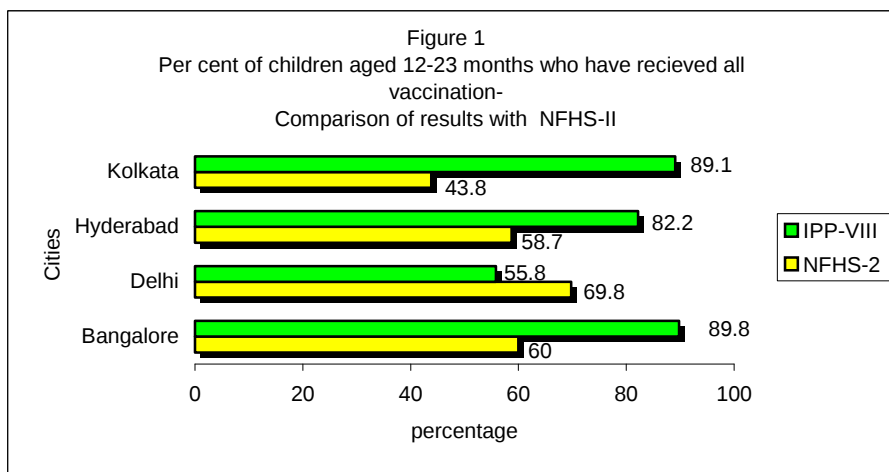
change in Andhra Pradesh between NFHS-1 and NFHS-2^{6 7} was less than one infant death per 1000 live births.

The estimate of IMR for the baseline survey was not available for Kolkata. A comparison of IMR obtained in mid-term survey (34 infant deaths per 1000 live births) with the estimate of IMR in endline survey (26 infant deaths per 1000 live births) indicated an average decline of about 3 infant deaths per 1000 live births per year, again, a sharp decline.

It may be noted that in each of the four cities under India Population Project-VIII, the rate of infant mortality decline was higher than the corresponding figure for the state. It indicates that there was an impact of the programme on Infant Mortality Rate.

Child Immunization

Child immunization also reflects the status of child health. Under the Universal Immunization Programme, three vaccinations against BCG, DPT and Polio were given within one year of child. The children who had received BCG, measles and three doses of DPT and polio drops were considered as fully immunized. The per cent of children aged 12-23 months who have received all vaccination were compared with NFHS-II. The percentage of children who were fully vaccinated was 90 each in Bangalore and Kolkata, 82 per cent in Hyderabad and only 56 per cent in Delhi(Fig.1).



Low level of coverage for measles was found to be the main factor for the low achievement of full immunization coverage in Delhi.

TABLE 4

PERCENTAGE OF CHILDREN AGED 12-23 MONTHS WHO RECEIVED/DID NOT RECEIVE ANY DOSE

	Bangalore (n)	Delhi (n)	Hyderabad (n)	Kolkata (n)
Male	0.0 (132)	3.1 (289)	NA	0.8 (130)
Female	0.0 (105)	4.0 (250)	NA	1.5 (131)
All Children	0.0 (237)	3.5 (539)	2.0 (611)	0.9 (261)

It was found from the study that percentage of male children were higher irrespective of the city as compared to female children. The percentage of children who did not receive any vaccination was found to be more in Delhi (3.5 per cent) as compared to other cities. It is also clear from the (Table 4) that more number of male children were vaccinated as compared to female children.

Table 5 presents the sources of vaccination in Delhi. About 20 per cent utilized government hospitals for vaccination in Delhi while it was about 75 per cent in Hyderabad and 14 per cent in Kolkata. Health post/sub-centre created under IPP-VIII were used by about 70 per cent in Delhi and 74 per cent in Kolkata. It suggests the utilization of the infrastructure created under IPP-VIII project. However, Government hospitals in Hyderabad were the major source of childhood vaccinations. This information was not collected in Bangalore. The utilization of these facilities shows the impact of the programme on child health.

The table also shows that 86 per cent in Delhi, 97 per cent in Kolkata and 70 per cent in Hyderabad were satisfied with the clinic hours/days of vaccination.

It was found that more than 90 per cent of births were institutional in Bangalore, Hyderabad and Kolkata while this was only 28 per cent in Delhi which may be due to migrant population and many of the maternity homes in Delhi were functional during the last phase of the project and the beneficiaries were not aware of the facilities (Table 6).

TABLE 5
SOURCES OF CHILD VACCINATIONS
 PERCENTAGE DISTRIBUTION OF CHILDREN AGE 12-23 MONTHS WHO
 RECEIVED ANY VACCINATIONS BY SOURCE AND SATISFACTION WITH
 CLINIC HOURS/DAYS

Sources	City		
	Delhi	Hyderabad	Kolkata
Government/Municipal Hospital	20.4	74.8	13.6
Maternity homes (IPP-VIII)	2.5	0.8	1.1
Maternity homes (MCD)	0.5	-	-
Health centre (IPP-VIII)/ESOPD	36.6	-	0.9
M&CW centre (MCD)	2.0	-	-
Health post (IPP-VIII)/Sub-centre	30.3	7.8	71.8
Private doctor/Pvt. Hospital/Mat.			
Home /clinic	3.7	14.8	6.9
NGO hospital	0.2	0.7	-
During camp in the cluster	3.7	0.8	3.2
Others	0.0	0.2	2.5
Percentage satisfied with clinic hours/days of vaccination	85.6	70.3	97.5

TABLE 6
 CHANGES IN KEY PROCESS INDICATORS (%)

Indicator	Bangalore		Delhi		Hyderabad		Kolkata	
	Base - line ²	End line	Base Line ³	Endline	Base Line ⁴	End-line	Base Line ⁵	End-line
Institutional Delivery	76.9	92.1	14.3	27.8	72.0	96.5	53.9	89.0
Fully Immunized Children 12- 23 months	49.6	89.8	62.0	55.8	50.0	82.2	57.1	89.1

CONCLUSION

Overall, the impact of the programme was satisfactory. A significant improvement was observed in institutional deliveries in the endline survey as compared to baseline survey indicating an impact on the utilization of health care facilities. An intervention is still required to encourage the women in slum area of Delhi for institutional deliveries for the safety of their life. Significant reduction was also observed in infant mortality rates and fertility rates at the end of the project as compared to baseline survey. Endline survey (ELS) showed that coverage of individual vaccination, such as BCG, DPT and Polio was satisfactory in all the four cities. There was an improvement of fully vaccinated children from baseline survey to endline survey and the facilities created under the project were used for vaccination which leads to the conclusion that programme had an impact on child health.

ACKNOWLEDGEMENT

Authors are extremely indebted to the Ministry of Health for entrusting the National Institute of Medical Statistics then Institute for Research in Medical Statistics (ICMR) as the nodal agency for providing technical advice, monitoring and supervision of end line survey. Authors are grateful to the World Bank for their continuous interaction and timely feedback. Authors are thankful to Dr. D Sahu and Dr. Nandini Roy for data analysis and compilation of results for the study. Appreciations are also due to the staff of this Institute for their co-operation in conducting the fieldwork.

REFERENCES

1. Endline Evaluation of IPP-VIII (combined): Institute for Research in Medical Statistics (ICMR) 2003- Final Report
2. Mid-term Review, *IPP VIII*: Annexure (1998), Center for Research in Health and Social Welfare Management, Bangalore.
3. Mid-term Review Report for IPP-VIII, Delhi (1998), Municipal Corporation of Delhi.
4. Report on Baseline Survey and Beneficiary Need Assessment Survey-IPP VIII (1993), Council for Social Development, Hyderabad.

5. Mid-term Review Report of Health Facilities under IPP-VIII, Calcutta: Final Report.
6. IIPS. International Institute for Population Sciences (1995) National Family Health Survey, India 1992-93 Mumbai. IIPS.
7. International Institute for Population Sciences and ORC, Macro (2000) National Family Health Survey (NFHS-2), India 1998-99, Mumbai.

AWARENESS ABOUT CONTRACEPTIVE PRACTICES AMONG YOUTHS IN DELHI

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ABSTRACT

Young people in India represent almost one-fourth of the total population and face significant risks related to their sexual health. Many lack information and skills necessary to make informed health choices. Therefore, this study was conducted to determine the level of awareness about contraceptives among youths residing in rural and urban slums of Delhi. A sample consisting of 211 youths was selected, 112 from a rural community and 99 from an urban slum to obtain information on various aspects of contraceptives.

The study revealed that (i) nearly 9 out of 10 (89.1%) youths were aware of at least one contraceptive method and out of them 81.5 per cent had heard about condoms; (ii) however, awareness about emergency contraceptives was poor among them (6.2%); (iii) similarly, the adoption of terminal methods was as low as 9.5 per cent by them while the use of condoms was somewhat better (39.3%); (iv) dispensary (68.7%), chemist shops (65.4%) and grocery shops (7.1%) were the sources of supply of condoms for the youths; (v) 42.6 per cent of youths perceived that population control was the only advantage of contraceptives, however, a small proportion of them stated that contraceptive prevents HIV/AIDS; and (vi) awareness about side-effects of contraceptives was also low among youths.

Key Words: Contraceptives, Awareness, Youths, Media, Availability

Adolescence and youth are two stages of development which bridges between childhood and adulthood. These stages bring changes in mental process and personal identity. These also include transition from total socio-economic dependence to relative independence. Among these two, an adolescence stage is more vulnerable. The generation now entering the adolescence is the largest in

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human history. Adolescents face profound changes which take place within them. The rapid growth in height, body shape and the development of secondary sexual characteristics are the major ones. These can cause immense emotional upheavals, loss of self-value, anxiety and confusion.

In India, adolescents comprise 23 per cent of the total population.¹ Median age at marriage of girls is 16 years that could be responsible for 16 per cent of teen pregnancies.² These young girls face a considerable risk during pregnancy and childbirth.

Young people experience critical and life defining events viz. first marriage, first sexual inter-course and parenthood. Promiscuous sexual behaviour, pregnancy and venereal diseases are considered as some of the serious problems in adolescence in developed³⁻⁷ and developing countries.⁸ Young people between 10 and 25 years of age make up 50 per cent of all new HIV/AIDS infections in the country.⁹ Adolescents need to protect themselves from unsafe sex, unwanted pregnancies, early childbearing, unsafe abortion and sexually transmitted diseases.

MATERIALS AND METHOD

This cross-sectional study was carried out to assess the awareness about contraceptives among youths in Delhi. A sample of 211 subjects was drawn from *Barwala* (rural Delhi) and *Balmiki basti* (an urban slum of Delhi). These are the field practice areas of the Department of Community Medicine, Maulana Azad Medical College, New Delhi. Out of 211 youths, 112 (58 males and 54 females) from Barwala and 99 (50 males and 49 females) from Balmiki Basti were interviewed to get the information on contraceptives. Age group selected for the study was according to United Nations 'youth age group' from 16 to 25 years. Systemic random sampling method was used for selection of subjects. Data were coded and analyzed using 'Epi info 2004' programme on computer. Simple proportions of awareness and use of contraceptives among youths were calculated and any significant difference between the proportions of rural and urban youths were further analyzed by using appropriate statistical tests such as χ^2 , Fischer and t test.

FINDINGS

In this study, a significant number of Hindu youths (90%) were selected, more in urban slum as compared to rural community ($p=0.0003$). Other

characteristics were comparable (Table 1). 89.1 per cent of the total youths were aware of at least one method of contraception. Significantly more number of rural youths were aware of condoms (90.2%) as compared to urban (71.7%). However, use of condom was low in both the groups 54.5 per cent and 28.2 per cent, respectively. Similarly, awareness about oral contraceptive pills was 72.7 per cent among urban and 69.6 per cent among rural youths but awareness of use was low. Awareness about terminal methods among youths both in rural (35.7%) and urban slums (16.1%) was much lower as compared to other contraceptive methods. Rural and urban difference was statistically significant (0.001). Awareness regarding side-effects of these contraceptives is dismal in the study population. As far as emergency contraceptive was concerned, very less number of rural (6.2%) and urban (6.8%) youths were aware about it (Table 2).

TABLE 1

DEMOGRAPHIC CHARACTERISTICS OF STUDY SUBJECTS

Characteristics	Rural n1=112	Urban Slum n2=99	Total N=211	X² /fisher/ t test	p value
Age (in Yr) X ± SD	19.8+2.8	19.4+3.7	19.7+3.3	0.78	0.4
Income (in Rs) X ± SD	4019.2+4157.7	4115.0+3326.9	4059.1+3824.4	0.17	0.86
	n=112 (%)	n=99 (%)	N=211 (%)		
Sex					
Male	58 (51.8)	50 (50.5)	108 (51.2)	0.03	0.85
Female	54 (48.2)	49 (49.5)	103 (48.8)	0.03	0.85
Religion					
Hindu	109 (97.3)	82 (82.8)	191 (90.6)	12.86	0.0003
Others	3 (2.7)	17 (17.2)	20 (9.4)		

(Figures in parentheses indicate percentage.)

Majority of the youths believed that condoms were the best form of contraceptives both before (24.6%) and after (24.4%) marriage as well as after childbirth (17.0%). Only 9 per cent of youths in urban slum favoured condom use as compared to 38.4 per cent in rural areas. This difference was significant ($\chi^2=24.3$; $p=0.0001$). The urban youths preferred oral pills over condoms as contraceptive after childbirth but awareness about terminal methods was poor among urban youths (Table 3).

TABLE 2

AWARENESS ABOUT THE USE AND SIDE-EFFECTS OF VARIOUS
CONTRACEPTIVES AMONG YOUTHS IN DELHI.

Characteristics	Rural n=112 (%)	Urban Slum n=99 (%)	Total N=211 (%)	χ^2 /fisher test	p value
Aware of Names	101 (90.2)	87 (87.9)	188 (89.1)	0.2	0.59
Condom					
Aware of Names	101 (90.2)	71 (71.7)	172 (81.5)	11.0	<0.00 1
Aware of Use	55 (54.5)	28 (28.2)	83 (39.3)	3.77	0.05
Side-effects	2 (1.8)	5 (5.0)	7 (3.3)	Fisher	0.25
Oral Pills					
Aware of Names	78 (69.6)	72 (72.7)	150 (71.1)	0.07	0.79
Aware of Use	36 (46.2)	32 (32.3)	68 (32.2)	0.04	0.83
Side-effects	2 (1.8)	25 (25.2)	27 (12.8)	25.9	<0.00 1
IUCD					
Aware of Names	75 (67.0)	41 (41.4)	116 (55.0)	8.87	0.002
Aware of Use	28 (37.3)	14 (14.1)	42 (20.0)	1.2	0.73
Side-effects	9 (8.0)	14 (14.1)	23 (10.9)	2.02	0.15
Terminal Methods					
Aware of Names	40 (35.7)	16 (16.1)	56 (26.5)	10.30	0.001
Aware of Use	14 (12.5)	6 (6.0)	20 (9.5)	0.03	0.86
Side-effects	0	0	0		
Emergency Contraceptives					
Aware of Names	7 (6.2)	7 (6.8)	14 (6.6)	0.06	0.81

(Figures in parentheses indicate percentage.)

TABLE 3

USE OF CONTRACEPTIVES IN VARIOUS SITUATIONS

Characteristics	Rural n=112	Urban Slum n=99	Total N=211 (%)	χ^2 / fisher test	p value	
Condoms						
Before marriage	43 (38.4)	9 (9.0)	52 (24.6)	24.3	<0.001	
After marriage	34 (30)	17 (17.2)	51 (24.4)	4.98	0.02	
After childbirth	31 (27.7)	5 (5.0)	36 (17.0)	19.0	<0.001	
Oral Contraceptive Pills (OCPs)						
Before marriage	1 (0.9)	0 (0)	1(0.5)	Fisher	1.0	
After marriage	14 (12.5)	10 (10.1)	24 (11.4)	0.3	0.5	
After childbirth	4 (3.5)	8 (8.0)	12 (5.7)	1.9	0.1	
Intra-Uterine Contraceptive Device (IUCD)						
Before marriage	0 (0)	1(0)	1(0.5)	Fisher	1.0	
After marriage	7(6.2)	8 (8.0)	15 (7.6)	0.3	0.5	
After childbirth	11(9.8)	9 (9.0)	12 (5.7)	0.03	0.8	
Sterilization						
Before marriage	0	0	0			
After marriage	0	0	0			
After childbirth	15 (13.4)	0 (0)	15 (7.6)	14.3	<0.001	

(Figures in parentheses indicate percentage)

Seventy four per cent of youths stated that decision about contraceptive use could be taken by either sex. More females than males took decision about contraceptive use. 63.5 per cent of the youths had used contraceptives at least once and they also had knowledge about easy availability of contraceptives (81.5%). When they were asked about the place of availability, they stated that contraceptives can be obtained from dispensary, chemist shops and grocery shops (Table 4).

42.6 per cent of youths perceived that population control was the only advantage of contraceptives, however, a small proportion of youths perceived that it could help in both HIV (10.4%) and pregnancy (9.5%) prevention. Rural youths were better informed and more comfortable in talking about contraceptives with their friends as compared to urban youths ($p<0.001$). TV and radio (65%) were the most common sources of information for youths about contraception. School was

also one of the sources of information for about 22.2 per cent of the youths (Table 5).

TABLE 4

**DECISION TO USE AND AVAILABILITY OF CONTRACEPTIVES FOR YOUTHS
IN DELHI**

Characteristics	Rural n=112 (%)	Urban Slum n=99 (%)	Total N=211 (%)	χ^2 /fisher test	p value
Who makes decision about contraceptives use?					
Male	7 (6.3)	10 (10.1)	17 (8.0)	1.05	0.30
Female	19 (16.9)	19 (19.2)	38 (18.0)	0.18	0.67
Either	86 (76.7)	70 (70.7)	156 (73.9)	1.01	0.31
Of similar age group uses contraceptives					
Yes	56 (50.0)	52 (52.5)	108 (51.2)	0.13	0.71
Use of contraceptives by themselves					
Yes	73 (65.2)	61 (61.6)	134 (63.5)	0.29	0.59
Availability of contraceptives					
Dispensary	84 (75.0)	61 (61.6)	145 (68.7)	4.38	0.03
Chemist	75 (67.0)	63 (63.6)	138 (65.4)	0.26	0.61
Grocery shop	13 (11.6)	2 (2.0)	15 (7.1)	7.3	0.006
Contraceptives are easily available					
Yes	95 (84.8)	77 (77.7)	172 (81.5)	1.73	0.18

(Figures in parentheses indicate percentage.)

Significantly less number of urban youths (11.1%) as compared to rural youths (22.3%) believed that right age of marriage for male should be less than 21 years ($p=0.03$) but they desired (27.2%) to have more than two children ($p<0.001$). Majority of youths (87.7%), on an average, stated that age of marriage for female should be more than 18 years. There is no rural and urban difference as far as birth spacing is concerned. But majority (81.5%) believed that it should be more or less than three years (Table 6).

TABLE 5

ADVANTAGES AND SOURCES OF INFORMATION FOR YOUTHS AND THEIR COMFORTNESS IN TALKING ABOUT CONTRACEPTIVES IN DELHI

Characteristics	Rural n=112 (%)	Urban Slum n=99 (%)	Total N=211 (%)	χ^2 /fisher test	p value
Advantages of contraceptives					
Population control	53 (47.0)	37 (37.4)	90 (42.6)	2.1	0.14
Pregnancy control	19 (17.0)	1 (1.0)	20 (9.5)	15.6	<0.001
HIV control	17 (15.0)	5 (5.0)	22 (10.4)	5.7	0.01
Sources of information					
Parents	2 (1.8)	2 (2.0)	4 (1.9)	0.1	1.0
School	26 (23.2)	21 (21.2)	47 (22.2)	0.1	0.72
Peers	29 (26.0)	43 (43.4)	72 (34.1)	7.2	0.007
Newspapers	29 (26.0)	15 (15.1)	44 (20.8)	3.7	0.05
TV/Radio	77 (68.7)	60 (60.6)	137 (65.0)	1.5	0.21
Whom youths would feel comfortable talking about contraceptives					
Relatives	14 (12.5)	8 (8.0)	22 (10.7)	1.1	0.29
Parents	24 (21.4)	18 (18.2)	42 (19.9)	0.3	0.55
Friends	72 (64.3)	7 (7.0)	79 (37.4)	73.4	<0.001
Spouse	104 (92.8)	91 (91.2)	195 (83.4)	0.1	0.71

(Figures in parentheses indicate percentage.)

DISCUSSION

The distribution of youths in rural community and urban slum was comparable with respect to age and total family income except religion. In the present study, it was found that majority of youths had heard of contraceptives (89%) but awareness regarding use and side-effects was low. High awareness about oral contraceptive pills and condoms can be attributed to an active social marketing programme that has promoted the use of pill and condom since mid 1970s. According to a multi-centric study conducted on unmarried rural

adolescents, awareness about contraceptives was low¹⁰ viz. [tubectomy (11.2%), condoms (12.3%), oral contraceptive pills (11.3 %), vasectomy (9.7%) and IUCD (6.2 %).] Awareness about other methods and techniques was low in other studies also.¹¹

TABLE 6
PERCEPTION OF YOUTHS ABOUT RIGHT AGE OF MARRIAGE, NUMBER OF CHILDREN AND SPACING IN BETWEEN THE CHILDREN

Characteristics	Rural n=112 (%)	Urban Slum n=99 (%)	Total N=211 (%)	χ^2 / fisher test	p value
Age of male marriage					
< 21 years	25 (22.3)	11 (11.1)	36 (17.1)	4.67	0.03
≥ 21 years	87 (77.7)	88 (80.9)	175 (82.9)		
Age of female marriage					
< 18 years	18 (16.1)	8 (8.1)	26 (12.3)	1.94	0.16
> 18 years	94 (83.9)	91 (91.9)	185 (87.7)		
Number of children desired					
≤ 2 children	110 (98.1)	72 (72.7)	182 (86.2)	28.79	<0.001
> 2 children	2 (2.0)	27 (27.2)	29 (13.8)		
Spacing in between two children					
< 3 years	20 (17.9)	17 (17.2)	37 (17.5)	0.02	0.89
≥ 3 years	92 (80.4)	82 (82.7)	172 (81.5)		

(Figures in parentheses indicate percentage.)

Knowledge about use of various contraceptives was poor varying from 6 per cent for terminal methods to 54.5 per cent for condoms in the present study. This shows that media were the sources of information for most of the sample population (65%), which may have provided just superficial information on the use of contraceptives. Awareness about emergency contraception was almost nil among youths. In contrast, emergency contraception is highly promoted and widely used in developed nations.

For a long time, contraceptives particularly condoms have been projected as a population control device. In the present study, 47 per cent of youths knew that condom is used for family planning and 3.8 per cent also knew about other

advantages such as HIV and STD control. This finding highlighted that the current efforts of National AIDS Control Programme and Reproductive and Child Health Programme on condom need to focus on adolescents and youths.

The contraceptives are easily available, however, overall awareness about their availability in most of the countries in Asia is poor, for example, Pakistan (59%) and Bangladesh (70%). In Sri Lanka, it was high (90%).¹² In the present study majority (81.5%) stated that contraceptives are easily available. Most of the rural youths were comfortable in talking about contraceptives with their spouse (92.8%) as well as with their friends (64.3%) as compared to urban youths (7%). This could be due to better social ties in rural area than in urban slum. 86.2 per cent of youths in Delhi favoured two children and 98 per cent in rural area also desired so which is higher than other study (71.6%) conducted on unmarried rural adolescents.⁴

More awareness about contraceptives in Delhi could be attributed to the factors such as geography, income, presence of media, better educational programmes, etc. The fact is that the area under study is associated with a teaching institution which could be another factor. However, indepth knowledge about contraception among youths is lacking and needs to be improved through educational and behaviour change programmes.

From the study, it is concluded that awareness about contraception among youths is superficial with reference to its use, side-effects and purpose. Despite many decades of family welfare programme in the country, awareness about the use and side-effects of various contraceptives remains low. The other advantages of condom such as HIV and STD prevention were not known to the youths. Therefore, more emphasis should be on behaviour change communication activities and health education/adolescent health education may be started at the school level itself.

REFERENCES

1. Government of India. The Census of India (2001). Registrar General of Census.
2. International Institute for Population Sciences. National Family Health Surveys. Key findings 1998-1999 and 2005-2006. International Institute for Population Sciences, Mumbai.
3. Looney JG and Oldham DG, Normal Development. In Kaplan HZ, Sadock BJ (Eds), Comprehensive Textbook of Psychiatry. Baltimore: William and Wilkins Publication
4. Kishore J, Singh A, Grewal I, Singh SR and Roy K. Risk Behaviour in An Urban and Rural Male Adolescent Population. *Nat Med Journal of India* (1999);12 (3):107-110.
5. Litt IE. Special Health Problems During Adolescence. In. Behrman, Kliegman, Jenson Nelson's Textbook of Paediatrics (16th Ed) Vol.1. Harcoute Asia Saunders Asia.
6. Kay le (1995) Adolescent Sexual Intercourse: Strategies for Promoting Abstinence in Teens. *Postgrad Med* (1995): 97:121-7; 132-4.
7. Sharma V and Sharma A.(1997) Adolescent Boys in Gujarat, India: Their Sexual Behaviour and Their Knowledge of Acquired Immuno Deficiency Syndrome and Other Sexually Transmitted Diseases. *J Dev Behaviour Pediatr*.Dec; 18 (6):399-404.
8. WHO.(1993) The Health of Young People: A Challenge and A Promise. Geneva .
9. Kishore J.(2007) The National Health Programme of India: National Policies and Legislation Related to Health. New Delhi: Century Publications.
10. Gupta N, Mathura AK, Singh MP and Saxena NC (2004) Reproductive Health Awareness of School-Going, Unmarried, Rural Adolescent. *Indian Journal of Paediatrics* (2004) 71 (9): 797-801.
11. Akoijam BS, Hanjabam SD and Thangjam ND (2005) Knowledge and Attitudes of Males Regarding Birth Spacing and Contraception. *Ind J Public Health* 49 (1) : 30-31.

12. Pachauri S and Santhya KG (2002) Reproductive Choice for Asian Adolescents: A Focus on Contraceptive Behaviour. *International Family Planning Perspectives*; 28 (4): 186-195.

SURVEY OF IMMUNIZATION COVERAGE AND ANC LEVELS IN DELHI

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ABSTRACT

The survey of immunization coverage (CES) was undertaken on the request of Department of Family Welfare, Government of Delhi, in all the nine districts of Delhi State to know the coverage level of fully immunized children and mothers against Tetanus Toxoid (TT) and ANC coverage level among pregnant mothers.

The evaluation covered all the vaccines viz., BCG, DPT, OPV and Measles for children and TT for pregnant women. The survey revealed that the immunization programme could touch about 96 per cent of target children and about 93 per cent of pregnant women. About 83 per cent of children received all the vaccines (BCG, DPT, OPV and Measles) and 93 per cent of pregnant women received at least one ANC and 91 per cent received TT2/Booster. It has been observed that coverage was low among children belonging to Muslims, scheduled caste/tribes, illiterate parents and low socio-economic status. The literacy of mother is the key to the success of the Universal Immunization Programme (UIP). Hence, efforts should be made to organise Information, Education and Communication (IEC) activities to educate the mothers about the importance of immunization and ANC.

Keywords: Fully immunized, Modified 30 cluster methodology, Children, Pregnant Women

The universal immunization programme (UIP) was implemented in 1985 with an aim to cover all the children below the age of one against the six vaccine preventable diseases. The successful implementation of the programme will ultimately lead to control, elimination and eradication of various vaccine preventable diseases. Further, the programme will not only bring down the IMR, improve the health status of the community but also will give assurance to the parents about survival and longevity of their children. It will indirectly help the

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parents to adopt small family norm as well as help in population stabilization.

NIMS on the request of Government of Delhi undertook the coverage evaluation survey on 'Immunization of children as well as ante-natal care of pregnant women'. The survey was undertaken during February-June 2006.

The objectives of the survey were to find out the coverage levels of fully immunized children, ANC coverage levels among pregnant mothers and reasons for non/poor acceptance of immunization programme by the community.

METHODOLOGY

The survey was undertaken in Delhi covering all the nine districts. In each district, 450 children and 450 mothers were covered using WHO 30 cluster methodology^{1 2 3}. All wards/villages were arranged according to the size of the cluster, SC/ST population and female literacy for selection of PSUs. Thereafter, 30 PSUs were selected using PPS systematic sampling. From each PSU/cluster, 15 children were selected in the form of three clusters of five children each (5 each from 3 locations with random starts). Similarly, a sample of 15 mothers (5 from 3 locations with random starts) were selected. In all, 4050 infants and 4050 mothers were covered. Since sampling at district level is self-weighting, the sample proportion is unbiased estimates of corresponding population proportions. District level estimates have also been obtained for all antigens and complete immunization. Estimate of immunization coverage level has thereafter been calculated at the State level. Special analysis has been attempted for children with partial coverage.

FINDINGS AND DISCUSSION

As per the profile of the households, sample broadly represents all the groups as per 2001 census. This profile could be used while interpreting the results for variations in different districts.

The immunization programme could touch about 96 per cent of target children. About 83 per cent of children had received all the vaccines (BCG, DPT, OPV and Measles). The coverage was very impressive in North-East (88.7%) followed by East (87.8%) and South (86.3%). However, coverage in Delhi shows an improvement of about 20 percentage points over NFHS-3⁴ and DLHS (02-04)⁵ (Table 1).

TABLE 1**IMMUNIZATION STATUS OF CHILDREN (%)**

	Immunization level		
	Complete	Partial	Not
Delhi	83.2	13.0	3.8
North West	79.8	15.5	4.7
North	85.1	10.4	4.4
North East	88.7	9.8	1.6
East	87.8	7.3	4.9
NDMC	78.8	16.2	5.1
Central	85.1	12.0	2.9
West	83.9	12.2	3.9
South West	73.1	24.2	2.7
South	86.3	9.3	4.4
NFHS-3 (Delhi)	63.2		
DLHS 02-04	61.0		

TABLE 2**IMMUNIZATION STATUS OF CHILDREN ACCORDING TO HEPATITIS AND
MMR ANTIGEN (%)**

State/ District	Hepatitis B I	Hepatitis B II	Hepatitis B III	MMR
Delhi	92.0	90.1	87.3	39.5
North West	92.9	89.4	86.3	45.5
North	94.2	92.9	91.1	33.0
North East	94.9	93.8	91.8	24.4
East	89.8	89.8	89.6	53.1
NDMC	85.4	83.2	79.6	35.6
Central	96.2	93.8	92.0	35.1
West	90.2	88.9	85.0	39.1
South West	89.8	87.1	80.9	38.7
South	91.8	90.5	88.7	39.9

By and large, it can be concluded that the coverage levels were similar in all the districts, except South West. It may be because the area represented the district comprised mostly the resettlement colonies, slums, etc (Table 1).

It would appear that the coverage of Hepatitis (three doses) were impressive. It was noted that these vaccines were given along with DPT. The coverage for MMR is about 40 per cent (ranges from 24.4% to 53.1%) (Table 2). There was some gender difference in the coverage levels especially in three districts, viz. North West, West and South West. In some districts, the trend was the other way round.

Partial Immunization Who Missed Immunization By Only One Vaccine

The antigens responsible for partial immunization have been discussed in Table 3. Overall, 13.0 per cent of the children were partially immunized, of which 6 per cent of the children missed only one vaccine. Of these, the maximum contribution was by measles (5.23%).

TABLE 3

IMMUNIZATION MISSED BY SINGLE VACCINATION

Single Vaccine	Per cent
BCG	0.34
DPT	0.12
OPV	0.39
Measles	5.23
Missed by only one vaccine	6.08
Missed by more than one vaccines	6.92
Partially immunized	13.0

Reasons for Non-Immunization

It has been found that among the non-immunized children, more than half of the mothers (59.6%) were unaware of the need for giving immunization to their children. About 10.6 per cent of the mothers were not knowing the place of immunization and also not having faith in it. About one-third of the mothers of drop out cases were also not fully aware of need for full doses of immunization (Table 4).

TABLE 4**REASONS FOR MISSING SINGLE VACCINATION (%)**

Reasons	Drop Outs	Not Immunized
Unaware of need for immunization	21.1	59.6
Unaware of need to return for 2/3 dose	14.2	
Place/time of immunization unknown	6.2	5.2
Fear of side-effects	4.8	3.4
Misconceptions	1.2	1.4
Postponed until the next time	9.2	
No faith in immunization	2.8	5.4
Place of immunization	3.7	4.1
Inconvenient time for immunization	2.7	4.1
Vaccinator was absent	1.2	
Vaccine was not available	0.5	
Mother was too busy	1.0	3.4
Family problems including illness of mother	9.4	4.7
Ill health of Child (not brought)	5.6	
Ill health of Child (brought but not given immunization)	8.7	2.0
Long waiting time	1.8	
Others	5.9	6.7

Immunization Status of Children According to Sex, Religion, Literacy Level and Socio-Economic Conditions

It has been observed that coverage was low among children belonging to Muslims and scheduled caste/tribes. Coverage was high among the children whose parents were: in government job, with high qualification, residing in pucca houses, having facility of tap water for drinking, flush as toilet facility, electricity and L.P.G facility for cooking (Table 5).

Ante-Natal Care of Pregnant Women

Ninety three per cent of mothers received at least one ANC and 82.7 per cent received three or more ANC. This shows an improvement of about 10 percentage

points in case of those who received at least one ANC and 15 percentage points for those who received three or more ANC as compared to NFHS-2⁶ (Table 6). Further, it can be seen that the number of women who received at least one ANC was 83.5 per cent in NFHS-2 and 74.4 per cent in NFHS-3. Similarly, institutional deliveries and delivery conducted by trained persons were more in the present survey as compared to NFHS-2 and NFHS-3.

TABLE 5

IMMUNIZATION STATUS OF CHILDREN ACCORDING TO SEX, RELIGION, LITERACY LEVEL AND SOCIO-ECONOMIC CONDITIONS

		Immunization level		
		Complete	Partial	Not
Combined		83.2	13.0	3.8
Sex	Male	84.9	11.6	3.5
	Female	81.0	14.8	4.2
Religion	Hindu	84.2	12.5	3.2
	Muslim	75.6	16.2	8.2
Caste	SC/ST	79.1	15.5	5.4
	Others	84.5	12.2	3.3
Education of Mother	Illiterate	69.5	20.3	10.2
	Primary	83.0	13.7	3.4
	Higher level of Literacy	93.5	6.3	.2
Education of Father	Illiterate	68.9	20.8	10.4
	Primary	75.9	16.4	7.6
	Higher level of Literacy	92.1	7.6	.3
Type of House	Pucca	86.6	11.0	2.3
	Kuchcha	49.5	35.4	15.1
Drinking Water	Tap water	84.8	12.1	3.1
	Hand pump	68.3	21.2	10.5
Toilet Facility	Flush	86.8	10.9	2.3
	Others	64.5	24.4	11.1
Availability of Electricity		83.8	12.7	3.6
Fuel for Cooking	Gas	86.3	11.1	2.6
	Kerosene	72.2	17.8	10.0

TABLE 6
DETAILS OF ANC RECEIVED BY PREGNANT WOMEN (%)

ANC Details	Present survey	NFHS 2	DLHS (02-04)	NFHS-3
At least one ANC received	93.3	83.5		74.4
3 or more ANC	82.7	68.2		
TT2/Booster	91.3	84.9		
Given any IFA tablets	86.2	77.8		
Institutional deliveries	68.8	59.1	49.9	60.7
Delivery conducted by trained persons	90.3	65.9		65.1

ANC Details of Pregnant Women According to Background Characteristics

Proportion of pregnant women, received ANC were more in general category as compared to scheduled caste/tribes (Table 7). The proportion of pregnant women, who received full ANC were slightly less among the young pregnant women as compared to older age (Table 8). Similar findings were observed in case of husband also. The proportion of illiterate pregnant women or whose husband had no formal education received less ANC facility as compared to those who were having slightly higher education (Table 8).

TABLE 7
ANC DETAILS OF PREGNANT WOMEN ACCORDING TO RELIGION AND CASTE (%)

Religion/Caste		N	Received at least one ANC	Received 3 or more ANC	Received 1st ANC in 1st trimester	Received 2 or more TT	Given any IFA
Combined		4035	93.3	82.6	43.4	84.5	86.1
Religion	Hindu	3343	94.0	82.8	44.3	84.5	86.7
	Muslim	546	90.5	82.6	35.9	84.8	85.0
	Sikh	108	95.4	88.9	59.3	92.6	87.0
	Others	36	80.5	72.2	38.9	72.7	72.7
Caste	SC/ST	1137	91.8	80.4	34.8	81.5	84.0
	Others	2897	94.1	83.8	47.3	86.7	87.4

- Including Christian.

The proportions of complete immunized children were higher among parents who were working in government sector. The proportion of pregnant women or whose husband was in service, either in government or private, were availing of more ANC facility. The pregnant women who belong to better socio-economic conditions were utilizing ANC facility in a better way.

TABLE 8

ANC DETAILS OF PREGNANT WOMEN ACCORDING TO AGE AND EDUCATION (%)

Age/ Education level		N	Received at least one ANC	Received three or more ANC	Received 1st ANC in 1st trimester	Received 2 or more TT	Given any IFA
Age of Pregnant women (Yrs)	<20	395	90.9	80.1	42.5	86.3	80.3
	21-25	1921	93.9	83.0	42.9	84.9	87.0
	26-30	1380	94.2	83.8	45.4	85.1	87.3
	>30	348	91.1	81.0	40.8	80.5	85.3
Age of husband (Yrs)	<20	44	91.7	77.8	36.1	88.9	77.8
	21-25	840	93.7	82.7	43.6	88.1	85.2
	26-30	1958	93.9	83.5	43.8	84.5	87.1
	>30	1202	92.8	81.9	43.3	82.5	86.0
Education of Women	Illiterate	1200	82.5	68.8	29.8	70.9	72.5
	Primary	401	94.3	85.8	39.2	87.5	89.5
	Middle	626	97.6	88.2	41.1	89.5	91.5
	High School	719	97.9	87.5	48.4	89.4	91.9
	Inter	406	99.0	89.4	53.4	91.4	92.9
	Above Inter	692	99.6	91.0	61.0	92.8	93.2
Education of Husband	Illiterate	601	81.2	64.1	21.1	67.2	67.1
	Primary	326	92.6	84.0	41.4	86.2	85.9
	Middle	571	92.1	80.9	35.9	83.7	86.3
	High School	1109	95.0	84.3	44.5	86.1	89.1
	Inter	560	98.2	90.2	50.4	92.7	93.0
	Above Inter	825	98.8	90.2	58.4	89.9	92.6

CONCLUSION

The evaluation covered all the vaccines viz., BCG, DPT, OPV and Measles for children and TT for pregnant women. The survey revealed that the immunization programme could touch about 96 per cent of target children and about 93 per cent of pregnant women. About 83 per cent of children received all the vaccines (BCG, DPT, OPV and Measles) and 93 per cent of pregnant women received at least one ANC and 91 per cent received TT2/Booster. The coverage was low among children belonging to Muslims, scheduled caste/tribes, illiterate parents and low socio-economic status.

The literacy of mother is the key to the success of the Universal Immunization Programme (UIP). Efforts should be made to educate the mothers about the importance of ANC by organising Information, Education and Communication (IEC) activities. Improvement could also be achieved by better follow-up to reduce the dropout rates.

The findings and recommendations of the study will be utilized by the State Governments for improving the programme.

REFERENCES

1. Padam Singh and R.J. Yadav (1998), Immunization Coverage in Bihar, *Indian Pediatric*, Vol. 35, Feb. 156-160.
2. Padam Singh and R.J. Yadav (2000), Immunization Status of Children of India. *Indian Pediatrics*, Vol. 37, Nov. 17, 1194-99.
3. Padam Singh and R.J. Yadav (2000), Ante-natal Care of Pregnant Women of India, *Indian Journal of Community Medicine*, Vol XXV, No. 3, July-Sept, , 112-117.
4. National Family Health Survey (NFHS-3), Fact Sheet, Delhi (2005-06): International Institute for Population Sciences, Govandi Station Road, Deonar, Mumbai-400088.

5. District Level Health Survey (2002-04), International Institute for Population Sciences, Govandi Station Road, Deonar, Mumbai-400088.
6. National Family Health Survey (2002): International Institute for Population Sciences, Govandi Station Road, Deonar, Mumbai-400088.