# Contraceptive Effectiveness: an Approach for International Programs

Effectiveness and safety are often the two most central concerns of contraceptive users. Effectiveness can be improved through contraceptive choices made on the basis of accurate information on comparative pregnancy rates, particularly typical-use rates, short and long term rates, as well as by considering the context of use, such as the locus of control by the woman, man or provider. We emphasize typical-use pregnancy rates, which most accurately express the pregnancy risk for the average user.

Contraceptive effectiveness can vary greatly for methods requiring ongoing performance of both users and providers to achieve correct and consistent use. Oral contraceptives (OCs), barrier methods and traditional methods require consistent and correct use. For methods requiring regular re-supply, a reliable source of commodities and ready access are essential to effective use.

Many couples want no more children and, therefore, desire highly effective and long-term contraception. Many providers give contraceptive pregnancy rates for only the first year of use, even for long-term methods. However, annual pregnancy rates increase over time for some methods and decrease for others. Therefore, providers need to give a clear understanding of the long-term risk of pregnancy, particularly for women and men wanting to use a method for several years.

**Definitions of contraceptive effectiveness rates**[1]

> **Typical-Use Pregnancy Rate:** The pregnancy rate during **typical use** of a contraceptive method.
>
> **Perfect-Use Pregnancy Rate:** The pregnancy rate during **perfect use**, (or correct and consistent use) of a contraceptive method.

Typical-use pregnancy rates are often the most relevant for clients and providers when considering the choice of a method. However, this rate may vary from one setting to another, since it is influenced by consistency and correctness of use, the capacity to conceive (fecundability), the timing and frequency of intercourse, and whether continued correct use is more dependent on the user or provider. Some clients who are very conscientious and motivated may find the perfect-use rates also to be helpful.

The short-term typical-use pregnancy rates in Figure 1 can be used for a relatively simple classification of methods:

**Practical Categories of Contraceptive Effectiveness by Typical-Use Pregnancy Rates**

**Very Good (0-1%)**
Female sterilization
Male sterilization
Intrauterine device (IUD) (CuT 380A)
Injectables (DMPA) (less effective if access limited)
Norplant® implants

**Good (2-12%) (very good with perfect use)**
Combined oral contraceptives (COC)
Progestin-only-pills (POP) (more effective during breastfeeding or lactational amenorrhea method (LAM)

**Fair (15-21%) (good with perfect use)**
Condoms
Diaphragm
Periodic Abstinence
Spermicides

**No Method (85%)**

## METHODS WITH GOOD OR FAIR EFFECTIVENESS

### Barrier Methods and Periodic Abstinence

Condoms, diaphragms, periodic abstinence, and spermicides have typical-use pregnancy rates from 15% to 21% in the first year (Figure 1). Consistent and correct use, or multiple method use, results in lower pregnancy rates. Conversely, erratic and incorrect use leads to rates higher than typical-use pregnancy rates.

### Combined Oral Contraceptives

Combined oral contraceptives (COCs) have a typical-use pregnancy rate of 8%, primarily because of frequent incorrect and inconsistent use.

### Progestin-Only Pills

Progestin-only-pills (POPs) are less effective than COCs for non-breastfeeding women. Typical-use pregnancy rates for POPs are not well documented; we have estimated the rate for POPs to be 12%, or 1.5 times the COC rate.

**Progestin-Only Pills during Breastfeeding**

POPs are generally provided to breastfeeding women (who naturally have a lowered fecundity) thereby, achieving a very high level of effectiveness. In one very large study, the pregnancy rate at 11 months in breastfeeding women using POPs was 1.2%[2].

**Counseling, Supplies and Access for Methods with Good or Fair Effectiveness**

Perfect-use (or consistent and correct use) results in much lower pregnancy rates for each of these methods. However, pregnancy rates higher than for typical-use can occur, particularly if instruction and counseling are poor, and availability and access to supplies are limited (for pills, condoms, and spermicides).

Factors which greatly influence the contraceptive effectiveness of methods need to be clearly presented to clients as they choose a method (See Client-Provider Interaction in Family Planning Services). These factors include:

- continued availability of supplies,
- ability of the client to return for supplies,
- capacity to manage side effects and complications,
- the client's understanding of how to respond to side effects (e.g., irregular menstrual bleeding), missed pills, etc., and
- correct instructions for use.

**Dual or Multiple Method Use for Methods with Good or Fair Effectiveness**

The effectiveness of barrier methods and periodic abstinence may be increased when two or more methods are used together. However, this increase is not well quantified. Dual method use should be particularly attractive when there is a need to reduce the risk of sexually transmitted infection (STI) and human immunodeficiency virus (HIV) infection. Multiple methods to prevent sexually transmitted diseases (STDs) and improve contraceptive effectiveness, particularly where one or more methods is controlled by the woman, will increase consistent use of at least one.

Given the relatively high typical-use pregnancy rates in developing countries (and in developed countries for poorer, less-educated populations), providers should consider supplying clients with back-up methods when possible. Barrier methods can serve the double role of back-up contraceptive protection as well as protection from STDs, including HIV. Hormonal emergency contraceptive pills (ECPs) are another suitable back-up method to prevent pregnancy. Providers may give ECPs routinely to be available in the event she needs emergency contraception, or information about access to ECPs can be provided.

## METHODS WITH VERY GOOD EFFECTIVENESS

The intrauterine device (IUD) (TCu 380A), female and male sterilization, the injectable, DMPA (Depo Provera), and Norplant® implants have very low pregnancy rates at one year. Typical- and perfect-use rates are similar, as long as the method is used. Injectable contraceptives require regular reinjections and supplies, and the risk of pregnancy will increase if these conditions are not met, even though published typical-use rates do not reflect this consideration (see Counseling, Supplies and Access).

Long-term rates can be compared better by perfect-use pregnancy rates, since the methods usually used long-term are less reliant on regular and continued client and provider actions. Therefore, pregnancies are more often due to method failure, rather than user failure. Incorrect or inconsistent use are relatively uncommon causes of pregnancy among long-term methods.

Table 1 provides short and long-term perfect-use pregnancy rates for the most common long-term methods used in developing countries. DMPA is included here, since it is a long-acting method and is often chosen for long-term use.

### Female Sterilization

Female sterilization is one of the most widely used methods of contraception world-wide. Pregnancies are most likely to occur in the first year or two due to errors of the procedure or recanalization. Immediate postpartum contraceptive sterilization (within 48 hours after delivery) is equally or more effective than sterilization performed during the interval between pregnancies, using standard occlusion techniques during minilaparotomy. For couples wanting no more children, an advantage of sterilization is that, being permanent, it will be highly effective well beyond the 5 to 10 year period of other long-term methods.

### IUDs

Based on perfect-use pregnancy rates, the Copper T380A and the future LNG 20 IUDs (20 mcg levonorgestrel) are comparable with female sterilization. The first-year IUD pregnancy rates from the Demographic and Health Survey (DHS) and Center for Disease Control (CDC) surveys represent higher typical use pregnancy rates since effective IUD use is somewhat dependent on continued actions of the client (checking for expulsion), but much less so than for pills, condoms, and barrier methods.

### DMPA

The perfect-use rates for the three month injectable contraceptive, depo-medroxyprogesterone acetate (DMPA), are similar to perfect-use rates for female sterilization, the TCu 380A and LNG 20 IUDs, and soft tubing Norplant® implants, through five years. However, due to dependency on returning for injections and on providers to maintain availability of the method, pregnancy rates may be higher.

### Norplant® Implants

There is no distinction for perfect- and typical-use for Norplant® implants, since there is no ongoing client or provider requirement for effective use, similar to contraceptive sterilization. The primary difference is between hard tubing Norplant® implants, provided in developing countries through mid-1992, compared with the soft-tubing Norplant® implants, now the only version available. Hard tubing pregnancy rates progressively increase over time and are more influenced by body weight than are soft tubing rates, especially in the fourth and fifth years of use. Pregnancy rates for soft tubing Norplant® implants are not so variable and show no increase in year five (See Norplant® Implants).

## SOURCES AND QUALITY OF CONTRACEPTIVE EFFECTIVENESS DATA

Most of the pregnancy rates presented here are from developed countries, in order to provide accuracy and consistency across methods. When possible, typical-use pregnancy rates reflect all pregnancies, including those ending in abortion.

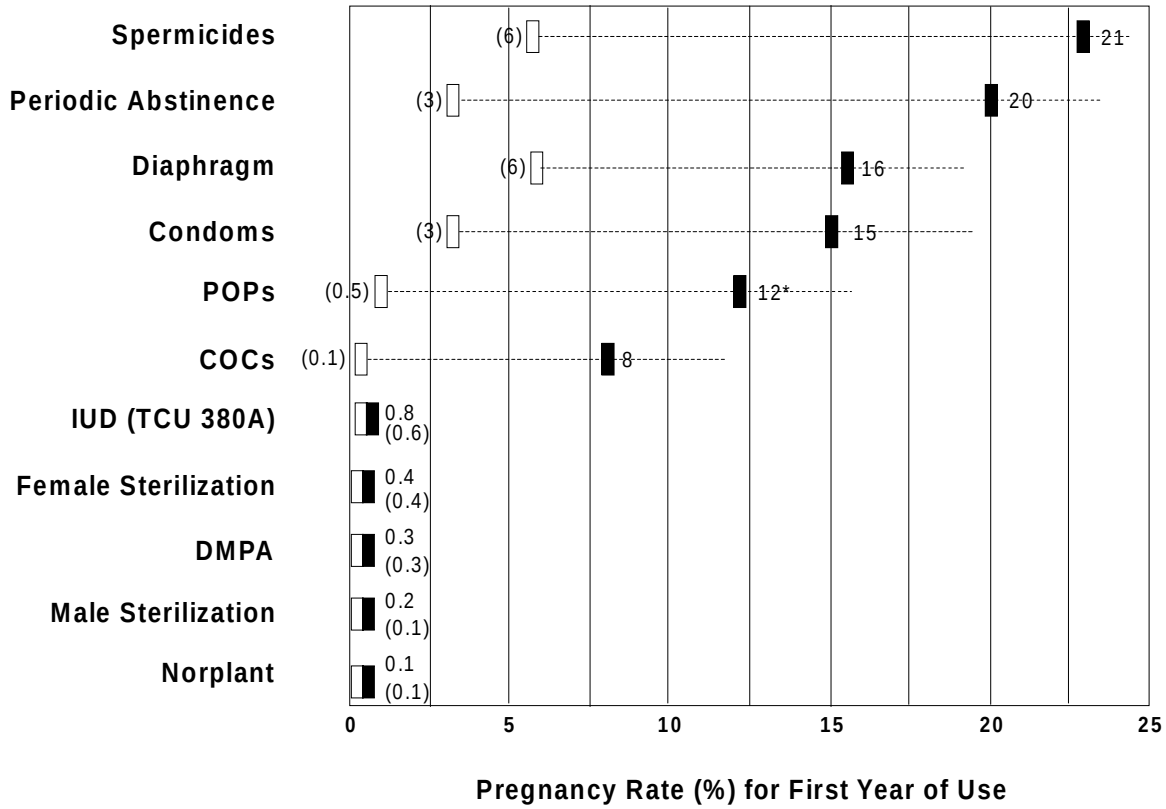
Given the several factors that can influence contraceptive effectiveness, additional sources of information may be helpful at the country level. At present there is no precise mechanism for establishing country-specific pregnancy rates by method. A consensus from experts familiar with the various sources of information may be needed. For example, the 1994 Bangladesh DHS survey reported an oral contraceptive (OC) pregnancy rate of 1.7 [3]. Conversely, Bairagi documented a one-year pill pregnancy rate of 15, almost 10 times higher, in Matlab, Bangladesh, where one would expect pills to be used more correctly and consistently than in the country as a whole[4]. In this same study he reports a pregnancy rate of 1.0 for injectables (DMPA). Presumably the field-worker documentation of actual use of injectables, may make this rate closer to a perfect-use pregnancy rate. Methodology of collecting information is likely to influence the pregnancy rates reported from various studies.

Local studies, such as those from Bangladesh, may be more useful than developed country data (especially data from clinical trials) for methods requiring ongoing client and provider actions.

## CONCLUSION

Typical-use pregnancy rates are often more appropriate than perfect-use rates for clients to use in understanding contraceptive effectiveness, especially for short-term use. Pregnancy rates can be lower or higher than average typical-use rates, depending on the level of consistent and correct use. The methods most often chosen for long-term contraception--sterilization, IUDs, DMPA, and Norplant® implants also have the lowest typical-use pregnancy rates (0-1%); COCs and POPs are higher (2-12%); and condoms, diaphragms, periodic abstinence, and spermicides are highest (15-21%). Long-term (5-year) perfect- or typical-use rates are similar among sterilization, IUDs, DMPA, and Norplant® implants. However, lack of supplies or limited access to injectables, and low continued use may influence reported pregnancy rates in some settings. Use of multiple methods can improve contraceptive effectiveness and prevent STDs, as can other factors, such as whether control of the method is more with women, men, or providers.

**Figure 1. Contraceptive Pregnancy Rates for Typical and Perfect Use, by Method**

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Graphic format adapted from FHI, Contraceptive Technology Update series, Oral Contraceptives, Sept. 1996.

**Table 1: Cumulative Long-Term Pregnancy Rates for Selected Family Planning Methods**

| | Cumulative Pregnancy Rates through Completed Year of Use (pregnancies/100 women) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 7 | 10 | |
| Female sterilization, | 0.06 | 0.4 | 0.5 | 0.5 | 0.6 | 0.6 | 0.8 | 5 |
| Female sterilization, interval* | 0.7 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 2.0 | 5 |
| IUD, TCu 200 | 2.1 | 5.0 | | | | | | 6 |
| IUD, TCu 220C | | | 3.3 | 3.9 | 3.9 | 4.9 | 5.7 | 7,8 |
| IUD, TCu 380A | 0.6 | | 1.0 | 1.1 | 1.4 | 1.6 | 2.1 | 8,9 |
| IUD, LNG 20 | 0.2 | | | | 1.1 | 1.1 | | 10, 11, 12 |
| Injectable, DMPA | 0.3 | 0.5 | 0.9 | 0.9 | 0.9 | | | 13 |
| Norplant implant, Hard | 0.2 | 0.7 | 1.9 | 3.4 | 4.2 | | | 14 |
| Norplant implant, Soft Tubing | 0.1 | 0.1 | 0.5 | 1.0 | 1.0 | | | 14 |

* Female sterilization using standard occlusion techniques during postpartum and interval minilaparotomy

** Not supplied after mid-1992, although clients will require removals in 1997 and beyond

Source: Medical Services, Pathfinder International, July 1996.

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