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Understanding contraceptive failure

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Abstract

Contraceptive failure is a major source of unintended pregnancy. This chapter will review sources of data and measurement of contraceptive failure, summarize results from the literature on the risks of contraceptive failure during typical and perfect use for available methods of contraception, provide a tool for communicating risks of contraceptive failure to clients, examine determinants of contraceptive failure, and identify methodological pitfalls in the published literature.

Keywords

contraception; contraceptive failure

Women rank effectiveness as the most important factor when choosing a contraceptive method.¹ Therefore, it is important to help patients understand factors influencing contraceptive failure.

In the epidemiology literature, the term ‘efficacy’ refers to how well an intervention (in this case, a contraceptive method) works in clinical trials, and the term ‘effectiveness’ refers to how well it works in actual practice. Both sorts of evidence are used in this paper.

SOURCES OF DATA

There are two primary sources of data for estimating contraceptive failure rates: surveys and clinical trials. In the USA, the National Survey of Family Growth (NSFG), a survey of women that collects information on their characteristics, pregnancies and contraceptive use, was conducted in 1973, 1976, 1982, 1988, 1995 and 2002. It has the advantage of being nationally representative, but has twin disadvantages of severe under-reporting of abortion and retrospective reporting of month-by-month contraceptive use and dates of pregnancies. With clinical trials, information is collected prospectively and cycles in which contraception was used correctly and consistently can be identified, although classification depends on self-reported behaviour. Comparison of self-reported oral-contraceptive-pill-taking with computer chip records of pills being punched from the packet has revealed severe over-reporting of adherence.² In addition, there is the problem of inference beyond the trial setting to the general population of users.

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THE RISK OF PREGNANCY DURING TYPICAL AND PERFECT USE

There are four pieces of information that would enhance our understanding of the pregnancy risk for various methods. First, failure rates during typical use, including inconsistent or incorrect use, reflect contraceptive effectiveness. Second, failure rates during perfect use, defined as following the package directions, reflect contraceptive efficacy. Third, failure rates during imperfect use show how effective methods will be if they are used incorrectly or inconsistently. Finally, the percentage of perfect users or percentage of cycles of perfect use reveals how difficult it is to use a given method correctly and consistently. Only information on the first two measures is currently available.

The difference between failure rates during imperfect use and failure rates during perfect use reveals how forgiving a method is of imperfect use. The difference between failure rates during typical use and failure rates during perfect use reveals the consequences of imperfect use. This difference depends both on how unforgiving a method is of imperfect use and on how hard it is to use that method perfectly.

Current understanding of the literature on contraceptive efficacy and effectiveness, summarized in Table 1, is based on a review of more than 200 papers on contraceptive failure.³ The first column lists the contraceptive methods included in this review. The second column gives estimates of the probabilities of pregnancy during the first year of typical use of each method in the USA. Pregnancy rates during typical use reflect how effective methods are for the average person who does not always use methods correctly or consistently, and in fact may not actually even use it at all. In surveys and in most clinical trials, a woman is 'using' a contraceptive method if she reports that she is using that method. Therefore, typical use of the condom could include actually using a condom only occasionally, and a woman could report that she is 'using' the pill even though her supplies ran out several months ago. In short, 'use' is a very elastic concept that depends entirely on an individual woman's perception. The third column gives the best estimate of the probabilities of method failure (pregnancy) during the first year of perfect use. A method is used perfectly when it is used consistently according to the set of rules specified in the product labelling. For many methods, perfect use requires use at every act of intercourse. The fourth column displays the probabilities of continuing use at 1 year.

Information on pregnancy rates during typical use is shown graphically in Figure 1 in a way that clients may find more useful.⁴⁻⁶

TYPICAL USE ESTIMATES

For spermicides, withdrawal, fertility-awareness-based methods, the diaphragm, the male condom, the pill and the 3-month injectable, these estimates were derived from the experience of women in the 1995 NSFG, corrected for under-reporting of abortion, so that the information pertains to nationally representative samples of users.⁷ The estimate for the discontinued 5-year implant was assigned to the new (to the USA) 3-year implant.

The NSFG does not ask for brand of pill; thus, combined and progestin-only pills cannot be distinguished. However, since use of the combined pill is far more common than use of the progestin-only pill, it can be assumed that the results from the NSFG overwhelmingly reflect typical use of combined pills. The efficacy of progestin-only pills may be lower than that for combined pills, since progestin-only pills may be less forgiving of non-adherence to the dosing schedule.

The probabilities of pregnancy for the sponge were based on the results of a clinical trial in which women were randomly assigned to use the diaphragm or sponge.^{3,8} The estimates for

methods such as the copper-T intra-uterine device (IUD), levonorgestrel intra-uterine system (LNG-IUS) and sterilization were derived from large clinical investigations.³ The typical use estimate for the female condom is based on the results of a 6-month clinical trial.⁸ The 12-month probability of pregnancy was projected from the relation between pregnancy rates in the first 6 months and pregnancy rates in the second 6 months for users of the diaphragm, sponge and cervical cap.⁸

The estimate for chance (no method) was based on evidence from clinical investigations.³ The typical and perfect use estimates for the patch and ring were set equal to those for the pill. It is possible that the patch and ring will prove to have better efficacy than the pill during typical use, because of better adherence with the dosing schedule. However, such superior efficacy has not been demonstrated in randomized trials.^{9–11}

PERFECT USE ESTIMATES

Most method failure rates reported in the literature have been calculated incorrectly and are too low (see the discussion of methodological pitfalls below). Correctly computed estimates are available for three fertility-awareness-based methods,^{12–14} the diaphragm,¹⁵ the sponge,¹⁵ the male condom,^{16–18} the female condom¹⁹ and spermicides.²⁰ Estimates for the male condom, the female condom and spermicides are extrapolated from 6-month clinical trials based on the assumption that the pregnancy rate per cycle would remain constant throughout the first year of perfect use.³ The estimate of the proportion becoming pregnant during 1 year of perfect use of withdrawal is an educated guess based on the reasoning that pregnancy resulting from pre-ejaculatory fluid is unlikely.^{21–23} Estimates for sterilization and the implant, injectable, pill, patch, ring, IUD and IUS are based on extensive clinical trials with very low pregnancy rates.³

CONTRACEPTIVE CONTINUATION ESTIMATES

The proportions of women continuing use at the end of the first year for spermicides, withdrawal, fertility-awareness-based methods, the diaphragm, the male condom, the pill and the 3-month injectable were obtained from the 1995 NSFG.²⁴ Only method-related reasons for discontinuation (changing methods or termination of contraceptive use while still at risk for unintended pregnancy) were counted. Other reasons for discontinuing use of a method (such as attempting to get pregnant or not having intercourse) are not counted in the discontinuation rate. For nulliparous users of the sponge, the continuation rate for the diaphragm was used; for parous users, the continuation rate for the diaphragm was adjusted to reflect higher pregnancy rates. For the female condom, the continuation rate for the male condom was adjusted to reflect a higher pregnancy rate. The continuation rates for the patch and ring were set equal to that for the pill. The continuation rate for the 3-year implant was set equal to that for the discontinued 5-year implant, which was derived from the 1995 NSFG.²⁴ Discontinuation rates for the IUD and IUS (for reasons related to the contraceptive) are based on clinical trials.³

EMERGENCY CONTRACEPTION

The effectiveness of emergency contraception merits special discussion, as its intended use is distinct from ongoing methods of contraception. The chance that pregnancy would occur in the absence of emergency contraception is estimated indirectly using published data on the probability of pregnancy on each day of the menstrual cycle.^{25,26} This estimate is compared with the actual number of pregnancies observed after treatment in observational treatment trials. Effectiveness is calculated as $1 - [O/E]$, where O and E are the observed and expected number of pregnancies, respectively.

Calculation of effectiveness, and particularly the denominator of the fraction, involves many assumptions that are difficult to validate. Recent studies have demonstrated that inaccuracies in estimates of when ovulation occurs within a woman's menstrual cycle are common, and most likely lead to inflated estimates of pregnancy risk.^{27,28} In another recent study, cervical smears showed that more than one-third of women requesting emergency contraceptive pills (ECPs) had no sperm present in the vagina, and those with sperm present had fewer sperm than women attempting to become pregnant.²⁹ As the risk of pregnancy for women requesting ECPs is most likely inflated, estimates of ECP efficacy are consequently likely to be overestimates. However, precise estimates of efficacy may not be highly relevant to many women who have had unprotected intercourse, since ECPs are often the only available treatment. A more important consideration for most ECP clients may be the fact that data from both clinical trials and studies on the mechanism of action clearly show that at least the LNG regimen of ECPs is more effective than doing nothing.³⁰

Eight studies of the LNG regimen reported estimates of effectiveness between 59% and 94%.^{31–38} A meta-analysis of eight studies of the combined regimen concluded that the regimen prevents about 74% of expected pregnancies; the proportion ranged from 56% to 89% in the different studies.³⁹ A more recent analysis using possibly improved methodology found an effectiveness of 53% and 47% in two of the largest trials of the combined regimen.⁴⁰ Combined data from two randomized trials that directly compared the two regimens showed a relative risk of pregnancy of 0.51 (95% confidence interval 0.31–0.83), indicating that the chance of pregnancy among women who received the LNG regimen was approximately half that among those who received the combined regimen.^{30,37,38} This estimate makes no assumption about the number of pregnancies that would have been observed in the absence of treatment. The results imply that: (1) if the Yuzpe regimen is completely inefficacious, the LNG regimen has an efficacy of 49%; and (2) for every additional 2 percentage points of efficacy of the Yuzpe regimen, 1 percentage point of efficacy is added to the LNG regimen.

A pilot study of 41 women found that adding a cyclo-oxygenase (COX)-2 inhibitor (meloxicam 15 mg) to 1.5 mg LNG significantly increased the proportion of cycles with no follicular rupture or ovulatory dysfunction (88% vs 66%, $P=0.012$). Adding a COX-2 inhibitor can disturb the ovulatory process after the onset of the luteinizing hormone surge.⁴¹

Over 9400 postcoital insertions of copper-bearing IUDs are known to have been carried out since the practice was introduced in 1976. With only 10 failures, this approach probably has a pregnancy rate no higher than 0.2%.^{42,43} The effectiveness of using the LNG-IUS for emergency contraception has not been studied and is not recommended.

THE LACTATIONAL AMENORRHOEA METHOD

The lactational amenorrhoea method (LAM) is a highly effective, temporary method of contraception. If the infant is being fed only its mother's breast milk (or is only given supplemental non-breast-milk feeds to a minor extent) and if the woman has not experienced her first postpartum menses, breast feeding provides more than 98% protection from pregnancy in the first 6 months following a birth.^{44,45} Four prospective clinical studies of the contraceptive effect of LAM demonstrated cumulative 6-month life-table perfect use pregnancy rates of 0.5%, 0.6%, 1.0% and 1.5% among women who relied solely on LAM.^{46–49}

SIMULTANEOUS USE OF METHODS

Using two methods at once lowers the risk of unintended pregnancy dramatically, provided they are used consistently. If one of the methods is a condom or vaginal barrier, protection

from disease transmission is an added benefit. For example, the probabilities of pregnancy during the first year of perfect use of male condoms and spermicides are estimated to be 2% and 18%, respectively, in Table 1. The annual probability of pregnancy during simultaneous perfect use of condoms and spermicides would be 0.2%, about the same as that achieved by the combined pill (0.3%) and LNG-IUS (0.1%) during perfect use.⁵⁰

PROBABILITY OF FAILURE OVER TIME

Attention is confined solely to the first-year probabilities of pregnancy because probabilities for longer durations are generally not available. There are three main points to remember about the effectiveness of contraceptive methods over time. First, the risk of pregnancy during either perfect or typical use of a method should remain constant over time for an individual woman with a specific partner (providing that her underlying fecundity and frequency of intercourse do not change). Second, in contrast, the risk of pregnancy during typical use of a method will decline over time for a group of users, primarily because those users prone to fail do so early, leaving a pool of more diligent contraceptive users, those who are relatively infertile or who have lower coital frequency. This decline will be far less pronounced among users of those methods with little or no scope for imperfect use. The risk of pregnancy during perfect use for a group of users should also decline, but this decline will not be as pronounced as that during typical use, because only the relatively more fecund and those with higher coital frequency are selected out early. For these reasons, the probability of becoming pregnant during the first year of use of a contraceptive method will be higher than the probability of becoming pregnant during the second year of use. Third, probabilities of pregnancy cumulate over time. Suppose that 15%, 12% and 8% of women using a method experience a contraceptive failure during years 1, 2 and 3, respectively. The probability of not becoming pregnant within 3 years is calculated by multiplying the probabilities of not becoming pregnant for each of the 3 years: $0.85 \times 0.88 \times 0.92$, which equals 0.69. Thus, the percentage becoming pregnant within 3 years is 31% (i.e. $100\% - 69\%$).

The lesson here is that the differences among probabilities of pregnancy for various methods will increase over time. For example, suppose that the typical proportion of women becoming pregnant each year while taking the pill is 8% and while using the diaphragm is 16%. Within 5 years, 34% of pill users and 58% of diaphragm users will become pregnant.

FACTORS THAT INFLUENCE EFFICACY

The simple question 'Will it work?' is such a complicated issue because many factors influence contraceptive efficacy. Factors that affect contraceptive failure rates and probabilities reported in the literature can be usefully divided into three categories: (1) the inherent efficacy of the method when used correctly and consistently (perfect use) and the technical attributes of the method that facilitate or interfere with proper use; (2) characteristics of the user; and (3) competence and honesty of the investigator in planning and executing the study, and in analysing and reporting the results.

Inherent efficacy

For some methods, such as sterilization, implants, the copper-T IUD and the LNG-IUS, the inherent efficacy is so high, and proper and consistent use is so nearly guaranteed, that extremely low pregnancy rates are found in all studies, and the range of reported pregnancy rates is quite narrow. For other methods such as the pill and injectable, inherent efficacy is high, but there is still room for potential imperfect use (forgetting to take pills or failure to return on time for injections), so the second factor can contribute to a wider range of reported probabilities of pregnancy. In general, the studies of sterilization, injectable, implant, pill, patch, ring, IUD and IUS use have been very competently executed and

analysed. Studies of periodic abstinence, spermicides and the barrier methods display a wide range of reported probabilities of pregnancy because the potential for imperfect use is high, the inherent efficacy is relatively low, and the competence of the investigators is mixed.

User characteristics

Characteristics of the users can affect the pregnancy rate for any method under investigation, but the impact will be greatest when the pregnancy rates during typical use are highest, either because the method has less inherent efficacy or because it is hard to use consistently or correctly.

Imperfect use—The user characteristic that is probably most important is imperfect use of the method. Unfortunately, nearly all investigators who have attempted to calculate ‘method’ and ‘user’ failure rates have done so incorrectly. Investigators routinely separate the unintended pregnancies into two groups. By convention, pregnancies that occur during a month in which a method was used improperly are classified as user failures (even though, logically, a pregnancy may be due to failure of the method, if it was used correctly on some occasions and incorrectly on others), and all other pregnancies are classified as method failures. However, investigators do not separate the exposure (the denominator in the calculation of failure rates) into these two groups.

Since investigators do not generally inquire about perfect use except when a pregnancy occurs, the proper calculations cannot be performed. The importance of perfect use is demonstrated in the few studies where the requisite information on quality of use was collected. For example, in a World Health Organization study of the ovulation method, the proportion of women becoming pregnant among those who used the method perfectly during the first year was 3.1%, whereas the corresponding proportion failing during a year of imperfect use was 86.4%.¹⁴ In a large clinical trial of the cervical cap conducted in Los Angeles, among the 5% of the sample who used the method perfectly, the fraction failing during the first year was 6.1%. Among the remaining 95% of the sample who used the cap imperfectly on at least one occasion, the first-year probability of pregnancy was nearly twice as high (11.9%).⁵¹

Frequency of intercourse—Among those who use a method consistently and correctly (perfect users), the most important user characteristic that determines the risk of pregnancy is frequency of intercourse. For example, in a study in which users were randomly assigned to either the diaphragm or the sponge, diaphragm users who had intercourse four or more times a week became pregnant in the first year twice as frequently as those who had intercourse fewer than four times a week.⁵² In that clinical trial, among women who used the diaphragm at every act of intercourse, only 3.4% of those who had intercourse fewer than three times a week became pregnant in the first year, compared with 9.7% of those who had intercourse three or more times per week.¹⁵

Age—A woman’s biological capacity to conceive and bear a child declines with age. This decline is likely to be pronounced among those who are routinely exposed to sexually transmitted infections such as chlamydia and gonorrhoea. Among less-exposed women, the decline is likely to be moderate until a woman reaches her late thirties.⁵³ Although many investigators have found that contraceptive failure rates decline with age,^{54–57} this effect almost surely overstates the pure age effect because age in many studies primarily captures the effect of coital frequency, which declines both with age and with marital duration.⁵⁸ User characteristics such as race and income seem to be less important determinants of contraceptive failure.

Influence of the investigator

The competence and honesty of the investigator also affect the published results. The errors committed by investigators range from simple arithmetical mistakes to outright fraud.⁵⁹ One well-documented instance of fraud involved the Dalkon shield. In a two-page article published in the *American Journal of Obstetrics and Gynecology*, a first-year probability of pregnancy of 1.1% was presented and the claim made that 'only the combined type of oral contraceptive offers slightly greater protection'.⁶⁰ It was not revealed by the researcher that some women had been instructed to use spermicides as an adjunctive method to reduce the risk of pregnancy, nor that he was part-owner of the Dalkon Corporation. Furthermore, he never subsequently revealed (except to the A.H. Robins Company, which bought the shield from the Dalkon Corporation but did not reveal this information either) that as the original trial matured, the first-year probability of pregnancy more than doubled.⁶¹

The system of drug testing in the USA, which demands that the company wishing to market a drug be responsible for conducting studies to assess its efficacy and safety, provides incentives for the unscrupulous to present less-than-honest results. Some actions that are not deliberately dishonest are, nevertheless, not discouraged by the incentives in the present system. For example, a woman who becomes pregnant may be discarded from a clinical trial if the researcher decides that she did not fit the protocols after all. Or one can be less than vigilant in trying to contact patients lost to follow-up (LFU). The standard assumption made at the time of analysis is that women who are LFU experience unintended pregnancy at the same rate as those who are observed. This assumption is probably innocuous when the proportion LFU is small. However, in many studies, the proportion LFU may be 20% or higher, so what really happens to these women could drastically affect the estimate of the proportion becoming pregnant. The author's strong suspicion is that women LFU are more likely to experience a contraceptive failure than those still in the trial. For example, one study found that the pregnancy rate for calendar rhythm rose from 9.4 to 14.4 per 100 women-years of exposure as a result of resolution of cases LFU.⁶²

Methodological pitfalls

Several methodological pitfalls can snare investigators. One of the most common is a misleading measure of contraceptive failure called the Pearl index, which is obtained by dividing the number of unintended pregnancies by the number of years of exposure to the risk of unintended pregnancy contributed by all women in the study. This measure can be misleading when one wishes to compare pregnancy rates obtained from studies with different average amounts of exposure. The likelihood of pregnancy declines over time because those most likely to become pregnant do so at earlier durations of contraceptive use and exit from observation. Those still using after long durations are unlikely to become pregnant, so an investigator could (wittingly or unwittingly) drive the reported pregnancy rate towards zero by running the trial 'forever'. Two investigators using the NSFG obtained Pearl index pregnancy rates of 7.5 and 4.4 per 100 women-years of exposure for the condom.⁶³ One (rate of 4.4) allowed each woman to contribute a maximum of 5 years of exposure, while the other (rate of 7.5) allowed each woman to contribute only 1 year. Which investigator is incorrect? Neither. The two rates are simply not comparable. In contrast, life-table measures of contraceptive failure are easy to interpret and control for the distorting effects of varying durations of use.

Another problem occurs when deciding which pregnancies to count. Most studies only count the pregnancies observed and reported by the women. If, on the other hand, a pregnancy test were administered every month, the number of pregnancies (and hence the pregnancy rate) would increase because early fetal losses not observed by the women would be added to the number of observed pregnancies. Such routine pregnancy testing in the more recent

contraceptive trials has resulted in higher pregnancy rates than would otherwise have been obtained, and makes the results non-comparable with those from other trials. Other, more technical, errors that have biased reported results are discussed elsewhere.^{3,64}

The incentives to conduct research on contraceptive failure vary widely between methods. Many studies of the pill and IUD exist because companies wishing to market them must conduct clinical trials to demonstrate their efficacy. In contrast, few studies of withdrawal exist because there is no financial reward for investigating this method. Moreover, researchers face differing incentives to report unfavourable results. The vasectomy literature is filled with short articles by clinicians who have performed 500, 1000 or 1500 vasectomies. When they report pregnancies (curiously, pregnancy is seldom mentioned in discussions of vasectomy ‘failures’, which focus on the continued presence of sperm in the ejaculate), their pregnancy rates are invariably low. Surgeons with high pregnancy rates simply do not write articles calling attention to their poor surgical skills. Likewise, drug companies do not commonly publicize their failures. Even if investigators prepared reports describing failures, journal editors would not be likely to publish them.

SUMMARY

Male and female sterilization and the long-acting reversible contraceptives (the implant, injectable, IUD and IUS) that do not require adherence are the most effective methods for protecting against pregnancy, but they offer no protection against sexually transmitted infections. Hormonal methods requiring daily, weekly or monthly adherence are equally effective during typical use. Barrier methods are much less effective during typical use. Whether or not this differential is due to self-selection (those most determined to avoid pregnancy choose methods with higher inherent efficacy) is unknown.

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Practice points

- Most methods have a low risk of failure if they are used correctly and consistently. The most effective methods are those not requiring adherence.
- The most effective methods do not protect against sexually transmitted infections.
- Even a low annual risk of pregnancy implies a high cumulative risk of pregnancy during a lifetime of use. For example, an annual probability of pregnancy of 3% implies a 26% probability of pregnancy over 10 years.
- The most effective method for an individual woman or couple is a method that actually will be used correctly and consistently.
- Simultaneous use of two methods dramatically lowers the risk of failure
- Emergency contraception offers a last chance to prevent pregnancy after unprotected intercourse.

Research Agenda

- How can we improve our understanding of why men and women use contraceptives imperfectly, or not at all?
- What interventions would decrease misperceptions about contraceptive methods among users and providers?
- How can various forms of media be used to communicate about contraceptive effectiveness, including the difference between typical use and perfect use? What interventions would increase use of methods with low typical-use failure rates (long-acting reversible methods of contraception, such as intrauterine contraceptives and implants)?
- How can we gain a better understanding of why women do not use emergency contraception when they have unprotected intercourse but do not want to become pregnant?

Figure 1.
Comparing typical effectiveness of contraceptive methods

Table 1

Percentage of women experiencing an unintended pregnancy during the first year of typical use and the first year of perfect use of contraception, and the percentage continuing use at the end of the first year; USA.

Method (1)	Women experiencing an unintended pregnancy within the first year of use (%)		Women continuing use at 1 year (%) ³ (4)
	Typical use ¹ (2)	Perfect use ² (3)	
No method ⁴	85	85	
Spermicides ⁵	29	18	42
Withdrawal	27	4	43
Fertility-awareness-based methods	25		51
Standard Days method ⁶		5	
TwoDay method ⁶		4	
Ovulation method ⁶		3	
Sponge			
Parous women	32	20	46
Nulliparous women	16	9	57
Diaphragm ⁷	16	6	57
Condom ⁸			
Female	21	5	49
Male	15	2	53
Combined pill and progestin-only pill	8	0.3	68
Patch	8	0.3	68
Ring	8	0.3	68
3-month injectable	3	0.3	56
Intra-uterine devices			
Copper T	0.8	0.6	78
Levonorgestrel intra-uterine system	0.2	0.2	80
3-year implant	0.05	0.05	84
Female sterilization	0.5	0.5	100
Male sterilization	0.15	0.10	100

Emergency contraceptive pills: treatment initiated within 72 h after unprotected intercourse reduces the risk of pregnancy substantially.

Lactational amenorrhoea method is a highly effective, temporary method of contraception.⁹

Source: Trussell.³

¹ Among typical couples who initiate use of a method (not necessarily for the first time), the percentage who experience an accidental pregnancy during the first year if they do not stop use for any other reason.

² Among couples who initiate use of a method (not necessarily for the first time) and who use it perfectly (both consistently and correctly), the percentage who experience an accidental pregnancy during the first year if they do not stop use for any other reason.

³ Among couples attempting to avoid pregnancy, the percentage who continue to use a method for 1 year.

⁴ The percentages becoming pregnant in Columns (2) and (3) are based on data from populations where contraception is not used and from women who cease using contraception in order to become pregnant. Among such populations, about 89% become pregnant within 1 year. This estimate

was lowered slightly (to 85%) to represent the percentage who would become pregnant within 1 year among women now relying on reversible methods of contraception if they abandoned contraception altogether.

⁵Foams, creams, gels, vaginal suppositories and vaginal film.

⁶The Ovulation and TwoDay methods are based on evaluation of cervical mucus. The Standard Days method avoids intercourse on cycle days 8–19.

⁷With spermicidal cream or jelly.

⁸Without spermicides.

⁹However, to maintain effective protection against pregnancy, another method of contraception must be used as soon as menstruation resumes, the frequency or duration of breast feeds is reduced, bottle feeds are introduced, or the baby reaches 6 months of age.