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Family Planning Digest

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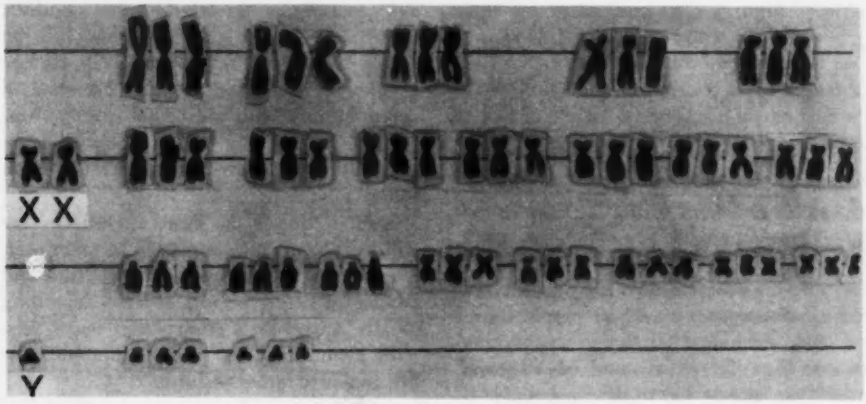
Fertility Society 1974

Experts Report on Pill and Fetus, Sperm Antibodies, Corpus Luteum, Sterilization



Fetal triploid chromosomes magnified 1,000 times. X and Y are sex chromosomes.

Experts on human fertility and infertility focused on several areas related to family planning at the thirtieth annual meeting of the American Fertility Society held in Hollywood, Florida, in April. One report delineated the minimal effects of previous oral contraceptive use on chromosome abnormalities in future pregnancies. The still unexplained significance of sperm antibodies in men who have had a vasectomy drew continued attention, while another report suggested a method of inducing immediate sterility following vasectomy. Other investigators discussed the problem of reversing tubal ligations, reporting that one surgical approach to reversal offered a better chance of success than other methods, although a live birth was achieved in only a minority of the cases. Also reported was basic research to identify the time period during which the corpus luteum, because of its production of progesterone, is necessary to maintain a pregnancy before the placenta has developed sufficiently to take over this function.

No Link Between Pill, Chromosome Damage

Women who have previously used oral contraceptives and then decide to have a child appear to be at no greater risk of having an abnormal infant than women who have never used the pill, Dr. Harold Klinger, professor of genetics at Albert Einstein College of Medicine, reported. In a series of chromosome analyses of about 1,100 newborn infants and fetuses from some 1,000 induced abortions, the incidence of chromosome abnormalities was virtually the same whether the mother had previously used oral contraceptives, other methods or no method.

Because these abnormalities are rare events — occurring in about one of 200 newborn infants — Dr. Klinger emphasized that the sample size was not large enough to rule out completely any effect of oral contraceptives in producing abnormal infants, although no indication of such an effect has thus far been seen. He told *Digest* that, while it is possible "safely" to conclude that there is "no five- or tenfold increase in chromosome abnormalities" attributable to prior pill use, not enough cases have been analyzed to rule out even a twofold increase.

There is some indication, however, that prior pill use may cause an extremely small increase in fetal loss early in the reproductive process. Two other series of chromosome analyses — one of spontaneous abortions, the other of eggs taken from women during laparotomy (usually for tubal ligation) — were also performed. In both series, there was a higher incidence of one particular chromosomal abnormality among women who had used oral contraceptives than among other women. But the difference was not statistically significant, Dr. Klinger explained, because of the small number of cases analyzed.

The abnormality is one in which the ovum fails to divide properly during cell division (meiosis) and thus remains with twice as many chromosomes as it should have. A normal human cell is diploid; that is, it possesses two sets of chromosomes, one from each parent. The germ cells, sperm and ova, are haploid, with only one set of chromosomes. When, as described above, meiosis is abnormal, the ovum remains diploid and, if it is fertilized by a normal sperm, the fetus is triploid (with three sets of chromosomes). There have been no reports of a triploid fetus ever surviving to term, however.

Of 79 ova from former pill users cultured in vitro, seven (8.9 percent) were diploid, and the rest were normal. Of 86 eggs from women who had never used oral contraceptives, two (2.3 percent) were diploid, while the rest were normal.

When the products of spontaneous abortions from 56 former pill users and 124 never-users were analyzed, the incidence of chromosome abnormalities other than triploidy was the same in the two groups. But there were three instances of triploidy among the former users and none among the never-users.

Even if further analysis shows that this suggested effect of oral contraceptives is actually present, its effect on reproductive wastage is minimal, Dr. Klinger observed. He and his colleagues estimate overall reproductive wastage at about 60 percent — with three-fifths of fertilized eggs not resulting in a term birth — although others have estimated wastage at as low as 20 percent. Using the frequency of triploidy in spontaneous abortions found in this series, "it turns out that the increase in reproductive wastage due to triploids would be something like .001 percent or less," the physician told *Digest*.

Since other investigators have suggested that there might be an excess of females among offspring of women who had previously used oral contraceptives, this factor was also analyzed.

When the induced abortions were studied, there was a slightly higher proportion of females among women who had formerly used the pill than among never-users, but this difference was not statistically significant. When some 2,400 newborn infants were studied, there was no difference in the sex ratio of children of former users and those of never-users. A further comparison showed that there was no difference in birth weight or length or in morbidity and mortality in the first day of life between infants of former users and those of never-users.

Antibodies Persist Following Vasectomy

The puzzling problems involving sperm antibodies, developed by a large proportion of vasectomized men after the operation, continue to draw the attention of investigators.

Dr. Rudi Ansbacher of the Department of Obstetrics and Gynecology of Brooke General Hospital at Fort Sam Houston in Texas, reported a continued decline in the number of men with sperm antibodies in a series of vasectomized men he has been studying for three years. [See: "Sperm Antibodies Remain Puzzling," *Digest*, Vol. 2, No. 4, 1973, p. 7.] Of the 18 men he is still following (of an original group of 48), seven (39 percent) had sperm-agglutinating antibodies (causing sperm to clump) 36 months postvasectomy, compared with eight at 24 months, nine at 18 months, eight at 12 months and seven at six months. None of the men had such antibodies in their blood serum before their vasectomy. Whether any further decline can be expected is unknown, Dr. Ansbacher noted, as are the reasons for the antibodies' appearance and disappearance.

The experience with sperm-immobilizing antibodies is somewhat different. At one year postvasectomy, one-third of the 18 men had developed these immobilizins, but by 18 months they were still present in only one man. While this man still had immobilizins present at his latest examination, Dr. Ansbacher observed, they were at a significantly lower level than previously noted.

Is Fertility Affected?

But the important question, according to Dr. Ansbacher, is to determine the relationship of these antibodies to fertility. "We have no data right now to correlate this," he told *Digest*. "If we can relate antibody presence with lack of fertility prior to reanastomosis, then why perform the reanastomosis if the man is still going to have antibodies?" He reported that in each of 10 men he studied who underwent reanastomosis, antibody titers rose after reanastomosis. (All had agglutinating antibodies and one had immobilizing antibodies.)

There may be some indications that the immobilizins are more important than the agglutinins in preventing fertility, however. In a study of couples seeking treatment for infertility which appeared in *Fertility and Sterility*, Dr. Ansbacher and his colleagues reported that four of eight men with only agglutinating antibodies fathered children, while none of five men with immobilizing antibodies had wives who conceived. He had previously reported that the presence of sperm-immobilizing antibodies in either husband or wife tended to promote poor or no penetration of cervical mucus by the spermatozoa.

Even if this is the case, agglutinins are still a problem: they appear to be more common after vasectomy than immobilizins, and persist for longer periods of time, according to Dr. Ansbacher's study. And many men with agglutinins and without immobilizins are unable to father children.

Antibodies and Autoimmune Disease

Since the presence of these antibodies indicates that the body is attacking a part of itself (the sperm), does their presence signal a breakdown of sorts in the body's immune system which could lead to autoimmune disease? The answer appears to be "no." Dr. Ansbacher reported finding no such disease in any of his patients. This was confirmed by Drs. Lawrence Dubin and Richard D. Amelar, and their colleague Cy Schoenfeld of the New York University School of Medicine, who studied a group of men with congenital bilateral absence of the vasa deferentia (four-fifths of whom had agglutinating antibodies), and also found no diseases in this category. Dr. Ansbacher noted that the autoimmune system may not recognize sperm as part of the body since the immune system develops during the prenatal and immediate postnatal period, while spermatogenesis does not begin until puberty.

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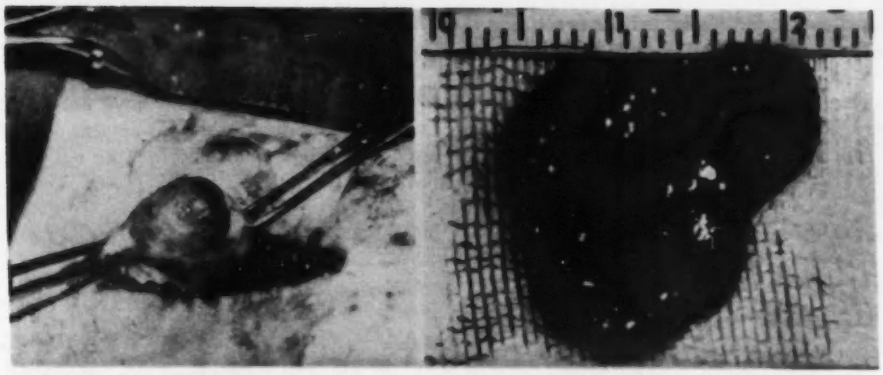

Excised human ovary (left) and corpus luteum (right) after luteectomy.

Timing of Luteo-Placental Shift May Lead To Development of New Contraceptive Method

Efforts to develop a postcoital contraceptive have concentrated on ways to interfere with the process of implantation. Normally, the corpus luteum, a yellowish body formed in the ovary, produces progesterone, the hormone which is essential to maintain an implanted blastocyst. Eventually, the placenta takes over this progesterone-producing function and the corpus luteum no longer plays an essential role in the reproductive process. Until recently, the precise timing of this "luteo-placental shift" was unknown and, therefore, efforts to interfere with luteal function were frustrated. A series of recent experiments performed by investigators associated with Washington University Medical School in St. Louis and Turku University Medical School in Finland suggests that destruction of the corpus luteum at less than four weeks after a missed menstrual period causes spontaneous rejection of the blastocyst. After that period, placental functioning takes over and luteolysis ceases to be of significance.

To pin down the timing, researchers headed by Dr. Arpad I. Csapo performed luteectomies (surgical removal of the corpus luteum) on 59 women in the very early stages of pregnancy who were undergoing tubal ligations for sterilization.

Seven luteectomized women received progesterone replacement therapy — 100 mg of progesterone twice a day. None aborted within seven days; all these pregnancies were then terminated by dilatation and curettage (D&C). Similarly, six women who underwent tubal ligation but not luteectomy also failed to abort in seven days following their operation, and the pregnancies were terminated by D&C. But when there was no major progesterone source to maintain the pregnancy, the outcome was different. All 21 women luteectomized less than four weeks beyond their missed menstrual period, and 18 of 20 luteectomized during the fourth week — and given no progesterone substitute — aborted spontaneously. By the fifth week of amenorrhea, however, the placenta appeared to be taking over progesterone production, as only two of 10 women luteectomized during this time period had spontaneous abortions. D&C was performed on those women with continuing pregnancies. (An additional luteectomized patient had a tubal pregnancy, which was surgically removed.)

"Evidently," Dr. Csapo noted, "gestational timing distinctly affected the clinical consequences of luteectomy." The luteo-placental shift "began during the second week and was far advanced during the fifth week after the first missed menstrual period." Measurements of plasma progesterone levels showed the relationship of abortion to progesterone withdrawal: In the 41 women who aborted, there was a rapid and sharp decline in plasma progesterone levels. In the luteectomized women who did not abort, there was a moderate decrease in plasma progesterone, which rose again beginning four days after luteectomy. There was only a minimal decrease in plasma progesterone among the control patients (tubal ligation but no luteectomy). A 75 percent decrease in plasma progesterone levels was required to initiate cyclic uterine contractions, Dr. Csapo noted, but a further 50 percent decrease was needed before abortion occurred.

"The gestational timing of the luteoplacental shift and the magnitude of the plasma progesterone levels sustained by the placenta fully explained the initial indispensability and the subsequent dispensability of the human corpus luteum," he said. "Apparently, the basic regulatory law is that . . . progesterone . . . is indispensable in normal pregnancy maintenance until near term, in laboratory animals as well as in the human. . . . Sustained progesterone deficiency (which does not terminate pregnancy) jeopardizes prenatal life and development, while a slightly greater progesterone deficiency which provokes premature delivery threatens the postnatal life and development of the underdeveloped newborn."

Tubal Reanastomosis Methods Evaluated

Attempts at reversing female surgical sterilization have met with generally poor results, if term birth is the criterion of a successful reversal. However, one surgical approach to reconstructing the fallopian tubes, of several different methods which have been tried, seems to have a somewhat greater success rate, although a distinct minority even of these attempts has resulted in term births, according to a report by Drs. Alvin M. Siegler and Romeo J. Perez of the State University of New York Downstate Medical Center.

In a review of 201 attempted surgical reversals, including 23 of their own cases over a 20-year period, as well as those reported in the medical literature, the physicians found the following:

- The surgical method called end-to-end reanastomosis, in which the obstructed segments of each tube are removed and the two patent (open) sections are joined, was used on 46 women. Eighteen pregnancies occurred and 14 (30 percent) resulted in live births. (There was also one tubal pregnancy; the outcome of three was unknown.)
- The most commonly used method, uterotubal implant, in which the longer portion of the severed tube is implanted into the uterus, resulting in a restored passageway, was employed on 124 women. Twenty-four pregnancies occurred, but only 16 (13 percent) resulted in live births. Of the remaining eight pregnancies, four ended in miscarriage, two were tubal, one ended in a premature delivery, and the outcome of one was unknown. (The surgical method used in 31 attempted reversals was either not known or combined various methods.)

"The percentage of term pregnancies was . . . twice as great following end-to-end anastomosis compared to uterotubal implantation," the authors observed, "yet the latter was performed in 60 percent of patients." They noted that none of these reversals involved women sterilized by the newer surgical methods, laparoscopy or hysteroscopy, in which the tubes are sealed by electrocoagulation, rather than cut and tied.

When a woman requests reversal of her tubal sterilization, the authors recommend "a complete infertility investigation in most instances to establish that tubal occlusion is the only cause for sterility. This plan is especially important if a new marriage has supervened and the interval of time between sterilization and attempted tuboplasty has been more than a year."

In addition, patients should be told that "chances for a living term infant are less than 40 percent . . ., delivery will probably be by cesarean section and a tubal gestation results in 10 to 15 percent of all pregnancies."

Immediate Sterility After Vasectomy?

Researchers attempting to develop a male contraceptive pill became interested in a group of chemicals known as nitrofurans some 20 years ago. These antibacterial agents are commonly used against urinary tract infections. It was observed that their systemic use caused a reduction in sperm production, but in experiments with rabbits the orally administered dose levels required for complete suppression of spermatogenesis were found to be highly toxic to the animals. Two urologists from New York Medical College have found, however, that injections of low, nontoxic doses of these drugs into the vasa deferentia of men following vasectomy can immobilize sperm and thus bring about immediate postoperative sterility.

Normally, men who have had a vasectomy are not considered sterile until two consecutive ejaculates show no live spermatozoa. This process of emptying the vasa of sperm can take from a few weeks to many months. But animal experiments and early human trials suggest that the nitrofurans can immobilize all sperm present, Drs. Peter S. Albert and Joseph E. Davis reported.

Two nitrofuran compounds — nitrofurantoin sodium and nitrofurazone — were evaluated in laboratory tests. Initially, various concentrations of the two compounds were incubated with freshly ejaculated human spermatozoa to determine their effect on sperm motility. Then, to evaluate toxicity, concentrations of these drugs three times greater than needed to prevent all sperm motility in vitro were used to flush the vasa of guinea pigs.

The experiments showed that the minimum concentration of nitrofurantoin sodium needed to immobilize sperm was 20 times greater than that needed of nitrofurazone to achieve the same results. In the toxicity studies, tissue was examined from the vasa of experimental animals sacrificed at intervals from one to 12 weeks after flushing with the nitrofurans. Both compounds were found to be "non-toxic to the vas deferens when used in concentrations up to three times greater than necessary for sperm immobilization." No evidence of inflammation or development of sperm granulomas was seen.

Nitrofurantoin sodium was then used as an intraoperative vas flush in 18 vasectomies in India, with the results available from six men. These men were all in their forties with from four to six children. When their initial ejaculates following vasectomy were examined, four men had no live sperm in their ejaculates, one man had two live sperm and one man had four live spermatozoa, all poorly motile, compared with a normal sperm count in the tens of millions.

Nitrofurazone had been used with six patients in Dr. Davis' private practice at the time the paper was presented. No live sperm were found in either of their first two post-vasectomy ejaculates.

While these preliminary results indicate that these compounds are "of value in attaining azoospermia immediately postoperatively," further trials are needed to determine accurately their effectiveness in humans, the investigators pointed out.

Sources

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R. Ansbacher, "The Significance of Sperm Antibodies in Vasectomized Men";

R. D. Amelar, L. Dubin and C. Schoenfeld, "Circulating Sperm-Agglutinating Antibodies in Azoospermic Patients with Congenital Bilateral Absence of the Vasa Deferentia";

A. I. Csapo, M. O. Pulkkinen and H. L. Kaihola, "The Regulatory Significance of the Human Corpus Luteum."

A. M. Siegler and R. J. Perez, "Reconstruction of Fallopian Tubes in Previously Sterilized Patients";

P. S. Albert and J. E. Davis, "The Nitrofurans Utilized as Spermicidal Agents and Their Application in the Field of Fertility and Sterility";

Other Sources

R. Ansbacher, "Bilateral Vas Ligation: Sperm Antibodies," *Contraception*, **9**:227, 1974; and personal communication.

R. Ansbacher, K. Keung-Yeung and S. J. Behrman, "Clinical Significance of Sperm Antibodies in Infertile Couples," *Fertility and Sterility*, **24**:305, 1973.

P. S. Albert, personal communication.

Orals

Pill Use Linked to Urinary Infections

Current oral contraceptive users have a slightly higher rate of urinary tract infections (bacteriuria) than nonusers or former users, according to a study of 12,076 middle-income women who were members of the Kaiser Foundation Health Plan. In addition, according to a report by Dr. M. Takahashi and D. B. Loveland in the *Journal of the American Medical Association*, the incidence of these infections appears to increase with increased estrogen content in the pill and is higher for women using sequential preparations than for those using combination oral contraceptives.

Urine specimens were taken and cultured from women aged 18-54 undergoing multiphasic health examinations. Pregnant and postpartum women, and those taking estrogens for reasons other than contraception, were excluded. Positive cultures (defined as more than 100,000 bacterial colonies per ml) were found in 505 women (4.2 percent). All of these women were asked to return for a second specimen analysis; there were 232 positive second cultures (1.9 percent of the total) and 185 negatives, with 88 subjects who did not return.

Oral contraceptive users had a 2.4 percent infection rate, while 1.8 percent of former users and 1.6 percent of never-users had infections confirmed by two positive cultures. The bacteriuria rates were calculated separately for each of eight age categories (ranging from under 20 years to 50 and over). In all eight groups, current oral contraceptive users had higher infection rates than never-users; while they had higher rates than former users in seven of the eight categories. The highest rates were for current users under age 20 or over age 50 (3.6 percent for both).

When the investigators looked at the types of organisms causing infections, they found that there were appreciable differences in the infection rates for only one organism, *Escherichia coli* (*E. coli*), which caused three-fourths of the infections. While 1.1 percent of never-users and 1.3 percent of former users had *E. coli* infections, this organism was found in 2.0 percent of the women currently using orals.

There was no clear difference in infection rates for different durations of use or for different progestogen dosage levels, but there were appreciable differences for different estrogen dosages. Among women taking combination oral contraceptives containing mestranol (the only estrogen used by women in this group at more than one dosage level), those taking 50 mcg a day had a 1.1 percent infection rate, those taking 60-80 mcg a day had a 2.3 percent infection rate, and those taking 100 mcg a day had a 2.5 percent infection rate. Women using sequential preparations (which contain higher estrogen doses) had a 4.2 percent rate, against 2.2 for women using combination pills. Women taking 50 mcg of ethinyl estradiol (another estrogen) daily had a 2.7 percent infection rate—two-and-a-half times that of women taking the same dose of mestranol.

The authors noted that there was no attempt to standardize the data according to the women's sexual activity (on the theory that a woman who has intercourse more frequently or with more partners may have a greater risk of developing an infection of the genitourinary tract). While women using the pill might be more active sexually than others, they observed, this would not explain the increased infection rate with increased estrogen dosage.

Source

M. Takahashi and D. B. Loveland, "Bacteriuria and Oral Contraceptives—Routine Health Examinations of 12,076 Middle-Class Women," *Journal of the American Medical Association*, **227**:762, 1974.

1970 NFS

Initiation of Contraceptive Use Affects Age at Marriage, Timing of First Birth

Does it make any difference in the life of women when they begin to use contraception? A special analysis of the 1970 National Fertility Study of the contraceptive practices of a national sample of married women under 45 years of age suggests that it does. Women who initiate contraception prior to their first pregnancy marry later, are less likely to have a premarital conception, have their first child later and are more likely to finish high school than women who do not contracept before their initial pregnancy. In addition, investigators Ronald Rindfuss of the University of Wisconsin and Charles F. Westoff of Princeton report in an article in *Demography*, the data indicate a trend over the past decade toward greater use of contraception by women before they have experienced a pregnancy.

Overall Findings

Of 1,331 women married five-nine years in 1970 who had experienced at least one pregnancy, 544 women (41 percent) had used contraception prior to their first pregnancy, were, on the average, 22.6 years old and married 25 months when their first pregnancy was resolved. The remainder of the women (those who had not used contraception before the initial pregnancy) had been married an average of 11 months and were 20.9 years old at the end of the pregnancy. When the contraceptive practices of the total group of 1,433 women were considered, including those who had never been pregnant, those who had used contraception before pregnancy were seven months older at marriage (20.7 years) than those who had not (20.1 years). In addition, only 11 percent of the prepregnancy users had a premarital conception or birth, compared with 29 percent of the nonusers.

There were some differences in the initiation of contraception between blacks and whites, but the patterns shown for the group as a whole were also present when blacks and whites were considered separately. Among the whites, the mean age at the end of a woman's first pregnancy was 22.8 years for users and 21.1 for nonusers; among blacks the mean age was 21.1 years for users and 19.2 for nonusers. White users had been married an average of 27 months at the end of their first pregnancy, and white nonusers 13 months; while black users had been married an average of two months, and black nonusers ended their first pregnancy an average of five months *before* marriage. Black users were slightly older than white users at marriage—21.0 compared with 20.6 years—while black nonusers were slightly younger than white nonusers — 19.6 compared with 20.1 years. More than half of the blacks (both users and nonusers) had experienced a premarital pregnancy.

Since women premaritally pregnant are younger, on the average, at time of marriage and first pregnancy than those not premaritally pregnant, the investigators analyzed the data separately for women whose first pregnancy began after marriage. Although the differences between users and nonusers were smaller than for the sample as a whole, those who began using contraception before their first pregnancy, even in this restricted group, married later and ended their first pregnancy later than those who did not. Principally because nonusers had a higher proportion of premarital pregnancies, users had a higher probability of finishing high school, the authors added.

Changes in Contraceptive Use

In recent years, women have tended more and more to use contraception before experiencing their first pregnancy. For women married before age 20, about one-third of those born between 1926 and 1945 used contraception prior to their first pregnancy. For those born between 1946 and 1950, the proportion rose to 39 percent, while for those born from 1951 to 1955, 42 percent were users. Women married between ages 20 and 24 also showed an increase in recent years in use of contraception before their first pregnancy. In each birth cohort, more of these women contracepted before pregnancy than did women married before age 20. For those born between 1926 and 1940, about 40 percent were users, compared with 57 percent of those born from 1941 to 1945 and 64 percent of those born from 1946 to 1950. Since the latter two birth cohorts for both groups (those married before age 20 and those married at ages 20-24) were married in the

Table 1. Percent distribution of ever-married women who used contraception before their first pregnancy, according to birth cohort* and age at marriage, by contraceptive method

Birth cohort	Pill	Foam	Diaphragm	Condom	Douche	Withdrawal	Rhythm	Other methods
Age at marriage <20								
1926-1930	0	0	19	16	52	3	5	5
1941-1945	18	5	5	17	33	1	8	14
1946-1950	57	8	2	5	18	1	5	4
1951-1955	65	6	1	4	15	1	5	4
Age at marriage 21-24								
1926-1930	0	0	35	24	22	2	6	11
1936-1940	10	4	28	15	18	2	10	11
1941-1945	58	9	3	8	7	1	8	6
1946-1950	71	6	3	6	7	1	3	2

*Certain cohorts have been omitted from the table because their contraceptive use patterns showed little change from the 1926-1930 cohort.

Note: Percents may not add to 100 because of rounding.

1960s, the authors conclude that "it was approximately in the mid-60's that increasing proportions of women began using contraception prior to their first pregnancy."

First Method Adopted

Recent birth cohorts have been relying increasingly on the pill rather than traditional contraceptives as their first contraceptive method, as shown in Table 1.

Using the pill as an initial contraceptive method is more common among whites than blacks, however. Of those married before age 20 and born between 1946 and 1955 (those having access to the pill as a first method), 63 percent of whites but only 19 percent of blacks who used contraception prior to their first pregnancy initially used the pill, while 54 percent of blacks and only 14 percent of whites used the douche. Similarly, among women married between ages 20 and 24 and born between 1941 and 1950, 67 percent of whites used the pill and five percent used the douche, while 26 percent of blacks used the pill and 43 percent douched. Among whites, there were some differences between Catholics and non-Catholics. Of those married before age 20, 59 percent of Catholics and 64 percent of non-Catholics initially used the pill, while 18 percent of Catholics and three percent of others used rhythm. Of those married between ages 20 and 24, 50 percent of Catholics and 71 percent of non-Catholics first used the pill, while 18 percent of Catholics and three percent of others used rhythm.

"The widespread adoption of the pill by both Catholics and non-Catholics dominates the picture in the most recent cohorts," the authors noted. "The trend among white Catholics provides further evidence that Catholics increasingly are not conforming to the official proscriptions of the church regarding birth control."

Source

R. Rindfuss and C. F. Westoff, "The Initiation of Contraception," *Demography*, **11**:75, 1974.

Orals

Follow-Up of Women in Original U.K. Study Confirms Pill's Thromboembolic Effect

Five years after the landmark study in Britain which documented the relationship between thromboembolism and the pill, a follow-up investigation by Mary A. Badaracco and Dr. Martin P. Vessey (one of the researchers who participated in the original study) of most of the women in that study appears to establish that women who develop venous thromboembolism while using the pill have less risk of a recurrence (after stopping pill use) than do women who never used oral contraceptives but who also developed thromboembolism. This finding, reported in the *British Medical Journal*, adds further support to the data linking the pill to abnormal blood clotting, and disputes the widely published assertion that women who developed thromboembolism while on the pill were predisposed to the condition, and the pill, at worst, hastened an otherwise likely event.

The original pill users, who later discontinued oral contraceptives, had only one-fourth as many repeat thromboembolic events in the years following the hospital admission for which they were included in the original study, as the group of women who never used the pill. This implies that the pill caused the original thromboembolism in many of the former users, otherwise repeat occurrences would have been equal in the two groups.

Methodology

The original study group consisted of 42 married women aged 16-40 hospitalized for deep vein thrombosis or pulmonary embolism between 1964 and 1967 who were not oral contraceptive users, and an equal number who had been using the pill within a month of the start of their illness (all of whom subsequently discontinued pill use). Of the total of 84 women, the investigators were able to locate 76 (90 percent) for their follow-up. The completed questionnaires contained data on obstetric and menstrual history, use of oral contraceptives and any recurrence of thromboembolism after the original hospital admission. Women who suffered a recurrence were asked the date it occurred, the hospital where treated, details of management and outcome and any illness or injury predisposing to the episode.

Four women began using the pill after the original hospital admission (two who had originally used the pill and two who were not originally pill users). But only one of these women had a recurrence of thromboembolism, and this repeat event occurred six years *before* starting pill use. Therefore, these women were included in the analysis.

The Findings

Fifteen pill discontinuers and 15 nonusers had been pregnant since the original hospital admission, with 24 pregnancies in each group. Three discontinuers and three nonusers reported a recurrence of thromboembolism during a pregnancy or the postpartum period.

Five who took pills before their original hospital admission and 19 nonusers experienced repeat thromboembolic incidents unrelated to pregnancy. After three years (from the time of the original hospital admission, excluding time for pregnancy), eight percent of the discontinuers and 36 percent of the nonusers reported repeat incidents; after six years, 14 percent of the discontinuers and 43 percent of the nonusers had a recurrence of thromboembolism—a statistically significant difference.

When women with a prior history of thromboembolism (*before* the incident for which they were originally hospitalized) were analyzed separately, the same pattern was apparent—two of 12 women who had discontinued oral contraceptives had repeat incidents, against nine of 17 in the nonuser group. Among the women without a prior history of thromboembolism, three of 30 former pill users had a recurrence, compared to 10 of 25 nonusers.

"As a result of these considerations," the investigators observe, "we conclude that women who develop venous thromboembolism while using oral contraceptives, and subsequently discontinue them, have a smaller risk of suffering a recurrence than women developing the disease in the absence of exposure to oral contraceptives. This situation does not seem to apply during pregnancy or the puerperium, though the data in the present study are too few to draw a firm conclusion on this point."

Sources

M. A. Badaracco and M. P. Vessey, "Recurrence of Venous Thromboembolic Disease and Use of Oral Contraceptives," *British Medical Journal*, **1**:215, 1974.

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Rifampicin

TB Drug Reduces Effectiveness of Pill

Rifampicin, a drug used in treating tuberculosis, causes a high incidence of menstrual disorders in women using oral contraceptives and appears to decrease the effectiveness of the pill, a German physician reported at the twenty-second International Tuberculosis Conference held in Tokyo last year. According to Dr. Dietrich Reimers and his colleagues at Lungenkrankenhaus Bethanien in Solingen-Aufderhöhe, West Germany, four of 88 women treated by himself and one patient of one of his colleagues taking both oral contraceptives and rifampicin became pregnant, and 62 of 88 women (70.5 percent) developed menstrual disorders. Another 26 patients using orals were treated for tuberculosis with streptomycin instead of rifampicin, and only one (3.8 percent) developed menstrual disorders; none became

pregnant. The rate of menstrual disorders of the streptomycin patients is similar to "the normal frequency [of menstrual disorders] observed with ovulation inhibitors," the investigators reported.

If menstrual alterations "were the only side effects produced in patients receiving combined rifampicin and oral contraceptives, then no great harm would have been done, particularly if patients were forewarned about such disorders," Dr. Reimers noted. But the five pregnancies observed in this small group "is an extremely high incidence for a single observer." He suggested that the manufacturers of oral contraceptives and rifampicin should include "appropriate warnings" in their package inserts.

Dr. Reimers suggested a possible cause for the decreased effectiveness of the pill in women using rifampicin. Rifampicin appears to one of a class of substances able to increase the liver's production of certain enzymes, especially those responsible for estrogen metabolism. If the estrogens in oral contraceptives are broken down rapidly enough, their antiovulatory effect could be diminished.

Source

D. Reimers, L. Nocke-Finck and H. Breuer, "Rifampicin Causes an Inferior Effectiveness of Oral Contraceptives by Influencing Oestrogen Excretion," paper presented at the twenty-second International Tuberculosis Conference, Tokyo, Japan, Sept. 27, 1973.

Neonatal Jaundice

Breastfeeding, Pill Increase Risk

Infants are more likely to show signs of neonatal jaundice during the first week of life if their mothers previously used oral contraceptives than if they had not, and if they are breast-fed rather than bottle-fed, according to a report in the *British Medical Journal*.

The investigators from The Queen's University of Belfast, led by Dr. J. B. McConnell, studied 182 infants at the city's Royal Maternity Hospital—50 breast-fed and 50 bottle-fed babies whose mothers had not used the pill, and 48 bottle-fed and 34 breast-fed infants whose mothers had used orals. Blood samples were taken when the children were three and five days old, and plasma bilirubin was measured. (An elevated level of this red bile pigment in the blood is a sign of jaundice).

On the third day, the bottle-fed infants of mothers who had not used the pill had significantly lower bilirubin readings than the other three groups, whose average bilirubin levels were almost identical. By the fifth day, the plasma bilirubin concentrations had dropped 32 percent in both bottle-fed groups, but only three percent in the breast-fed groups. Among the two bottle-fed groups, the infants of mothers who had never used oral contraceptives had significantly lower levels of bilirubin than the others. There was no statistical difference, however, between the two breast-fed groups (children of pill users and children of nonusers); bilirubin levels in both breast-fed groups were significantly higher than in the bottle-fed groups.

These findings, the authors noted, "suggest that breast-feeding and prior maternal use of the pill each have an icterogenic [jaundice-producing] effect in the newborn." The effect when both factors operate together is only "minimally greater" than when they operate alone, however.

The researchers also examined the effect of giving progestogens to the mother during her pregnancy in order to prevent miscarriage. Plasma bilirubin levels in the 16 infants of these mothers were, on the average, significantly higher than in any of the other four groups on both the third and the fifth days. This finding, they observed, is "perhaps more important from the point of view of clinical management" than the findings on pill use and breast feeding.

Source

J. B. McConnell, J.F.T. Glasgow and R. McNair, "Effect on Neonatal Jaundice of Oestrogens and Progestogens Taken Before and After Conception," *British Medical Journal*, **3**:605, 1973.

Credits

p. 1: H. Klinger; p. 3: A. I. Csapo; p. 5: A Heyman, Magnum; p. 7: K. Heyman; p. 8: United Nations; p. 9: *Ceres;* p. 11: the Upjohn Co.; p. 13: L. Freed, Magnum; p. 14: R. Crane, © Time, Inc.; p. 15: B. Uzzle, Magnum; p. 16; M. Stuart.

Minipill

Progestogen-Only Pill No Bar to Ectopics

Two recent letters in the *British Medical Journal* suggest that progestogen-only minipills may not protect a user against ectopic pregnancies. In two separate series of patients, the incidence rates of ectopic pregnancies were at the same or higher levels than that expected in a group of women using no contraception.

Dr. John Bonnar of John Radcliffe Hospital, Oxford, England, reported four ectopic gestations in a group of women participating in clinical trials of 0.35 mg of norethisterone daily, with a rate of two per 100 woman-years of use. The pregnancies occurred from four months to one year after the women began using the minipills. One common factor in the four pregnancies, the physician wrote, was "a delay in diagnosis of 7-14 days. . . . The fact that the patient was taking oral contraceptives was considered to militate against the diagnosis of ectopic pregnancy because the accepted side effects of progestogen-only contraception, spotting and breakthrough bleeding, lengthening of the cycle, and short periods of amenorrhea, are also symptoms of ectopic pregnancy."

Dr. D. F. Hawkins of Hammersmith Hospital, London, reported that three of 535 women he was treating had developed ectopic pregnancies—one using 0.5 mg of chlormadinone acetate daily, one using 0.35 mg of norethisterone, and one taking 0.5 mg of megestrol acetate in oil. For the three preparations, the ectopic pregnancy rates ranged from 0.6 to 1.2 per 100 woman-years of use, "directly comparable" with the general estimate of 0.8 to 1.2 ectopics per 100 woman-years for women not using contraception.

The physician observed that "there is little doubt that this procedure has the property of preventing intrauterine pregnancy but not preventing tubal pregnancy—a situation somewhat resembling that with intrauterine devices. . . . The patient taking progestogen-only oral contraceptives who presents with symptoms suggesting early pregnancy should be considered to have an increased risk of ectopic gestation."

Since the minipill does not prevent ectopic pregnancy, it is clear that its contraceptive action cannot be mediated, as has been claimed, by changes in the cervical mucus, the physician concluded.

Sources

J. Bonnar, "Progestogen-only Contraception and Tubal Pregnancies," *British Medical Journal*, **1**:287, 1974.

D. F. Hawkins, "Progestogen-only Contraception and Tubal Pregnancies," *British Medical Journal*, **1**:387, 1974.

Resources in Review

By Dorothy L. Millstone

Since 1974 has been designated by the United Nations as World Population Year (WPY), a flood of new, attractive and useful materials, produced by the UN's Fund for Population Activities and many other sources, has become available.

● The Fund's 1974 calendar is a handsome, information-packed treasure trove, timely for the half of the year that remains, and useful long after that for its colorful charts, dramatic pictures and demographic data.

For one free sample, write to United Nations Fund for Population Activities, 485 Lexington Ave., New York, N.Y. 10017. Copies will be sent in larger volume to institutions and agencies that indicate how they will employ them in population education.

● *World Population Year 1974,* another Fund product, is a kit containing a potpourri of materials relating to the observance. Included are: 10 issues of its "WPY Bulletin," a six-page, 5½" x 11", lively, well-designed newsletter reporting on items of interest in demography and family planning around the world; four booklets with brief statements by Rafael Salas, the Fund's Executive Director, on such subjects as women and WPY and Catholics and WPY; and miscellaneous flyers and booklets which might be useful in classroom teaching.

Free samples of the kit may be obtained from the above address.

● *World Population: Status Report 1974* (8½" x 11") is a Population Council contribution to WPY, published in the Council's *Reports on Population/Family Planning* series.

This 47-page global overview, lavishly illustrated with clear charts and maps, documents demographic change historically; defines modern population trends in their geographic and socioeconomic settings; and examines family planning programs from the point of view of their sponsorship, range and effectiveness and their impact on population dynamics.

Bernard Berelson, Council President, and staff members who collaborated in the preparation of this report, succeed in translating complicated technical and scientific demographic terminology into popular concepts and vocabulary without lowering the level of scholarship. For academicians as well as informed laymen, the report is the population/family planning library's equivalent to a top-notch medical manual for a doctor's bookshelf. Its definition of issues, its identification of current, and differing, positions on population growth, and its glossary are noteworthy. But there is much more. The 15 most heavily populated countries of the world are analyzed briefly, giving the reader quick access to basic facts and significant distinctions. Population Council and other research into family planning's impact on population change is summarized with salutary candor. For example, the report says: "At the moment, the field does not have the technical means to say beyond doubt how much effect a family planning program has had directly on the birth rate nor to say beyond doubt that a strong program has had no independent effect. This may not be a satisfactory position, but it is where the field now appears to be. . . . In certain favorable situations fertility declined in the 1960s by 10-17 points, from a starting point around 36-40, and family planning programs appear to have contributed measurably but not solely to the decline and to have expedited the going trend. . . ."

A free copy may be obtained by writing The Population Council, 245 Park Ave., New York, N.Y. 10017.

● *Finance and Development,* the quarterly publication of the International Monetary Fund and the World Bank Group, devoted more than half its December 1973 issue to population matters in celebration of WPY. The authors of the six population-related articles are all World Bank staff members, nationals of five countries, some of them less developed and some developed, and with diverse population problems. While much of the content will be familiar, its emanation from World Bank specialists may open the way to a new audience heretofore cool to the urgency of demographic and family planning education. The content of the articles includes a glossary, a look at population policy in developed countries and the role of the World Bank in addressing population and its impact on economic progress.

The artwork in this slick-paper, 8½" x 11", 48-page magazine is uncommonly attractive, and so is the fact that the publication is available in English, French or Spanish.

World Population Year symbol.

A free copy of the population issue may be obtained by writing to *Finance and Development,* International Monetary Fund Building, Washington, D.C. 20431.

● *Family Planning U.S.A.* (6" x 9", 31 pp., 1973) is a fast-reading, chart-illustrated account of the history, philosophy and practice of birth control against the background of U.S. population change.

Material covering contraceptive service, access, need, public and private funding, avenues of delivering services and major unresolved questions is presented, and a resource list is included. It is published by Planned Parenthood of Metropolitan Washington, D.C., in connection with WPY.

To obtain a copy, write Planned Parenthood Publications, 810 7th Ave., New York, N.Y. 10019. The price is 35¢; discounts for orders in quantity.

● Also U.S.-based is *Population and the American Future* by Elizabeth Ogg. The 1974 Public Affairs pamphlet (No. 503) is a condensation of the 1972 report of the Commission on Population Growth and the American Future. The bulk of this 5" x 7", 28-page booklet is faithfully abbreviated from the report, available in full from the U.S. Government Printing Office. It is conveniently packaged, easy to use, and costs only 35¢. This pamphlet may bring the findings of a balanced study to a wide audience.

Order from Public Affairs Pamphlets, 381 Park Ave. South, New York, N.Y. 10016. Discounts for orders in volume.

● *Population* is a 39-page, colorful, attractive booklet published in 1973 by the International Planned Parenthood Federation (IPPF).

Multicolor charts bring the statistics to life, and photos relieve the text's serious message which, though low-key and free of scare techniques, provides clear evidence of the dangers of continuing population growth.

Family planning is rarely mentioned and is not defined in the otherwise exemplary glossary. The treatment of this subject as well as the booklet's general objective approach are indicated in a paragraph on population growth and socioeconomic development, which comments:

> Reducing the population growth rate, that is, population planning, is not an end in itself and is not a substitute for promotion of development, but it is often an essential and necessary element in planning for economic growth and social progress. Furthermore, population policies, including family planning, will only be successful if promoted together with and reinforced by plans looking toward improvement in social and economic conditions.

This handy, informative, 6″ x 8″ booklet includes a brief (seven-item) reading list and a short introduction to IPPF and what it does; it could be a very useful junior and senior high school text in population education. Information on family planning can be incorporated easily.

The price of a single copy is 75¢. To order, write IPPF Western Hemisphere Region, Inc., 111 Fourth Ave., 8th Floor, New York, N.Y. 10003.

● Family planning and some demographic information are combined in another IPPF booklet, *Family Planning in Five Continents* (36 pp., 11¾″ x 8½″, 1973). This is a country-by-country report on population growth rates, family planning services and government policies toward them. Although written in clipped, almost telegraphic style, it affords a quick glance at world family planning and offers ready access to what nations are doing about curbing their growth rates.

The price of this booklet is $1. Order from IPPF at the address given above.

● *Population and Family Planning in Latin America* (1973), an 8¼″ x 9″, 35-page report of the Victor-Bostrom Fund, is an additional resource for WPY observances. While much of the content is demographic, there is an article on family planning in Mexico of more than passing interest. This includes excerpts from a statement by Luis Echeverria, President of Mexico, discussing Mexico's 3.5 percent growth rate and the new government policy supporting voluntary family planning. Included also are salient excerpts from the Pastoral Message on Responsible Parenthood issued by Mexican Catholic bishops in 1972. The statement describes the government plan as fully in keeping with the teaching of Vatican II and comments: "The most important decision for married people — to have or not to have more children — carries with it the right and responsibility on deciding on the means."

A free copy of Victor-Bostrom Fund Report No. 17 may be obtained by writing the Fund, attention Timothy X. Sullivan, 1835 K St., N.W., Washington, D.C. 20006.

● *Equilibrium* is a quarterly publication of the voluntary organization, Zero Population Growth, and Vol. 2, No. 1 (January 1974) is a bouncy special issue on population education designed for teachers and others working with young people. Of special interest is a teaching unit keyed to science or social science classrooms. This miniunit provides a base-line questionnaire to determine knowledge and attitudes before and after, and offers a diversified teaching method to establish the following concepts: world population growth takes place in a finite system; today's rapid growth rate is largely due to reductions in the death rate; U.S. population trends can be compared to world trends, despite differences; the growth ethic (more is better) needs to be questioned; and there are potential aids to a solution (steps to bring births and deaths in balance, changing roles for women).

"The growth of the human population" — cartoon from World Population Year issue of Ceres.

Good, reproducible charts and other visuals are provided along wtih suggested student-teacher activities. Family planning is excluded except in the final section on aids to a solution. Here, the fourth of five options is defined as "universal availability of effective contraceptives" and education about them.

For a free copy of *Equilibrium's* January issue, write to Zero Population Growth, 1346 Connecticut Ave., N.W., Washington, D.C. 20036. The April issue of the same publication (Vol. 2, No. 2) will be centered on issues related to WPY but this was not available for review as this column went to press.

Population Education Videotape

Especially for schools, but potentially of wider interest, is *Life World 2000*, a new series of 12 15-minute videotape population education programs made for junior and senior high schools by KETC-TV, Channel 9, in St. Louis.

Balance in interpretation and highly professional film technique are the hallmarks of these teaching units which will go into use in St. Louis schools this fall. A teaching guide, closely keyed to the program content, is part of the series, which is being offered for preview, purchase and use nationally.

An introductory overview unit highlights the importance of population matters to the individual and society and offers a glimpse of the 11 other programs. These have as themes: optimum population level, trends, migration, pollution, crowding and density, metropolitan areas and distribution, families and babies, zero growth, attitudes, population policies and alternative futures.

None deals with family planning as such. But the subject is mentioned in passing in one or two of the units. The series intentionally raises more questions than it answers, and stimulates independent thought by presenting at least two sides of most issues.

TV art techniques and color are used skillfully to hold viewer interest. Animation, slapstick, TV commercials, interviews with scientists, documentary sequences and dramatic and melodramatic combinations of sight and sound are interwoven.

Basic population literacy — understanding the terminology used in analyzing population change and its impact — is one end-product this program can yield.

Depending on the lesson that goes with it, students may also learn something about independent research and citizen responsibility.

Distribution is reserved for educational TV stations and school systems. The price for schools is $32 for each 15-minute segment and $1.40 per 10,000 students enrolled up to 250,000 enrollments; 50¢ per 10,000 above 250,000.

For preview purposes, a few segments can be seen without charge by making arrangements with the National Instructional Television Center. Those interested are advised to contact the most convenient regional office from among the following: Mr. Francis Thompson, Arlington Executive Building, 2009 N. 14th St., Arlington, Va. 22201; Mr. Larry Laswell, 333 Sandy Springs Circle, N.E., Atlanta, Ga. 30328; Mr. Chet Tomczyk, 10909 Bluemound Rd., Wauwatosa, Wis. 53226; and Mr. Gordon Hughan, 670 S. Bayshore Blvd., Suite 101, San Mateo, Calif. 94402.

Note — Readers are urged to send their own materials for review. Send two copies of each item; define the intended audience and goal; state the price and how *Digest* readers may obtain copies. Contributions should be addressed to:

Resources in Review
Family Planning Digest
Room 12A-33
5600 Fishers Lane
Rockville, Md. 20852

CDC Report

0.2% of Patients Under 21 in U.S.-Funded Family Planning Programs Sterilized in 1972

Following disclosure in the summer of 1973 that two young black women aged 14 and 12 had been sterilized after referral by a DHEW-funded family planning program in Alabama, a study was undertaken by DHEW's Center for Disease Control (CDC) to determine how many sterilizations of individuals under 21 had actually been performed using federal funds and whether such sterilizations of young people were on the increase. Data were available for the year 1972, primarily from the National Reporting System for Family Planning Services (NRSFPS), as well as from the Indian Health Service and the Federal Health Programs Service. A major shortcoming, according to Dr. Carl W. Tyler, Jr., director of CDC's Family Planning Evaluation Division, who directed the study, is that no data are available of sterilizations performed under Title XIX (Medicaid) or Title IV-A (AFDC) of the Social Security Act.

Several major findings emerged from the CDC study:

- A total of 1,204 persons under 21 years of age were reported sterilized in federally funded family planning programs in 1972. These represented about five percent of the 23,176 persons of all ages reported sterilized under these auspices, and 0.2 percent of persons under age 21 reported to have received *any* services from federally funded family planning programs. (An additional 19 persons under age 20 were reported sterilized by the Indian Health Service and two by the Federal Health Programs Service.)
- The overwhelming majority (95 percent) of those under 21 reported as sterilized were women, as were more than 99 percent of patients reported to have received *any* service in federally supported family planning programs in each age category. The 1,148 women under 21 who were sterilized represent just 0.07 percent of all women reported to have received any service under these auspices, and about seven percent of all women reported to have been sterilized in federally funded family planning programs.
- Sterilizations of persons under age 21 were concentrated at the older ages: Twenty-six percent were to persons aged 19 and 44 percent were to persons aged 20. Just 2.6 percent (a total of 30 procedures) were to persons aged 15 or younger. There were no data to indicate what proportion of these older teens might already have borne all the children they wanted or the proportion of the procedures to the younger teenagers which were performed for medical reasons or because of mental retardation.
- More than half (55 percent) of the women under 21 who were sterilized were black; 39 percent were white. (The remainder were reported as "other" or "unknown.") This compares to two-thirds (65.5 percent) of those who were reported to have received *any* service who were white, and three in 10 (29.4 percent) who were black. Another study of sterilization in family planning projects by Denton Vaughan and Gerald Sparer indicated, however, that for all age groups, including those 19 and younger, when standardized for parity, the proportion of blacks sterilized is lower than in the total family planning caseload. Dr. Tyler noted, however, that the parity data were incomplete, with women of unknown parity included in the zero-parity group. [See: "White Women in Federally Funded Programs Had Higher Sterilization Rates Than Blacks," *Digest*, Vol. 3, No. 2, 1974, p. 4.]
- More than three-quarters of all sterilizations of women under 21 were reported from six southern and southwestern states and Puerto Rico. The comparatively few sterilizations of males under age 21 were concentrated in five southwestern and western states.
- For nearly two out of five (38 percent) of those sterilized before age 21, it was reported that they or a family member received public assistance or were registered for Medicaid. This is a higher proportion of such patients than the 18 percent reported for the family planning program as a whole. (The Vaughan-Sparer study indicated that, when standardized for parity, this two-to-one ratio disappeared except for the zero-parity group, and sterilization rates were actually higher among those not receiving welfare at parity three or greater.)
- No trend was indicated of either an increase or decrease in sterilizations of persons under 21 in the course of the year.

Definitions and Methods

Data on sterilizations from NRSFPS were used only for individuals served in family planning projects receiving federal funds. Thus, of 924 projects which submitted reports in 1972, 73 were not included. Persons were assumed to have undergone sterilization in a federally funded program if sterilization was reported as the contraceptive method used at the end of any visit during 1972. Thus, Dr. Tyler pointed out, the definition of sterilization used "represents the prevalence (rather than the incidence) of sterilization" as reported by NRSFPS. He noted that if sterilization were defined as the medical service provided (another option on the NRSFPS form) rather than the contraceptive method used at the end of the visit, only two-thirds as many individuals under 21 would have been recorded as sterilized in 1972.

Detailed Findings

Nearly seven in 10 (67.8 percent) of the 1,148 young women sterilized were aged 19 and 20, while the rest were under 19. In all, 16 (1.4 percent) were sterilized before they were 15 years old, including two who were 10 and 11 years old, two who were 12, and 10 who were 13 years of age.

Of the 56 males under 21 sterilized, 51 were 19 and 20 years old, three were 18, one was 17 and one was 15; none was younger than 15.

More than half the women sterilized were black, compared with 39 percent who were white. The rate of black women sterilized was three times higher than that of whites. The picture was dramatically different for males: Some 91 percent of the 56 who were sterilized were white compared with fewer than four percent who were black.

The six states which, with Puerto Rico, accounted for more than three-fourths of all reported sterilizations to women under 21 were: Texas, Florida, Georgia, North Carolina, Tennessee and Alabama. The five states responsible for all the reported sterilizations to males under 21 were: Arizona and California (which, together, accounted for 43 percent of the reported male sterilizations), Missouri, Oklahoma and Texas. Commenting on the regional nature of the sterilization of minors, Dr. Tyler wrote: "The absence of cases from populous states with vigorous family planning programs such as Maryland, South Carolina and Oregon [may indicate] . . . that the NRSFPS did not, in all likelihood, provide comprehensive coverage of all Federally funded family planning projects that year." He also said there might be "underreporting or misreporting."

The data were analyzed to determine whether sterilization rates were influenced by the welfare status of family planning program recipients. Dr. Tyler noted that persons under 21 who reported that they or a family member received public assistance or was registered for Medicaid had almost three times the sterilization rate of those who did not so report. Thus, 4.3 per 1,000 of all program patients under 21 reporting such public assistance were sterilized compared with 1.5 per 1,000 not reporting assistance. For blacks, the respective rates were 5.1 and 2.7, and for whites, 2.9 and 1.1.

Looking at family planning counseling services reported in the NRSFPS, Dr. Tyler said that, with the exception of females younger than 15, counseling services were provided at increasing rates with increasing age. Individuals reporting public assistance or Medicaid for themselves or a family member were counseled for sterilization about

twice as frequently as those who did not so report. Whites and blacks received counseling with the same frequency, regardless of welfare status.

Women were also referred for sterilization more frequently with increasing age, again with the exception of 15-year-olds. Whites and blacks were referred with the same frequency. The referral rate for those reporting public assistance or Medicaid is twice that of those not reporting assistance. The data suggest, according to Dr. Tyler, that girls under age 15 referred or counseled for sterilization, or sterilized under the program, "appear to be an unusual group and may well represent those persons sterilized for mental inadequacy." He noted that the data, however, were not available to verify this hypothesis.

Reports from the two other sources of information on sterilization of minors showed that 19 Indian women under age 20 were sterilized: one was 12 years of age, 11 were aged 19. Seven were sterilized because of medical reasons, four for mental retardation. No Indian males were sterilized. Two young women, both 19 years of age and married, one white, the other black, and both with children, were sterilized in facilities administered by the Federal Health Programs Service.

Dr. Tyler pointed to what he described as "serious" limitations of the available data: NRSFPS may not have included comprehensive coverage of all federally funded projects in 1972; there may have been misreporting from some states; age was the only variable used to define minority status. (The physician noted that marital status, which might permit a minor legally to provide consent for medical care in some states, was not collected by NRSFPS in a way that could be used "satisfactorily" for the report.) There was also no way, he said, to indicate the extent to which sterilizations were influenced by family size, or which were medically indicated although, Dr. Tyler maintains, "almost certainly some of the 1,204 persons sterilized before their 21st birthday underwent this surgical procedure because it was an essential part of their medical treatment."

Guidelines

On March 15, Federal Judge Gerhard A. Gesell ruled that federal funds may not be used to sterilize minors and mentally incompetent adults, and the judge permanently enjoined DHEW from providing funds for such purposes. The moratorium remains in effect pending DHEW's decision on whether or not to appeal the ruling.

On April 18, DHEW issued new guidelines relating to provision of voluntary sterilization for competent adults. The guidelines mandate that "voluntary consent" be obtained from those seeking sterilization, and detail that the following elements be included in the definition of such consent:

- a "fair explanation" of the procedures;
- a description of the attendant discomforts and risks;
- a description of the benefits to be expected;
- an explanation concerning "appropriate alternative methods of family planning and the effect and impact of the proposed sterilization, including the fact that it must be considered to be an irreversible procedure";
- instruction to the patient that the individual "is free to withhold or withdraw his or her consent . . . at any time prior to the sterilization without prejudicing . . . future care and without loss of other project or program benefits to which the patient might otherwise be entitled."

Consent must be obtained in writing, and must include the statement that the details of informed consent have been presented orally. The document must be signed by the patient and an "auditor-witness" designated by the patient. Each consent document must include the following statement "printed prominently" at the top:

> Notice: Your decision at any time not to be sterilized will not result in the withdrawal or withholding of any benefits provided by programs or projects.

In addition, 72 hours must elapse between the time consent has been obtained and the performance of the sterilization. The number and nature of the sterilizations must be reported annually to the Secretary of DHEW.

Sources

C. W. Tyler, Jr., "The Sterilization of Minors and Others Legally Incapable of Consenting: A Review of Current Information," Dec. 28, 1973 (mimeo).

Relf, et al. v. *Weinberger, et al.*, Civil Action No. 73-1557; and *National Welfare Rights Organization* v. *Weinberger, et al.*, Civil Action No. 74-243, U.S. District Court, Washington, D.C., March 15, 1974.

Department of Health, Education and Welfare, "Restrictions Applicable to Sterilization Procedures in Federally Assisted Family Planning Projects," *Federal Register*. **39**:13872, 1974.

For Abortion Only

FDA Approves Prostaglandin Use

The first prostaglandin for use in midtrimester abortion in the United States—Upjohn's Prostin F2 alpha—has been approved by the Food and Drug Administration (FDA). The same drug was approved for use in Britain in September 1972. Various prostaglandins, principally $PGF_{2\alpha}$ and PGE_2, have been undergoing clinical trials as abortifacients in the United States and in several other countries. [See: "New Techniques Sought to Reduce High Complication Rate Linked to Late Abortion," *Digest*, Vol. 3, No. 1, 1974, p. 4.] The FDA specified that Prostin be administered only by the intraamniotic route.

Purified crystals of prostaglandin.

The side effects reported in trials with the drug have been a moderately high rate of incomplete abortions and frequent vomiting and diarrhea. The FDA-approved package insert for Prostin F2 alpha, taking note of these side effects, points out that the drug "is capable of stimulating the smooth muscle of the gastro-intestinal tract in man" and complications of this sort are "not uncommon." In addition, the insert refers to one clinic trial with 229 women in which there was a 12.2 percent rate of incomplete abortions. Warning that some animal studies suggest that certain prostaglandins "may have some teratogenic potential" [causing defects in an embryo], the insert urges that "any failed pregnancy termination with Prostin F2 alpha should be completed by some other means."

The insert also noted that when the abortifacient is used in combination with oxytocin (a labor-inducing substance) in women who are pregnant for the first time, "adequate cervical dilation is needed." Several cases of cervical perforation occurred because of the effect of strong uterine contractions (caused by $PGF_{2\alpha}$ and oxytocin) on the inadequately dilated cervix.

One of the less common complications of Prostin F2 alpha noted in the package insert is convulsions. Australian researchers reported recently in *The Lancet* that five of 320 patients who underwent midtrimester abortions with $PGF_{2\alpha}$ "experienced major convulsions during the procedure." One of them had a history of epileptic seizures but had experienced none for two years, and another was undergoing treatment for seizures and had experienced a major convulsion two weeks before her abortion. The other three had no prior individual or family history of epilepsy. The patient undergoing treatment for seizures had three convulsions from seven to 30 hours after prostaglandin instillation. In the other women, convulsions occurred from 12 to 25 hours after instillation, and from 11 hours before to one hour after abortion.

Of the total group of 320, seven women had a history of epilepsy. Two of the seven experienced convulsions during prostaglandin abortion. Upjohn, in its Prostin F2 alpha package insert, notes that the abortifacient should be "used with caution" in women with a history of epilepsy (among other conditions).

The Australian investigators also conducted electroencephalographic (EEG) studies of eight women prior to and after administration of $PGF_{2\alpha}$. Seven of the women exhibited normal brain wave patterns before prostaglandin instillation. The mild abnormality shown by the eighth woman was worse in EEGs taken one and four hours after the prostaglandin was administered. Three women showed no change. In one woman, abnormalities appeared in both postinstillation EEGs; in two women, abnormalities were seen in the first EEG but not the second; and in one patient abnormal changes were seen only in the second EEG.

The investigators noted that in experiments with dogs and monkeys, $PGF_{2\alpha}$ produced constriction of cerebral blood vessels, thereby reducing blood flow to the brain. "If these vascular changes occur in man," they observed, "they may be responsible for the epileptic seizures and EEG changes following intraamniotic administration of $PGF_{2\alpha}$."

Investigators at the University of Oxford, commenting on the observations of the Australian group, noted that in 615 abortions they had performed using $PGF_{2\alpha}$ none of the patients had a convulsion during the procedure, although there were seven epileptics in the group. One received prostaglandin intraamniotically, the others extraamniotically. The Oxford researchers noted that "further study is obviously necessary, particularly in relation to the different routes of administration and type of prostaglandins used, and this should include abortion induced by hypertonic saline."

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Census Data

Fertility Decline More Rapid among U.S. Minorities than among Urban Whites

The continuous decline in fertility in the United States since 1957, while affecting all segments of the population, is most pronounced in those groups which have had the highest fertility—blacks, rural whites, American Indians and Mexican Americans —according to a special analysis of 1960 and 1970 Census data by James A. Sweet of the Center for Demography and Ecology at the University of Wisconsin. These minority groups experienced a greater decline in fertility during the 1960s than did urban whites, the group with the lowest fertility in 1960, Sweet reported at the annual meeting of the American Association for the Advancement of Science in San Francisco. Generally, the most rapid decline in fertility has been in third and higher order births, suggesting a "heavy concentration" of completed fertility at the two-child family. The number of children under three years old in a household was used as the measure of fertility, and only the children of married women younger than 40 were included in the study. The period 1957-1960 was compared with 1967-1970. (The current decline in fertility began in 1958.)

Decline among Ethnic Groups

Married, urban white women had an average of .529 children under three years of age in 1960 compared with .398 children in 1970—a decline of 24.8 percent (see Table 1). Among married white women living in rural areas, the decline was sharper —from .581 children in 1960 to .393 in 1970, or 32.4 percent.

The fertility of all married black women declined from .656 children in 1960 to .436 in 1970, or 33.6 percent. Blacks, from the urban and rural South and from outside the South, experienced a greater decline than did urban whites during the 1960s.

Sweet points out that in the period 1957-1960, all three groups of blacks had a fertility level that was "substantially higher" than that of urban whites. For predominantly urban blacks living outside the South, the fertility level was 13 percent greater than that for urban whites; while the fertility level for urban southern blacks and rural southern blacks was 22 and 52 percent greater, respectively, than the urban white levels. By 1967-1970, however, the picture had changed: the nonsouthern black level was only four percent greater than of urban whites; the southern urban black level was nine percent greater than that of urban whites; and the southern rural black fertility level was 29 percent greater.

Sharp fertility declines were experienced by three other ethnic groups, Sweet found. American Indians, who started the period with the highest fertility of all the groups, showed a decline of 42.1 percent, that of Japanese Americans declined by 30.3 percent and that of Mexican Americans by 28.8 percent. Chinese Americans, whose fertility was closest to urban whites in 1960, showed declines similar to urban whites. Those of Puerto Rican descent were the only group whose fertility fell significantly less than that of urban whites (17.8 percent).

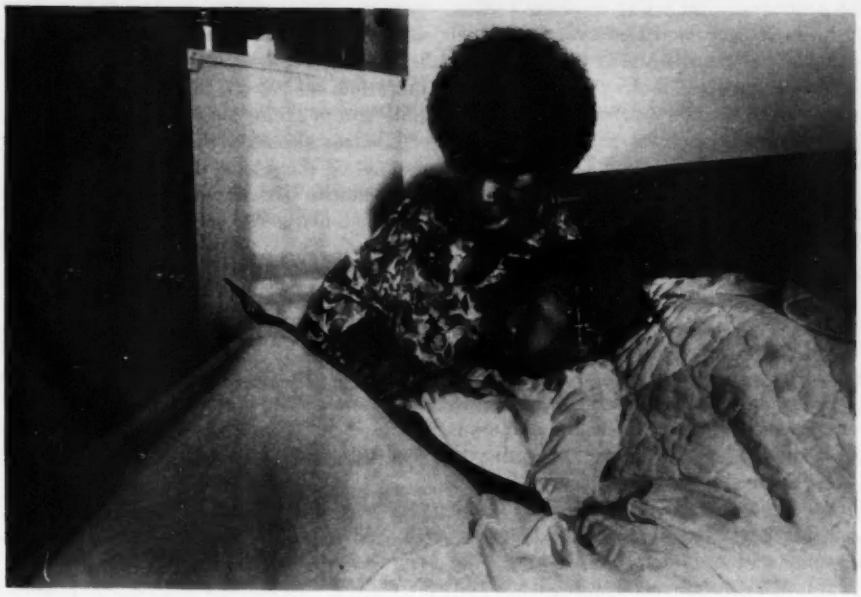
Effect of Education

Among urban whites, the greatest change generally was shown by those groups which had the highest fertility. For example, the relatively few urban white women with less than five years of schooling (the highest fertility group in 1960) experienced a 36.4

Table 1. Mean number of children younger than three years of age (fertility level) in households of married women, percent decline and relative fertility levels (compared to urban whites); by ethnic group, 1960 and 1970

Group	Children < three years of age				
	Number 1960	Number 1970	Percent decline 1960-1970	Relative level 1960	Relative level 1970
Whites					
Urban	.529	.398	24.8	1.00	1.00
Rural	.581	.393	32.4	1.10	0.99
Blacks					
Urban South	.644	.433	32.8	1.22	1.09
Rural South	.803	.515	35.9	1.52	1.29
Non-South	.598	.414	30.8	1.13	1.04
Others					
American Indian	.881	.510	42.1	1.67	1.28
Japanese American	.553	.385	30.4	1.05	0.97
Chinese American	.550	.425	22.7	1.04	1.07
Puerto Rican American*	.634	.521	17.8	1.20	1.31
Mexican American*	.798	.568	28.8	1.51	1.43

*In 1960, defined as first or second generation in the United States; in 1970, defined as persons who indicated they were of Mexican or Puerto Rican descent.



percent decline in fertility, while women with from five to eight years of schooling (who had the lowest fertility levels in 1960) had the lowest decline in fertility for any educational group, 18.9 percent.

When the fertility declines were analyzed by husband's income, the decline was greatest "among couples with relatively low income," falling by more than 35 percent for those with incomes of less than $3,000 a year (in 1960 dollars) compared with about 20 percent for those with incomes of over $4,000 a year. Fertility decline occurred in all regions of the country, Sweet observed, "but was somewhat more rapid in the West and somewhat less rapid than average in the Northeastern states."

An examination of parity showed that the fertility decline during the decade under study was concentrated in the higher order births. Fourth and higher order births declined by about 50 percent and third order births by 25 percent, while second order births fell by only 10 percent and first births by 21 percent. "Thus, what seems to be happening is a very rapid decline in high order births and a substantial decline even in third order births," Sweet noted, "suggesting a substantial reduction in completed fertility and a heavy concentration of completed fertility at two-child families. The 21 percent decline in births of first order during this period suggests probably that couples are postponing first births to a much greater extent in 1970 than they were a decade before." He noted that an additional decline in first order births was caused by an increase in average age at marriage.

The overall fertility decline and the various differentials within it have several implications, Sweet observed. The decline in fertility among those with the lowest incomes should have an "effect on measured poverty. In the absence of any income change, a decline in fertility has the effect of reducing the degree of measured poverty since a given family's poverty status is a function both of its income and of the composition of the family." A related factor is the possibility that "a smaller share of American children, and perhaps a substantially smaller share, will be growing up in impoverished settings with large numbers of siblings present in the family. If this is the case, whatever long-term impact on life chances made by poverty and large numbers of siblings should be substantially diminished."

Lower fertility will have an effect on the educational system, he added. With smaller numbers to serve, "the educational system, without any increase in aggregate real expenditure, has the opportunity of making a rather substantial increase in investment per child." In addition, the reduction in family size and the trend towards postponing first births will remove some of the constraints to working from young married women. This "should have the effect of creating a situation in which couples will accumulate durable consumer goods earlier in their marriages, and it might well have the effect of producing more demand for owned housing as opposed to rental housing among young married couples. In addition, the poverty population may be reduced not only by the effect of smaller [family] size . . . , but also by the increased ability of wives to enter the work force and make a contribution to family income."

Source

J. A. Sweet, "Differentials in the Rate of Fertility Decline: 1960-1970," paper presented at the annual meeting of the American Association for the Advancement of Science, San Francisco, Calif., Feb. 26, 1974.

Abortion

Risk Increases With Gestational Age

A comparison of various abortion methods at different stages of pregnancy confirms earlier reports that morbidity increases continuously with gestational age, David A. Edelman, a statistician with the International Fertility Research Program of the Carolina Population Center, reported at the annual meeting of the American Public Health Association. [See: "Mortality, Morbidity in Legal Abortion Drop as Women Learn Early Procedures Safer," *Digest*, Vol. 2, No. 3, 1973, p. 8.] The study was based on data from 614 women undergoing endometrial aspiration (or 'menstrual induction', a very early abortion procedure using a 4-6 mm plastic cannula, in which the cervix is not dilated) at five clinics in three countries, plus 4,463 vacuum aspiration or dilatation and curettage abortions at 20 hospitals in nine countries. Among the findings were the following:

- Endometrial aspiration, performed from four to six weeks beyond the start of the last menstrual period (LMP), had the lowest complication rate (1.3 percent) of any procedure at any stage of gestation. [For more details on endometrial aspiration see: "Menstrual Induction Experience Reported," *Digest*, Vol. 2, No. 4, 1973, p. 13.] Endometrial aspiration is the only method used at this gestational age.
- Vacuum aspiration, in which a larger cannula is used, the cervix is dilated, and curettage is occasionally employed to check for retained products of conception, performed at seven or eight weeks LMP, had the second lowest complication rate—3.9 percent—but this was three times higher than for endometrial aspiration at four-six weeks.
- Complications from dilatation and curettage (D&C) also were lowest at seven-eight weeks LMP—5.1 percent—but higher than for vacuum aspiration performed at the same gestational age. From nine to 12 weeks' gestation, however, the complication rates for D&C were marginally lower than for vacuum aspiration (at nine to 10 weeks, 8.1 percent for vacuum aspiration and 6.8 percent for D&C, and at 11-12 weeks, 9.6 percent for vacuum aspiration and 6.2 percent for D&C).

Beyond 12 weeks, the rate for vacuum aspiration was nearly two times higher (25.4 percent) than for D&C (13.0 percent). Vacuum aspiration is rarely used at this stage of gestation in the United States. The morbidity rate for D&C, although markedly greater than for earlier gestational ages, was lower than that for intraamniotic saline instillation reported by the Joint Program for the Study of Abortion (ranging from 29.5 percent of women at 14 weeks' gestation to 21.0 percent at 19-20 weeks' gestation). [See:

"New Techniques Sought to Reduce High Complication Rate Linked to Late Abortion," *Digest*, Vol. 3, No. 1, 1974, p. 4.] Thus, D&C at 13-14 weeks LMP "appears safer than waiting until 16 weeks' gestation in order to administer intraamniotic saline," the traditional approach, Edelman said.

D&C was associated with the lowest failure rate (defined for D&C and vacuum aspiration as operations requiring a second procedure, and for endometrial aspiration as continuing pregnancies) of any of the procedures, 1.3 percent of 1,814 cases, compared with 4.5 percent of 2,498 cases for vacuum aspiration and 1.7 percent for endometrial aspiration. Since the latter is performed before a pregnancy test is completely reliable, only 55 percent of the patients were confirmed pregnant. The failure rate was therefore based on the confirmed pregnancies, rather than on the total sample. More of the endometrial aspiration patients were lost to follow-up (9.6 percent) than patients undergoing the other procedures, however (5.7 percent for vacuum aspiration and 2.0 percent for D&C).

Endometrial aspiration patients were generally younger and of lower parity and were more likely to be unmarried than women undergoing vacuum aspiration and D&C. In addition, all endometrial aspiration procedures were done on an outpatient basis, while 18.2 percent of vacuum aspiration patients were hospitalized at least overnight, as were 23.1 percent of D&C patients. Most endometrial aspiration patients were high school graduates, while nearly three-fourths of D&C patients had not completed seventh grade.

Major complications were low in the endometrial aspiration group. There were no reports of uterine perforation, cervical injury, blood loss greater than 100 ml, anesthesia complications or fever greater than 100.4°F (38°C) 24 hours postabortion. The rates for pelvic infection (0.5 percent) and prolonged bleeding (0.8 percent) were much lower than for vacuum aspiration (2.5 percent and 1.8 percent, respectively) and D&C (1.5 percent and 2.4 percent, respectively). In this series, the endometrial aspiration patients were 26-42 days LMP.

These major complication rates also increased with gestational age. While the rate of uterine injury was only 0.3 percent for vacuum aspiration and 0.9 percent for D&C at seven-eight weeks' gestation, and 1.5 percent for both at nine to 12 weeks, the rates rose to 7.1 percent for vacuum aspiration and 2.2 percent for D&C at 13 weeks and beyond. Similarly, blood loss greater than 100 ml was observed in 0.6 percent of vacuum aspiration cases and 0.9 percent of D&C cases at seven-eight weeks LMP; this rose to 2.2 percent of women undergoing vacuum aspiration and 1.3 percent of women having D&C at nine-twelve weeks, and increased to 15.7 percent for vacuum aspiration and 3.6 percent for D&C at 13 weeks and after. Failure rates also increased with gestational age. D&C failure climbed from 0.6 percent at seven-eight weeks to 4.7 percent at 13-14 weeks, while vacuum aspiration failure rose from 1.6 percent at seven-eight weeks to 9.6 percent at 11-12 weeks and 17.7 percent at 13-14 weeks.

"Although delaying the abortion from the first trimester to the second trimester exposes women to an increased risk of complications," Edelman noted, "this study indicates that any delay is associated with an increased rate of complication. Thus, to keep abortion morbidity to a minimum, women should be encouraged to seek pregnancy counseling as early as possible. Also, physicians and hospitals should have coordinated programs to [avoid] any unnecessary delays." Even within the two-week period during which menstrual regulation is performed, the overall complication rate rose with increasing gestational age, Edelman told *Digest*. For women 32-35 days LMP, the rate was less than one per 100 women, rising to slightly more than one per 100 for women 36-39 days LMP and to 2.5 for women 40-45 days LMP.

Edelman also noted the need for " a better method of diagnosing [early] pregnancy" to minimize the number of nonpregnant women undergoing endometrial aspiration.

Sources

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Adolescent Sexuality

Three-Fourths of Teenage First Pregnancies Are Premaritally Conceived, Study Finds

Three in 10 teenage girls who had premarital intercourse experienced a premarital pregnancy; and three-quarters of all first pregnancies to teenagers were conceived before marriage, according to an analysis of data from a 1971 study of adolescent sexuality, contraception and pregnancy by Melvin Zelnik and John F. Kantner of The Johns Hopkins University. "To marry and then to conceive is the exception among teenagers," the authors conclude, ". . . despite the fact that pregnancy is generally considered much more acceptable in a nuptial than in a nonmarital context." Since about 30 percent of teenage girls studied had premarital sexual experience, there were a total of nine percent of all teenagers to whom premarital pregnancies occurred. Based on 1971 population figures, this means that, of 2.6 million girls with sexual experience, 1.1 million became pregnant as teenagers, and 831,000 had premarital first pregnancies.

Pregnant high school student in California. Nine percent of teenagers have premarital pregnancies.

Two-thirds of the teenagers who had premarital first pregnancies did not marry before their pregnancy concluded; 55 percent did not marry before *or* after the pregnancy outcome. Eighty-four percent of black and 37 percent of white teenagers never had married as of the time of the study.

Excluding those who were pregnant at the time of the survey, more than two-thirds of those who did not marry before the conclusion of the pregnancy had a live birth; about one-fifth had an induced abortion. Blacks were much more likely to have a live birth and much less likely to have an abortion than whites. Eighty-five percent of blacks had a live birth, compared to 49 percent of whites; and six percent of blacks had an abortion, compared to 42 percent of whites.

The vast majority of premarital first pregnancies were not intended at the time of conception. Only one-fifth of those who did not marry before the pregnancy outcome reported that they wanted to conceive when they did. Even among those who married, fewer than half said that the premarital pregnancy was intended. Nevertheless, among those who became premaritally pregnant, only 13-16 percent used any method of contraception to prevent pregnancy. Those who did use a method "frequently [used] ineffective means of contraception such as withdrawal and douche," the authors reported.

About 45 percent of all births to teenagers resulting from first pregnancies were illegitimate. Of these babies born out of wedlock, almost nine out of 10 (86 percent) were living with their mothers at the time of the survey. White teenagers were much more likely than blacks, however, to give their babies up for adoption (18 percent compared with two percent). About one-fifth of those who had such an illegitimate birth subsequently married—11 percent of blacks and 41 percent of whites. Most married the putative father of the child; but about 40 percent married someone else.

Three-quarters of premarital first pregnancies to teenagers who married before the pregnancy concluded resulted in a live birth. No induced abortions were reported for this group. About half the girls said that they did not intend the pregnancy, but just 16 percent used contraception to avert it—not much better a record than among those who did not marry.

Among those who first conceived subsequent to marriage, 72 percent intended the pregnancy; 27 percent did not. "This is about the same amount of reproductive error reported by older married women" in the 1970 National Fertility Study, the investigators observed. However, only about one-fifth of the women who did not intend to become pregnant among this group used any method of contraception to prevent it. More than three-fourths of all live births resulting from first conceptions were conceived premaritally—95 percent in the case of blacks, and two-thirds of whites. Forty-five percent of such births occurred before marriage—86 percent of such births to blacks, and 23 percent of those to whites.

Fifty-six percent of all legitimate live births to teenagers resulting from first conceptions were conceived prior to marriage, with little difference between blacks and whites.

Source

M. Zelnik and J. F. Kantner, "The Resolution of Teenage First Pregnancies," *Family Planning Perspectives*, **6**:74, 1974.

Never-Married Teens
2.2 Million Need Subsidized Services

Between 1.4 and 2.3 million never-married 15-19-year-old girls in this country are at risk of an unintended pregnancy and therefore are in need of contraceptive services, according to estimates made by Leo Morris of the Family Planning Evaluation Branch of DHEW's Center for Disease Control. From 70,500 to 109,400 teenagers received services from private physicians, leaving a maximum of about 2.2 million in need of contraceptive services from organized family planning programs. Of these, only about 460,000 actually received services from such programs in FY 1972, or from one-fifth to one-third of those needing organized services among this group. "Clearly, there is a significant gap between estimated need for and utilization of family planning services among never-married teenagers in the United States," Morris declared.

Similar Estimates

He pointed out that his maximum estimate of teenage need of 2.2 million is "strikingly close" to that previously published by Joy G. Dryfoos of the Center for Family Planning Program Development using different methods and definitions, reinforcing "an upper limit of at least two million women in the never-married 15-19-year-old age group who are in need of organized services."

Morris based his estimates on data from the Johns Hopkins study of adolescent sexuality, contraception and pregnancy, directed by Melvin Zelnik and John F. Kantner, as well as on recent census data. Morris' minimum estimate is calculated from the number of teenagers who reported that they had intercourse in the month preceding the survey. The maximum estimate is derived from the number who said that they had ever had intercourse.

The Hopkins data, based on a 1971 national probability survey of U.S. teenagers,

provides information on sexual activity, contraceptive usage and source of contraception at each age level. Morris excludes from the need group those who are not sexually active, or who are sexually active but pregnant or seeking a pregnancy, and those who are married.

Morris said he did not use income as a criterion in estimating need for services among teenagers because teenagers face significant noneconomic barriers to obtaining contraception regardless of family income level.

He noted that while unwed 15-19-year-olds in 1969 accounted for less than five percent of total births, they accounted for more than eight percent of all unintended births in the United States. While 10 percent of all births in the country were illegitimate in that year, 29 percent of births to girls 19 or younger were out of wedlock, he added. In addition, studies have shown that in the mid-1960s an estimated 42 percent of legitimate births to teenage girls were premaritally conceived.

Morris observed that when services for teenagers are available, "teenagers appear willing to use facilities responsive to their needs. . . ."

Source

L. Morris, "Estimating the Potential Need for Family Planning Services among Young Unwed Females," paper presented at the annual meeting of the National Family Planning Forum, Washington, D.C., April 30, 1973 and revised for *Family Planning Perspectives*, **6**:91, 1974.

Family Planning Digest

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Cu-7

First Copper IUD Approved by FDA

The Food and Drug Administration (FDA) has approved the first copper-bearing IUD for general clinical use in the United States. The Cu-7, which has been available in several European countries under the name of Gravigard for more than a year, is manufactured by G. D. Searle and Company. It consists of 89 mg of copper wire, with 200 square mm of surface area, wound around the stem of a plastic device in the shape of a seven. Two early reports indicated that the Cu-7 had a pregnancy rate of slightly more than one per 100 woman-years of use and was effective for both parous and nulliparous women. [See: "Shield Pregnancies Higher than Loop's; TCu, Cu-7 Reviewed," *Digest*, Vol. 2, No. 1, 1973, p. 6.] The data presented by the Cu-7's manufacturer and included in the package insert are similar, with a pregnancy rate just under one per 100 woman-years for 12 months of use for both parous and nulliparous, with expulsion and removal rates somewhat higher for nulliparous women. One year continuation rates were given as 83.5 for parous women and 77.5 for nulliparae.

Still awaiting FDA approval is the TCu-200, a T-shaped device with the same amount of copper as the Cu-7, being investigated by The Population Council.

A method of reducing expulsions and removals of IUDs for bleeding and pain has been suggested by two Finnish researchers working with the Copper T. Careful insertion of the Copper T to ensure proper positioning in the uterine fundus (the portion of the uterus furthest from the cervix) markedly increases the continuation rate with the device, according to the investigators. The continuation rate after 12 months of use among 2,689 women who received the T-shaped polymer device with 200 square mm of copper wire wound around the stem (TCu-200) was 89.2 per 100 women, Drs. Henri Timonen and Tapani Luukkainen of Helsinki reported in *Contraception*.

While pregnancy and medical removal rates in this series were only marginally lower than those reported in other trials, the net cumulative expulsion rate of 2.2 per 100 women was significantly lower. This compares with 8.7 per 100 parous women (excluding early postpartum insertions) and 11.5 for nulliparous women in a Population Council study of data from 27 clinics. [See: "Copper IUD Protects the Never-Pregnant," *Digest*, Vol. 3, No. 1, 1974, p. 11.]

Most of the insertions in the Finnish study were made by physicians in their private offices, although 754 insertions—about 3 in 10—were made in a large family planning clinic. Written instructions to the doctors emphasized "strict asepsis," fundal positioning, and placing the IUD in the inserter immediately before insertion so that the plastic does not lose its "memory" of its proper shape. Follow-up visits were also emphasized, and scheduled at three, six and 12 months.

All insertions were made on the last day of menstruation or immediately after menstruation. About one-half the women were under 30, with 14 percent under 25. One-third of the women were of parity one, two-fifths of parity two, one-fifth of parity three or more, and seven percent nulliparous.

The pregnancy rate at 12 months decreased with increasing parity: from 3.3 for nulliparae (higher than the 1.3 rate in The Population Council study) to 0.9 for women of parity four or higher, or 1.6 overall. Expulsion rates were lowest in women over age 40 (0.6) and in those of parity four or more (0.0). Removals for pain or bleeding generally declined with increasing age and parity, as did removals for planned pregnancies.

The lowest continuation rate was for nulliparae—77.7 per 100 women—which is close to the 73.3 rate reported in The Population Council study. The highest continuation rates were for women of parity four or more (96.3) and for those over age 40 (92.9). Continuation rates did not vary significantly according to whether the women had previously had induced abortions; however, the pregnancy rate and the rate of infection rose slightly with increasing abortions. The continuation rate was slightly higher (91.0) and the expulsion rate slightly lower (1.5) among the clinic patients.

Sources

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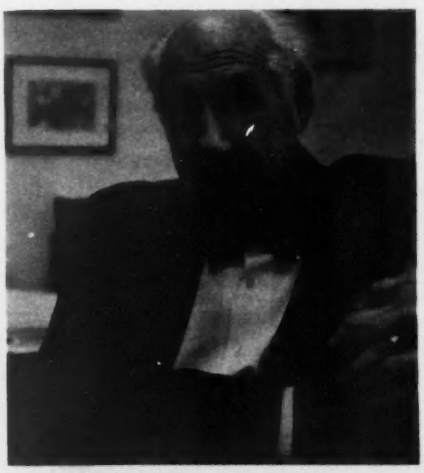
G. D. Searle and Co., package insert for the Cu-7 intrauterine copper contraceptive, 1974.



Alan F. Guttmacher, 1898-1974

"He was a teacher, a scholar, a man who led others to think broadly about social change. He knew many of the world's great and received his share of honors. . . . He was a man whose very being made a difference."
Louis M. Hellman

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