

## Clinical Diagnosis of Cervical Infection Is Less Accurate Than Lab Testing, But Leads to Higher Treatment Rate

Although the use of clinical signs and symptoms is less likely than laboratory testing to identify women with cervical infections, it leads to treatment of more infected women because treatment can be provided immediately.<sup>1</sup> According to a study of female sex workers attending a clinic in Cotonou, Benin, researchers relying on clinical assessment correctly identified and treated 48% of women with gonococcal or chlamydial cervical infection. In contrast, use of locally available laboratory tests led to the correct identification of 75% of women with these infections. However, not all infected women returned to the clinic for their laboratory test results; consequently, only 29% of them received treatment in the laboratory-based approach.

To compare the performance of clinic- and laboratory-based methods of diagnosing and treating gonococcal or chlamydial cervical infection, researchers recruited 481 female sex workers attending a sexually transmitted infection (STI) clinic in Cotonou between November 1997 and October 1999. A physician administered a structured questionnaire to obtain demographic data, as well as information on the participants' sexual behavior and condom use. Participants then received HIV pretest counseling, education on STIs, and a gynecologic examination that included abdominal and pelvic palpation. The physician also took a venous blood sample for HIV testing and three cervical swabs, two of which were sent to a local laboratory to screen for *Neisseria gonorrhoeae* by culture and for *Chlamydia trachomatis* by enzyme immunoassay; a laboratory at the Institute of Tropical Medicine in Antwerp, Belgium, assayed the third sample for these two organisms using polymerase chain reaction (PCR) analysis, which was used as the "gold standard."

A clinical diagnosis of cervical infection was made if a woman had one or more of the following signs: mucopus, or yellow discharge or blood on a swab of endocervical secretions; cervical tenderness or lower abdominal pain on palpation (an indication of pelvic inflammatory disease); or cellular evidence of in-

flammation on a vaginal swab. Cases of cervical infection identified in this way were treated immediately according to national guidelines, and all women were asked to return within 10 days for laboratory test results and treatment, if needed.

As an alternative, the researchers devised a summary measure based on the duration of prostitution, the number of clients per working day, the presence of vaginal discharge, and any cervical sign of infection; scores above a specified cutoff value indicated a cervical infection. The performances of the two diagnostic methods and that of the summary measure were then evaluated against the PCR results.

The mean age of the participants was 29; 30% were younger than 25, 48% were aged 25–34 and the remainder were 35 or older. Roughly four in five were temporary immigrants from nearby African countries; one in five were from Benin. On average, the women reported 2.7 years of prostitution, during which they had seen four clients a day. About 14% reported no condom use in the previous week, whereas 40% said that they had used a condom with all clients. Roughly one-half were using antibiotics daily for STI prevention.

According to the PCR results, one in four participants had a gonococcal or chlamydial infection; four in 10 tested positive for HIV. Of the 118 women with cervical infections, 86% had gonorrhea and 21% had a chlamydial infection. Multivariate logistic regression showed that these infections were associated with having been a sex worker for less than two years, having at least four clients a day, observation of vaginal discharge during the gynecologic examination, any sign of cervical infection, cellular evidence of inflammation and HIV infection (odds ratios, 1.8–2.6).

Compared with PCR testing, use of clinical signs and symptoms correctly identified 48% of women who had a gonococcal or chlamydial infection and 75% of those who were not infected. Furthermore, only 38% of participants who had received a diagnosis of cervical infection based on clinical assessment actually had a cervical infection, and 82% of those

with negative clinical results were actually disease free. When vaginal discharge was also included as a clinical sign of cervical infection, the accuracy of a positive clinical diagnosis rose to 66%, but the accuracy of negative findings dropped to 59%.

Compared with clinical assessment, the summary measure based on clinical and behavioral information correctly identified a higher proportion of infected women (64%) but a lower proportion of uninfected women (68%). The performance of the summary measure was not improved by including pelvic inflammatory disease or cellular evidence of inflammation.

The local laboratory tests were more accurate than either clinical diagnosis or the summary measure: They correctly identified 75% and nearly 100% of individuals with and without cervical infection, respectively. In addition, nearly all participants who had been identified as being infected on the basis of results from the local laboratory tests actually had a cervical infection (98%), and the majority of those with negative laboratory results were, in fact, disease free (92%).

Because women with a cervical infection had to return to the clinic within 10 days for their laboratory test results, the investigators assessed the usefulness of laboratory testing in this context by calculating the proportion of infected women who returned and received treatment within this period. Of the 118 infected women, 50 came back to the clinic, of whom 16 had been treated at their first visit on the basis of clinical assessment. Therefore, only 34 women who had positive results from the laboratory tests were treated (29%). However, clinical assessment and laboratory screening together resulted in treatment of 62% of infected women within 10 days.

The researchers comment that although laboratory analysis was more accurate in detecting infection than clinic-based screening, the practical difficulties and cost of laboratory testing in developing countries limit the usefulness of this method. Furthermore, after considering the follow-up rate among female sex workers, the analysts conclude that clinical assessment

was superior to the local laboratory tests. The use of clinical signs and symptoms, they add, “still remains very useful and should be applied in these populations, even when valid laboratory tests are available.” Alternatively, despite the likelihood of overtreatment, they suggest that “when [female sex workers] from a high-prevalence setting attend STI clinical services for the first time, presumptive treatment of cervical infection could be considered.” —*T. Lane*

#### REFERENCE

I. Mukenge-Tshibaka L et al., Syndromic versus laboratory-based diagnosis of cervical infections among female sex workers in Benin: implications of nonattendance for return visits, *Sexually Transmitted Diseases*, 2002, 29(6):324–330.

## Breast Cancer Risk Is Reduced by 4% for Each Year of Breastfeeding

For every 12 months that a woman breastfeeds, her risk of breast cancer declines by 4%, according to an analysis of 47 epidemiologic studies in 30 countries; this reduction is essentially the same in developing and developed countries, and for women with different background characteristics and reproductive histories.<sup>1</sup> In addition, breast cancer risk is reduced by 7% for every birth a woman has. The incidence of breast cancer is much lower in developing than in developed countries, and findings from this analysis suggest that the larger families and patterns of prolonged breastfeeding typical in the developing world explain much of the difference.

To study the relationship between reproductive factors and breast cancer risk, the analysts combined data from cohort and case-control studies involving a total of more than 50,000 women with breast cancer and nearly 97,000 cancer-free controls. Women with breast cancer were, on average, 50 years old when they received their diagnosis. These women had had fewer births than controls (2.2 vs. 2.6), and a larger proportion of them had never given birth (16% vs. 14%).

To calculate the relative risks of breast cancer associated with breastfeeding, the analysts limited the sample to women who had given birth, and they stratified the data by study, specific study site, and women’s parity, age at diagnosis, age at first birth and menopausal status. Among women who had given birth, those with cancer were less likely than controls to

have breastfed (71% vs. 79%) and reported a shorter average lifetime duration of breastfeeding (9.8 vs. 15.6 months).

For both cases and controls, as lifetime duration of breastfeeding increased, mean parity and mean number of children breastfed increased, and age at first birth decreased. To assess the risk of breast cancer associated with reproductive factors in the absence of breastfeeding, the analysts examined data on women who had never breastfed; among this group, they found that the relative risk of breast cancer declined by 3% for each one-year decrease in a woman’s age at first birth and by 7% for each birth she had. When they compared the effects of parity for women who had breastfed and those who had not, the risk of breast cancer declined as the number of births increased for both groups, but at each parity, women who had never breastfed had a slightly higher relative risk than those who had ever breastfed.

Comparisons of women who had never breastfed with those who had breastfed for varying durations revealed that the relative risk of breast cancer was 0.9 for women who had breastfed for 7–18 months and fell to 0.7 for those who had breastfed for 55 months or more. The reduction in relative risk was 4% for every 12 months of breastfeeding over a woman’s lifetime, and this result was the same irrespective of a woman’s parity, age at first birth or at diagnosis, ethnicity, level of education, family history of breast cancer, age at menarche, height, weight, body mass index, history of hormonal contraceptive use, menopausal status, or alcohol or tobacco use. The same reduction also was seen for both women in the developing world and their counterparts in developed countries.

Citing findings from other research, the analysts observe that around 1990, women living in developed countries had a considerably higher cumulative incidence of breast cancer until age 70 than those in developing countries. Given that women in the developed world also had fewer births and breastfed for shorter durations, the analysts explored the contribution of these factors to the incidence of breast cancer. By applying the relative risks from their study to age-specific incidence rates typical for developed countries around 1990, they estimated that if each woman in the developed world had 6.5 births instead of 2.5 and breastfed each child for 24 months rather than three months, the incidence of breast cancer by age 70 would be reduced by more than half (from 6.3 to 2.7 cases per 100 women). They further

estimated that breastfeeding would be responsible for almost two-thirds of this reduction.

As the analysts acknowledge, it is “unrealistic” to expect that the incidence of breast cancer will be substantially lowered by women’s adopting patterns of childbearing and breastfeeding that were typical in much of the world until about a century ago. However, they suggest that understanding how breastfeeding protects against breast cancer may make it possible to prevent the disease “by mimicking the effect of breastfeeding therapeutically or in some other way.” They conclude that “in the meantime, important reductions in breast-cancer incidence could be achieved if women considered breastfeeding each child for longer than they do now.”—*D. Hollander*

#### REFERENCE

I. Collaborative Group on Hormonal Factors in Breast Cancer, Breast cancer and breastfeeding: collaborative reanalysis of individual data from 47 epidemiological studies in 30 countries, including 50,302 women with breast cancer and 96,973 women without the disease, *Lancet*, 2002, 360(9328):187–195.

## For Chinese Men, Education Increases STI Stigmatization But Not Delay of Treatment

Among men with sexually transmitted infections (STIs) being treated at clinics in Hefei, China, eight in 10 felt stigmatized because of their infection and three in 10 had had STI symptoms for more than a week before seeking medical attention.<sup>1</sup> Men who had attended college and those with greater knowledge about HIV and other STIs were more likely than others to feel stigmatized (odds ratios, 2.8–3.4). Those who had herpes (HSV), syphilis, or a urethral discharge not caused by gonorrhea or chlamydia had elevated odds of delaying treatment (5.7–6.1), while those with a university education and those who had had premarital or extramarital sex in the past three months had decreased odds of waiting to seek medical care (0.2–0.5).

To determine the factors associated with feelings of stigmatization, delay of treatment and sexual behavior among men with STIs, researchers surveyed male patients at four urban STI clinics in Hefei, a city in eastern China, between May and July 2000. Men who reported having STI symptoms (i.e., urethral discharge, dysuria or genital ulcers) and were seeking

treatment for the first time for their current symptoms were eligible to take part in the study. Trained interviewers administered an initial questionnaire asking men about their social and demographic information, HIV and STI knowledge (rated on a 16-point scale) and medical history. Participants completed a second questionnaire on sexual behaviors, which was self-administered using a tape player. All men were examined by a physician, who took fluid samples to test for gonorrhea, chlamydia, HSV and syphilis.

Men who requested confidentiality from the STI clinic staff, preferred to go to the clinic at night or were afraid to be seen at the clinic were classified as feeling stigmatized. Those who had waited a week or more after the onset of STI symptoms to seek medical care were classified as having delayed treatment.

A total of 406 men with STI symptoms were interviewed. Twenty-three percent were aged 18–25, 28% 26–30 and the remainder 31–83. Two-thirds had had 6–10 years of education and 16% had attended college; nearly seven in 10 were married. The majority (86%) of men reported having urethral discharge or painful urination, with the remainder complaining of genital ulcers (14%). Among the participants with urethral discharge, 46% had gonorrhea, 8% chlamydia, 16% both and 29% other infections. Of men with genital ulcers, 22% tested positive for syphilis and 29% for herpes; 49% had other infections. Overall, 40% of men reported having sex after the onset of STI symptoms.

The great majority of men (80%) felt stigmatized because of their STI. Participants who had attended college and those who had the highest HIV and STI knowledge scores were significantly more likely than other men to feel stigmatized (odds ratios, 2.8–3.4). Twenty-eight percent of men had had symptoms for more than a week before seeking treatment; 17% had waited more than two weeks. In multivariate analyses, men who had urethral discharge not caused by gonorrhea or chlamydia and those with HSV or syphilis were more likely to delay seeking treatment than were those with both gonorrhea and chlamydia (5.7–6.1); having a university education and having had premarital or extramarital sex in the previous three months were associated with decreased odds of waiting to seek medical care (0.2–0.5). Feeling stigmatized was not significantly associated with delaying treatment. Twenty-three percent of married men who were currently living with their wife said that they were willing to tell her about their infection. Men who

felt stigmatized were less likely than those who did not to be willing to notify their spouse (0.4), and men who had 6–8 years of education were less likely than those who had gone to school for 0–5 years to tell her (0.3).

The researchers comment, “Stigmatization and discrimination against people [with STIs] undermines the ability of individuals, families and societies to protect themselves, and to provide support and reassurance to those infected.” They propose that in the interest of public health, this stigma needs to be confronted “by means of health education, the media, and social leaders.”—*J. Rosenberg*

#### REFERENCE

1. Liu H et al., Stigma, delayed treatment, and spousal notification among male patients with sexually transmitted disease in China, *Sexually Transmitted Diseases*, 2002, 29(6):335–343.

## Effects of Higher Clinic Fees On Demand and Revenue Vary by Type of Service

An increase in client fees for family planning and reproductive health services of a nonprofit program in Ecuador resulted in a loss in demand but a gain in revenue for three of the four main services offered.<sup>1</sup> When clinics of the Centros Médicos de Orientación y Planificación Familiar (CEMOPLAF) charged clients 16–44% more for their services, the number of visits generally decreased, with greater reductions occurring at higher price increases. The decline in demand, however, did not cause a loss of revenue from IUD insertion, IUD revisits and prenatal visits. In contrast, gynecology consultations showed losses in both demand and revenue (of 18% and 4%, respectively) when prices were raised by 16%. Higher fees for gynecologic services led to a 5–8% reduction in the proportion of low-income clients, but this decline showed no significant relationship with the magnitude of the price increase.

Because donor funding for family planning and reproductive health has been declining in Latin America, service providers have been looking for alternative sources of income. One option is to raise fees, but concerns exist about losing clients, particularly those with low incomes. To help CEMOPLAF managers decide on an appropriate price increase, researchers designed a randomized block study to quantify the impact of implementing different price

increases on service use and revenue. Fifteen CEMOPLAF clinics were randomly assigned to three groups, which were to increase client fees for four main services by 20%, 40% or 60%. For each service—IUD insertions, IUD revisits, gynecologic services and prenatal consultations—the researchers analyzed the mean number of visits per month and revenue in the three months before and after November 1, 1996 (the date of the price increase), as well as mean prices charged in the month before and after that date. Client characteristics were also recorded before and after the price rise.

Instead of the increases set by the investigators, the clinics implemented a range of price increments that fell into three groups: 13–21%, 31–44% and 49–67%. In addition, some clinics raised fees for the four services by differing amounts. The investigators therefore modified the study design by assigning clinics to groups according to the real price rise for each service and by assessing the effect of fee increases on each service.

Before the price rise, the most expensive of the four services was an IUD insertion (range, \$4.58–6.33) and the least expensive an IUD revisit (\$1.64–2.04). For each service, a higher price increase generally meant a greater reduction in demand—for example, the largest fee increments for IUD insertion and IUD follow-up (44% and 42%, respectively) resulted in the largest reductions in the number of visits for those services (17% and 24%, respectively).

By calculating the ratio of the percentage change in number of visits to the percentage change in price, the analysts were able to estimate the impact of the various fee increases on revenue after accounting for changes in demand for each service. The results showed that revenue rose after prices were increased for IUD follow-up, and suggested a similar effect for IUD insertion and prenatal consultation.

To illustrate more clearly the trade-off between revenue generation and service use, the researchers calculated actual changes in total revenue in the first month following the implementation of fee increases for two of the services offered. For example, in the month following price increases of 16–43% for prenatal services, revenue rose by 13–34%, despite a 3–13% reduction in the number of visits. In contrast, a price increase of 16% for gynecology visits led to a drop of 4% in revenue and a decline of 18% in demand, but an increase of 42% led to a gain in revenue of 7%, while demand fell by 30%. The analysts suggest that in practical terms, the modest revenue gain in

the last case may not be worth such a substantial reduction in clinic attendance.

Agency managers were concerned that higher prices would deter poorer clients from using services, but the researchers found no evidence of such an effect: Although the proportion of clients earning less than \$85 a month who used gynecologic services fell by 5–8% after the price change, the decline was not significantly greater at higher levels of increase. Furthermore, the proportion of gynecologic clients who were better-off (earning more than \$275 a month) did not rise in parallel with the fee increase: The proportion rose by 5–6% at each of the three levels of increase.

The researchers conclude that higher charges for CEMOPLAF's family planning and reproductive health services—including ones not included in the study, such as general consultations and contraceptive services—would likely lead to higher total revenues despite being accompanied by a loss in demand. The

analysts comment that the observed fall in attendance may not have been caused solely by the rise in fees: Winter holidays in December 1996 and civil disturbances in Ecuador in January 1997 may have been contributing factors. Unlike other studies, this one found that the raising of clinic fees did not lead to a disproportionate loss of low-income clients. Although the researchers do not exclude the influence of external factors on changes in client characteristics, they suggest that “price increases resulted in a loss of clients at both ends of the socioeconomic spectrum. ...Poor clients may have departed to the more affordable public sector, while wealthier clients may have transferred to the private sector where more amenities were available.”—*T. Lane*

#### REFERENCE

1. Bratt JH et al., The impact of price changes on demand for family planning and reproductive health services in Ecuador, *Health Policy and Planning*, 2002, 17(3): 281–287.

## In Zimbabwe, Sexual Relationships with Older Men Put Young Women at High Risk of HIV Infection

Among young people in Zimbabwe, the risk of HIV infection rises with the cumulative number of sexual partners and decreases with rising age at first intercourse.<sup>1</sup> In addition, the risk of infection is six times as high among women as it is among men of the same age. Data from more than 4,400 men and women aged 15–24 indicate that the tendency of young women to have older partners—who are more likely to be infected—is a major factor in this differential.

Between July 1998 and January 2000, researchers surveyed households in rural eastern Zimbabwe to determine the risk behaviors associated with HIV infection among adults; all 15–54-year-old men and women were eligible to take part in the study. Literate participants were interviewed by structured questionnaire or by informal confidential voting;\* nonliterate participants received face-to-face interviews. The interviews covered social and demographic information, sexual history (age at first sex and lifetime number of partners) and sexual behavior within the last two rela-

tionships in the past month (frequency of intercourse, type of relationships, frequency of condom use and partners' characteristics). All respondents provided blood for HIV testing.

Overall, 9,843 men and women participated in the study; 2,152 men and 2,276 women were younger than 25 and were included in these analyses. Male and female respondents did not differ in their median age at first sex (18.5 years), but men reported more lifetime partners than women: Among 24-year-olds, 51% of men said they had had five or more partners, compared with 5% of women. Young women reported having had sexual relationships with men who were a median of six years older, while young men reported having had sexual relationships with women who were a median of three years younger.

Fifty-one percent of young men and 39% of young women believed that their most recent partner had other partners. Young men were more likely than young women to have had casual or premarital sexual relationships (46% vs. 9% and 55% vs. 5%, respectively); however, men reported having sex less frequently in the previous two weeks than did women. Both men and women reported using condoms more consistently in their casual relationships than in relationships of 12 months

or more (51% vs. 32% and 39% vs. 6%, respectively); condom use within marriage was 5%. Men were significantly more likely than women to use condoms consistently (odds ratio, 7.5). This may be partly explained by the fact that women were significantly more likely than men to be married (9.9), and that married respondents were less likely to report condom use with their most recent partners.

In bivariate analyses adjusted for age, the risk of HIV infection among 17–24-year-old women rose with the cumulative number of partners and number of years by which women were younger than their most recent partner, and declined with rising age at first intercourse. Moreover, women whose most recent partner had other partners and women who had consistently used condoms with their most recent partner had elevated risks of infection. For men, HIV risk rose with cumulative number of partners and age difference with the most recent partner.

In the first step of a reverse stepwise multivariate regression analysis, the researchers tested the effects of personal and behavioral factors on the risk of HIV infection among all respondents who had been sexually active in the previous year. Being female was the factor most strongly associated with HIV infection (odds ratio, 6.1). Among both women and men, the risk of infection rose with cumulative number of partners and declined with rising age at first intercourse.

When the analysis was limited to respondents who had had sex in the previous month and partner characteristics were entered into the analysis, risk rose slightly with each year by which the respondents were younger than their most recent partner (1.04 for both men and women). Age at first intercourse no longer had a significant effect on women's HIV risk, and no behavioral or personal characteristics continued to have an effect for men.

Further restriction of the analysis to respondents who had had sex in the previous two weeks did not change the effects of personal and behavioral factors; however, HIV risk was elevated among those who had used condoms consistently with their most recent partner (2.0 for both men and women) and rose slightly with each year by which the respondents were younger than their most recent partner (1.04).

The researchers conclude that the high prevalence of HIV among women in Zimbabwe occurs mainly because the cultural and social norms and economic realities of the region

\*Participants were requested to record their responses to sexual experience questions on small preprinted cards, which they then placed in a locked voting box. This process is used to decrease participants' embarrassment and increase confidentiality.

influence female adolescents to have sexual relationships with older men, who are more likely than adolescent males to be HIV-positive. They note that “although it is unrealistic to expect to alter the underlying socioeconomic context quickly, understanding its nature and influence on local patterns of sexual behavior should aid development of more relevant and, therefore, more effective HIV prevention strategies.” The researchers suggest that public health programs that “highlight the extent of HIV infection among teenage girls,” focus on getting men to stop having unprotected intercourse with commercial sex workers or “strengthen the socioeconomic position of young women” could help to reduce female teenagers’ exposure to HIV.—*J. Rosenberg*

#### REFERENCE

1. Gregson S et al., Sexual mixing patterns and sex-differentials in teenage exposure to HIV infection in rural Zimbabwe, *Lancet*, 2002, 359(9321):1896–1903.

## Conflict in a Relationship Before Sterilization May Lead to Desire for Reversal

Only a small minority of women who are protected by contraceptive sterilization express regret about that method choice, regardless of whether they or their husbands have had the surgery, according to findings from a prospective, multicenter U.S. study.<sup>1</sup> Within five years after their husbands’ vasectomy, 6% of women indicated that it was not a good choice; essentially the same proportion of sterilized women (7%) expressed regret within five years after undergoing tubal occlusion. Women whose relationship was marked by substantial conflict before they underwent tubal sterilization had an elevated likelihood of regretting the decision; conflict also played a role in women’s request that either their own or their husbands’ sterilization be reversed.

For an in-depth analysis of the five-year cumulative probability of sterilization regret, investigators studied data on 3,672 women aged 18–44 who underwent sterilization between 1985 and 1987 at medical centers in six cities in the United States and 525 women of the same age whose husbands had a vasectomy at centers in five of those cities during the same years. Women were interviewed in person around the time of the surgery; those who completed at least one follow-up phone interview (one, two, three or five years later) and an-

swered a question about sterilization regret were included in the analyses. The researchers calculated life-table estimates of the cumulative probability of regret, of request for reversal and of reversal; they used hazards analysis to assess factors associated with these outcomes.

Women who had undergone tubal occlusion and wives of sterilized men had a number of characteristics in common. Nearly all women in both groups (94–95%) had at least one living child, and more than half (55–59%) said that a year or more had elapsed between their last birth and the sterilization. Nine in 10 cited completion of childbearing as an important reason for sterilization, and two-thirds cited the desire to discontinue other contraceptive use.

In several respects, however, the groups differed significantly. All of the women whose husbands had had vasectomies were married (since this was a criterion for enrollment), compared with 61% of sterilized women. In addition, wives of sterilized men were more likely to be white, were older and better-educated, and were less likely to have had an abortion and to be Medicaid recipients than were women who had undergone tubal occlusion.

Furthermore, whereas nearly three in 10 women in the vasectomy group cited their desire for the procedure as a reason for their husbands’ sterilization, in the tubal occlusion group, only half this proportion said that their husbands’ desire for the operation was an important factor in the decision. Women in the vasectomy group were less likely than those who had been sterilized to cite financial pressures or other people’s opinions about sterilization as reasons for that method choice; they were more likely to believe that a pregnancy would have strained the couple’s relationship.

The five-year cumulative probability of regret—i.e., of ever answering no when asked if sterilization was a good choice for the couple or, in the case of tubal occlusion, for the woman herself—was 6% among wives of sterilized men and 7% among sterilized women; the difference was not statistically significant. The probability that the woman requested reversal was the same (2%) in both groups. (One percent of men asked for a vasectomy reversal; the researchers did not ask sterilized women if their husbands or partners had asked them to have the surgery reversed.) Fewer than 1% of sterilized men or women obtained a reversal.

Results of the hazards analysis revealed no significant predictors of regret among women in the vasectomy group. Among sterilized women, however, the analyses identified a

number of associations: The likelihood of regret was elevated if the woman had been 30 or younger at the time of the surgery (rate ratio, 2.2), was black (1.6) or reported some or a lot of conflict in the relationship before the sterilization (2.4–3.1); in addition, women who said their husbands or partners had favored sterilization more strongly than they had were more likely to express regret than were those who reported that the partners had had similar feelings about the sterilization decision (2.7). Women who had undergone tubal occlusion because they had completed childbearing or had not wanted to use other contraceptives had a reduced likelihood of regretting their decision when compared with women who did not include these among their reasons for choosing sterilization (0.6–0.7).

A second set of hazards analyses showed no significant associations between the reasons women cited for choosing sterilization and requests for or actually obtaining a reversal. However, conflict in the relationship prior to sterilization was an important factor: In the vasectomy group, the likelihood of a woman’s requesting that the procedure be reversed was sharply higher among those reporting a lot of conflict than among those reporting none (rate ratio, 25.3). In the tubal occlusion group, women who reported either some or a lot of conflict had an elevated likelihood of wanting a reversal (2.4 and 5.9, respectively); those who reported some conflict also had elevated odds of actually obtaining one (3.9).

As the researchers note, the study is limited by the small size of the vasectomy group, the lack of information directly from the men represented by that group and the fairly short follow-up period. Citing a study that demonstrated an increasing probability that women would regret their sterilization decision 7–14 years later, they acknowledge that longer-term follow-up could uncover more regret among wives of men who have undergone vasectomy. Nevertheless, they conclude that “most couples who choose sterilization...are satisfied with their decision and do not experience regret.” They recommend that when providers counsel men and women about sterilization, they discuss the possibility of regret and, especially, that they emphasize “the desirability of the couple reaching a decision that they are both comfortable with and agree upon.”—*D. Hollander*

#### REFERENCE

1. Jamieson DJ et al., A comparison of women’s regret after vasectomy versus tubal sterilization, *Obstetrics & Gynecology*, 2002, 99(6):1073–1079.