In Bangladesh, a Woman's Risk of Death Is Elevated For Two to Three Years After the Birth of Each Child

In rural Bangladesh, women's mortality is not directly related to the total number of children they bear or to their pace of childbearing.[1] Analyses based on Matlab Demographic Surveillance System data show, however, that each birth is associated with an elevated risk of death that extends for more than two years following the immediate perinatal period. In addition, the odds of death are positively associated with age and negatively associated with height and body mass index. The authors estimate that reducing lifetime exposure to the extended risk associated with individual births could lower mortality among reproductive-age women by approximately one-quarter.

Previous research on the association between women's risk of mortality and various aspects of childbearing—for example, parity and the interval between births—has yielded mixed results. To investigate further the relationship between mortality and fertility, researchers examined data from 2,031 married women who had originally participated in a study on fertility conducted in the mid-to-late 1970s. That study had collected information on reproduction (e.g., pregnancies, terminations and births), maternal health (e.g., height, weight and body mass index) and child health each month for three years, as well as socioeconomic information (e.g., education and religion) at study entry. Women were then followed up as part of the Matlab Demographic Surveillance System, which records all births, deaths and migrations occurring each month. The researchers converted data into woman-years for each woman for each calendar year, beginning with the year of study enrollment and ending with the year of death or migration, or 1996; data from returning migrants were excluded from analysis.

Researchers examined data on the basis of age at the start of a given woman-year. By the end of the study period, the 2,031 women had contributed a total of 34,067 woman-years between ages 16 and 54—the age by which all women had completed childbearing. The average height of the women was about 148 cm and the average body mass index was 18.5. Roughly three-quarters (77%) of women had not received any schooling, and 13% were Hindu. By the end of follow-up, a total of 3,937 children had been born and 100 women had died. On average, women of reproductive age had had a total of five live births each and had given birth at a slightly faster pace than had women in Matlab in 1979 (rate ratio, 1.1).

Using a series of discrete-time models, the investigators tested the effects of fertility behavior on women's risk of dying during a given year between ages 16 and 54, with controls for background and health factors. In an analysis that included only these factors, the risk rose with increasing age and declined with increasing height and body mass index. Succeeding models that added fertility-related variables found that neither parity nor the pace of childbearing was associated with mortality risk. Furthermore, the researchers found no interaction between these two factors and age, body mass index or height. Hence, they suggest, the risk of mortality "is not directly related to cumulative effects" of parity and pace of reproduction on health—in particular, incomplete recovery between frequent, closely spaced births (a phenomenon known as "maternal depletion").

In the final model, the odds of dying were doubled among women who had given birth in the current year or in the past two years (odds ratio, 2.0), leading the analysts to suggest that each birth is associated with an elevated risk of maternal mortality that lasts for 2–3 years. In this analysis, the odds of dying remained positively associated with age (1.1), and negatively associated with height (0.96) and body mass index (0.8).

Furthermore, the researchers estimated that decreasing the lifetime exposure to the extended risk associated with each birth (i.e., by decreasing fertility) would result in a substantial reduction in mortality among women of childbearing age. For example, for a woman giving birth for the first time at age 16 and then once every three years, the probability of dying before age 50 would decrease by 19% (from one in 13 to one in 16) if she were to have a total of three instead of seven children; the reduction would be 24% if the birth interval were four years. Similarly, if a woman were to have three instead of seven children, starting at age 21, the probability of dying before age 50 would decrease by approximately one-quarter—23% with three-year birth intervals and 28% with four-year intervals.

The analysts conclude that in Matlab, "lifetime childbearing experience does affect a woman's survival," not because of maternal depletion between successive births, but because each birth poses an elevated risk of mortality, which, the authors note, lasts for several years beyond the usual postpartum observation period of six weeks. The researchers comment that the risk may be related to the pregnancy or birth itself, or to illnesses arising during or aggravated by pregnancy or birth. They add that family planning programs in Bangladesh "have surely contributed to the increase in female life expectancy...by reducing the number of times a woman was exposed to the possibility of death from extended maternal risk." *–T. Lane*

REFERENCE

1. Menken J, Duffy L and Kuhn R, Childbearing and women's survival: new evidence from rural Bangladesh, *Population and Development Review,* 2003, 29(3):405–426.

Antenatal Education Helps Turkish Women Adopt Health-Promoting Behavior

First-time Turkish mothers who participated in a community-based antenatal education program were more likely than nonparticipants to adopt behaviors beneficial to their infants' and their own health soon after delivery.[1] Women who attended the program had significantly elevated odds of beginning to breastfeed within two hours after giving birth and of taking their infant for a checkup within seven days. Contraceptive use in general was not associated with program participation, but the odds of using a method that required male

involvement (i.e., condoms or withdrawal) three months after delivering were increased among participants.

The program, located in a community center in a lower-middle-class area of Istanbul, was designed for women who had had minimal if any sex and reproductive health education. Its eight two-hour sessions were led by a nurse, a facilitator and a trained member of the community; among the topics covered were health and nutrition during pregnancy, childbirth (including stages of labor and delivery, and interventions that might be needed in various circumstances), infant health and care, and postpartum health and contraception. As part of a program evaluation, researchers conducted in-home interviews with program participants and with nonparticipants who had had their first child at the same hospitals, and compared the results using chi-square tests and logistic regression. All women were interviewed 2.5–3.0 months after they delivered.

The analyses included 100 program participants and 157 controls who completed interviews between October 1998 and March 2000. Overall, roughly 40–50% of the women were older than 24, had been married less than two years and were natives of Istanbul. Nearly two-thirds had had more than eight years of formal schooling, but only one-quarter had ever worked outside the home; three in 10 lived in the same apartment building as some of their relatives. Half were married to men younger than 30, and three-quarters had a husband with at least a middle school education. The majority of women had health insurance, saw a private-sector provider for antenatal care and had delivered in a private hospital.

Program participants and controls had generally similar background characteristics. However, higher proportions of participants than of controls were older than 24 (60% vs. 40%), had been born in Istanbul (62% vs. 41%) and had gone to school for more than eight years (75% vs. 57%); a lower proportion had relatives who lived in their building (20% vs. 34%).

Interview data revealed several differences between program participants' and controls' postpartum health-related behaviors. Women who had attended the antenatal program were more likely than nonparticipants to have begun breast-feeding within two hours after delivery, to currently be breast-feeding, to currently be feeding their infant only breast milk and to have taken the baby for a checkup within a week after delivery (unadjusted odds ratios, 1.9–2.9). They also were more likely to be using a contraceptive and to be using a method requiring their partner's cooperation (1.9–2.1).

Notably, although the program encouraged women to choose vaginal birth unless a cesarean delivery was medically indicated and to have a postpartum checkup, the proportions of participants reporting these outcomes were only 43% and 59%, respectively, and were statistically indistinguishable from the proportions among controls. Likewise, despite the program's aim of preparing women for childbirth, only 27% of participants—the same proportion as among controls—said that the experience was as they had expected it to be.

In analyses that controlled for background characteristics and other factors that might influence women's health-related behaviors, only three behaviors remained significantly associated with program participation. Women who had attended the program were more likely than controls to have begun nursing within two hours after delivering (odds ratio, 2.2), to have taken the infant for a checkup within the first week (3.6) and to be using a contraceptive that involves male cooperation (1.9).

A number of factors besides program participation were associated with these behaviors. Women living in the same building as relatives had reduced odds of having begun to breast-feed within two hours (odds ratio, 0.5), and those aged 24 or younger were less likely than their older counterparts to be using a contraceptive requiring male involvement (2.0). The odds of beginning to nurse within two hours were elevated among women who had had a vaginal delivery (2.8) and were reduced among those whose baby weighed less than 3,000 g at birth (0.5). Women who gave birth in public hospitals were less likely than those who delivered in private facilities both to begin breast-feeding shortly after delivery (0.4) and to have their infant checked by a health provider within a week after birth (0.1). Those who had previously practiced contraception were more likely than those who had never done so to be using a method that involved their partner (2.5).

The researchers observe that the health behaviors that were associated with program participation are "new" ones that, because of provider misinformation, routine hospital practices or traditional societal norms, are "not widely practiced in the population." By contrast, some outcomes that were not associated with program attendance "are not completely under women's control." For example, many obstetrician-gynecologists in Istanbul prefer cesarean delivery and may recommend it for nonmedical reasons. Thus, the researchers conclude that "antenatal education is not the only answer [to Turkey's persistent maternal and child health problems], but it can be part of the answer"; increased demand for and quality of reproductive health services is another important part.–*D. Hollander*

REFERENCE

1. Turan JM and Say L, Community-based antenatal education in Istanbul, Turkey: effects on health behaviours, *Health Policy and Planning,* 2003, 18(4):391–398.

After Vasectomy, Sperm Clearance May Occur Later Than Previously Thought

A sizable minority of men receiving vasectomy by simple ligation and excision—perhaps the most commonly performed male sterilization technique in low-resource settings—may still be at substantial risk for fertility six months after the procedure. Of more than 200 participants in a prospective study in Mexico,[1] 17% had not achieved sperm clearance by 24 weeks, according to semen analysis.

Although male sterilization is a highly effective and permanent form of contraception, men who have just undergone the procedure must typically use a backup method until semen analysis confirms the absence of sperm. In low-resource areas, however, such testing is often unavailable; thus, men are told to follow current clinical guidelines—to use backup for 10–12 weeks, or until they have ejaculated 15–20 times.

To test the validity of 12 weeks and 20 ejaculations as cutoff points, researchers enrolled men seeking a vasectomy at three public clinics in Mexico City in 1995–1996, and followed them for up to 24 weeks after the procedure. Six experienced surgeons (two per clinic)—who had attended a workshop designed to ensure use of a standardized technique—performed a simple ligation and excision procedure.

The men returned to the clinic every other week to provide a semen sample, which was examined microscopically for sperm concentration and motility according to World Health Organization guidelines, and to report the number of ejaculations since their most recent visit. Men were considered to have achieved sperm clearance at their first of two consecutive visits in which the semen sample contained no sperm.

The analysis included 217 men, aged 21–58 years (mean, 32 years). By the end of the study, 78% of men had achieved sperm clearance and 17% had not; 5% had dropped out or had been lost to follow-up. Of those whose semen samples still contained sperm, fewer than one-third had "persistent but low sperm concentrations," and were presumed to have had a successful vasectomy with delayed sperm clearance; the remainder were considered to have had a failed vasectomy. In the latter group, sperm concentrations at 22–24 weeks were greater than three million sperm per mL of semen, including active sperm; the average concentration was greater than 39 million/mL, indicating "a significant risk for pregnancy" for the patients' fertile female partners.

Time to sperm clearance varied widely. Sperm clearance was reached at medians of 10 weeks and 32 ejaculations. At 12 weeks, 63% of patients produced sperm-free semen; 13% had at least three million sperm per mL, most of them more than 20 million/mL. At the 20th ejaculation, only 44% of men produced sperm-free semen, whereas 21% had sperm concentrations exceeding three million per mL.

Cumulative event probabilities estimated by life-table analysis showed that sperm clearance was achieved by 60 per 100 study participants at 12 weeks, and by 82 per 100 at 22 weeks. In addition, the Kaplan-Meier cumulative event probability of achieving sperm clearance was 28 per 100 men at the 20th ejaculation.

According to chi-square analysis, failure rates among individual surgeons (range, 7–20%) did not differ significantly. However, each surgeon performed only 29–45 vasectomies in the study, which may have precluded the detection of meaningful differences.

The researchers believe that the most likely cause of vasectomy failure in the study was reattachment of the severed vas ends soon after vasectomy, noting that men with a failed vasectomy typically experienced a brief, dramatic reduction in sperm concentration sometime in the early postvasectomy period. Furthermore, they suggest that the high number of such cases in the study "was likely related to the occlusion method used." However, they say that they are unaware of any randomized, controlled trial to date that has compared simple ligation and excision with other techniques—for example, those in which the severed ends of the vas deferens are sealed by applying surgical clips, by burning (or cauterizing) the ends or by covering one end with the tissue layer surrounding the vas.

According to the researchers, the study findings show that "guidelines...based only on the time or number of ejaculations after vasectomy cannot adequately replace semen testing when ligation and excision are used." For situations in which semen testing is not an option, they note that a cutoff of 12 weeks is probably more reliable than that of 20 ejaculations, yet each "leaves a substantial number of men at risk for continued fertility."–*C. Coren*

REFERENCE

1. Barone MA et al., A prospective study of time and number of ejaculations to azoospermia after vasectomy by ligation and excision, *Journal of Urology,* 2003, 170(3): 892–896.

Midwife Care Is as Safe as Physician-Led Care For Nepalese Women with Low-Risk Pregnancies

For women in Nepal who have low-risk pregnancies, giving birth under the care of a midwife appears to be as safe as giving birth under the care of a physician, and is generally less invasive.[1] In a study among women expected to have an uncomplicated labor and delivery, 13% of those cared for solely by midwives had a complication, a proportion no higher than that among those cared for by physicians. Midwife care was associated with a higher risk of artificial rupture of membranes but lower risks of use of oxytocin to augment labor, of warning signs of fetal distress, of episiotomy and of a cesarean delivery. Infants of women in the two groups were similarly healthy at birth. The likelihood that a woman would attend postnatal clinics and family planning clinics was greater among those cared for by midwives.

Women in labor who arrived at Patan Hospital in Lalitpur, Nepal, between November 1997 and February 1998 were enrolled in the study if screening indicated that they were at low risk for complications. The women received either care delivered solely by midwives (nurses and nurse-midwives) in an independent birthing center or care led by physicians in a maternity unit. The choice between the two was generally made by the women. Women cared for in the birthing center who developed complications were transferred to the maternity unit, but their outcomes were analyzed as birthing center outcomes. After delivery, researchers interviewed the women and reviewed their records to assess rates of interventions, complications and use of services.

Analyses were based on 550 women who received midwife-guided care and 438 women who received physician-guided care. The median ages of the women in the two groups were 23 and 24, respectively. Overall, the women had attended school for a median duration of 10 years, but women cared for by physicians had relatively more schooling. About three-fourths of the women reported that they had running water in their homes. Similar proportions in each group smoked and drank alcohol. The majority of women (67–75%) had received their pregnancy care at Patan Hospital, whereas the minority had received this care from private doctors (19–27%) or other providers.

Nearly equal proportions of women cared for by midwives and those attended by physicians had a complication during labor (13% and 15%, respectively), most commonly, a failure of labor to progress. Rates of individual types of complications were similar, with the exception of a lower rate of prolonged rupture of the membranes among women cared for by midwives (2% vs. 5%).

With respect to interventions, membranes were artificially ruptured in 53% of women cared for by midwives, compared with 42% of women cared for by physicians (risk ratio, 1.3). Substantially smaller proportions of women cared for by midwives than of those cared for by physicians were given oxytocin to augment labor (12% vs. 47%) or prostaglandins after rupture of the membranes to facilitate labor (fewer than 1% vs. 4%), corresponding to risk ratios of 0.3 and 0.1, respectively. Nonetheless, the duration of labor did not differ between groups.

Although the vast majority of women in both groups had normal vaginal deliveries (96% with midwife-delivered and 87% with physician-led care), those under the care of midwives were significantly more likely to have this type of delivery (risk ratio, 1.1). In turn, these women had a significantly lower risk of having a vacuum delivery* or a cesarean section relative to women who were cared for by physicians (0.3 and 0.4, respectively).

Slightly more than half of women had an episiotomy, and one-fifth developed a tear of the perineum. Compared with women cared

*A type of assisted vaginal delivery in which a vacuum extractor is used to pull a baby out of the birth canal.

for by physicians, those cared for by midwives had a lower risk of episiotomy (risk ratio, 0.6) but a higher risk of perineal tearing (1.7). When these two outcomes were combined, midwife care was associated with a significantly lower risk of any type of perineal trauma (0.8).

Relative to their counterparts who gave birth under the care of physicians, women attended by midwives were significantly less likely to show warning signs of fetal respiratory distress (risk ratio, 0.6). Compared with women who were not given oxytocin, those given the drug had nearly three times the risk of such warning signs (2.8). In addition, the likelihood of being given oxytocin was higher for women who had received their pregnancy care from a private provider rather than from a public provider (1.3).

Infants of women cared for by midwives and those of women receiving physician-led care had similar one-minute Apgar scores, but those born to women in the former group had a significantly lower risk of being admitted to the special baby unit than did those born to women in the latter group (risk ratio, 0.5). Three infants of women receiving care from midwives and four infants of women receiving physician-led care died; in all but one case, the cause of death was birth asphyxia.

After their delivery, roughly half of the women studied attended a postnatal care clinic at the hospital, and about a quarter visited a family planning clinic. Attendance for each type of care was greater among women whose labor and delivery had been attended by midwives than among those cared for by physicians (risk ratios, 1.3 and 1.9, respectively).

"Health care providers and communities should begin to see nurses and midwives as safe, qualified and desirable caregivers who can provide cost-effective services with low intervention rates," the researchers contend. More specifically, they conclude, their findings suggest that policymakers in developing countries should consider setting up additional pilot programs of the birthing center model.–*S. London*

REFERENCE

1. Rana TG et al, Comparison of midwifery-led and consultant-led maternity care for low risk deliveries in Nepal, *Health Policy and Planning,* 2003, 18(3):330–337.

Indian Women Who Have Daughters but No Sons Face an Increased Risk of Marital Dissolution

In India, where sons have traditionally been strongly preferred to daughters, low-parity women with no sons have a significantly elevated risk of having their marriage dissolve.[1] Using data from the first two National Family Health Surveys, researchers found that the odds of marital dissolution are about 40% higher among women whose only child is a girl than among those who have only a son; for mothers of two children, those with daughters have 70% higher odds of being divorced or separated than those with sons. Moreover, the association between having only a daughter and marital dissolution holds for women in most demographic, social and geographic subgroups.

The surveys, conducted in 1992–1993 and 1998–1999 among nationally representative samples of ever-married women of reproductive age, collected information on marital dissolution (divorce, separation and desertion) and many theoretically important covariates. To assess the relationship between marital dissolution and the sex composition of a woman's children, the analysts examined data on nonwidowed women aged 25 or older who had been married only once and had had at least one child.

Most of the 116,498 women included in the analyses were Hindu (81%), lived in rural areas (67%) and were not members of scheduled castes (75%); half lived in the country's northern region, and the rest were about evenly divided between residents of the East and South. Ten percent had been born in the 1940s, 34% in the 1950s, 45% in the 1960s and 12% in the 1970s. On average, women had been 17.5 years old when they married; they had had a mean of 3.7 years of formal education, and their husbands had had 6.3. One in 10 women had had one child, one in four had had two and the remainder had had three or more.

Overall, 2% of women were divorced or separated. The proportion varied from 1% to 3% according to women's background characteristics, but it ranged more widely by parity. Some 6–7% of women with one child were no longer married, compared with 2–3% of those with two children and 1% of mothers of three or more. The data suggest that the risk of marital dissolution was higher for women with daughters only than for those with at least one son; the researchers used logistic regression to examine this relationship, controlling for women's background characteristics.

In the multivariate analysis, women with one daughter and no sons had significantly higher odds of being divorced or separated than those with only a son (odds ratio, 1.4). Non-Hindu women had an increased likelihood of marital dissolution (2.1), as did residents of the South and the East (2.7 and 2.0, respectively). The odds of marital dissolution fell by about 5% for each year older a woman was when she married and for each year of her or her husband's education. Analyses including interaction terms revealed that the association between having only a daughter and divorce or separation did not vary significantly by a woman's education, religion, caste or residence (region or urban vs. rural). However, the association was weaker for women born in the 1960s than for those born in the 1940s; the researchers note that although this finding could indicate an erosion of the association over time, it also could reflect differences by age or marital duration.

Associations between most of the control variables and the risk of marital dissolution for women at higher parities were similar to those for women with one child. In addition, among mothers of two or more children, urban women and members of a scheduled caste or tribe were at increased risk of marital dissolution. When all of these variables were taken into account, women with two daughters and no sons had a significantly higher likelihood of being divorced or separated than those with two sons and no daughters (odds ratio, 1.7); the risk of marital dissolution for women with one child of each sex was not significantly different from the risk for women with two sons.

Among mothers of three children, women with only sons had the same risk of marital dissolution as those with only daughters or children of each sex; however, when the reference group was women with two sons and one daughter, women with three daughters had about a 60% increase in odds of divorce or separation. No significant associations were found at parity four or higher.

Given the long-standing preference for sons in Indian society, the researchers were not surprised to learn that "having at least one son is associated with a statistically significant and substantively important reduction in the risk of marital disruption among Indian women at lower parities." They were, however, struck by "the pervasiveness of the divorce-inhibiting ef-

fect of having sons across subgroups of Indian women"; this finding leads them to conclude that the relationship between marital dissolution and the sex composition of children is unlikely to change in the near future, despite economic development, increased urbanization and women's educational advances in India.–*D. Hollander*

REFERENCE

1. Bose S and South SJ, Sex composition of children and marital disruption in India, *Journal of Marriage and Family,* 2003, 65(4):996–1006.

Filipino Couples' Traits Are Tied to Spousal Agreement On Pregnancy Wantedness

In the Philippines, married couples who have large families, and those who depend solely on the husband for their household income, hold more fatalistic attitudes or are practicing Catholics are significantly more likely than other couples to agree that their most recent pregnancy was unwanted than they are to agree that it was wanted (odds ratios, 1.5–3.4).[1] According to data from 369 couples who participated in a survey on fertility and contraception, higher-parity couples are more likely than others to report that their last pregnancy was wanted only by the husband (1.5) or only by the wife (1.8) than that it was wanted by both, and women who find it difficult to communicate with their husband about sex or family planning have elevated odds of having had a pregnancy that only their husband wanted (1.8).

To investigate the influence of gender equality, fatalism and couple communication on spousal agreement about pregnancy wantedness, researchers examined cross-sectional data from a 1993 survey of 780 Filipino women aged 25–44 and their spouses. Participants were selected using probability samples from eight rural and five urban neighborhoods on the island of Luzon to roughly reflect the makeup of the general population. Respondents were asked a range of demographic and fertility-related questions, including whether they had wanted a child at the time of their last pregnancy. Spouses were questioned separately but simultaneously when possible. The researchers limited the sample to couples who reported having had at least one pregnancy in the five years preceding the survey and excluded respondents for whom survey data were incomplete; the remaining 369 couples made up the sample for analysis.

Pregnancies (including those reported as mistimed) were categorized as wanted only if both spouses reported that they had wanted to have a child at the time of conception or at some time in the future; all other pregnancies (including those wanted by only one spouse) were classified as unwanted. The researchers included an indication of whether the husband was the sole wage earner in the past three months as one measure of gender equity. Other explanatory variables included couples' combined level of agreement with the idea that the important things in life are out of their control, perceived ease and frequency of discussion about sex and family planning, and religious affiliation and frequency of participation. Wife's age, parity and household income were added to control for demographic factors that may have affected spouses' fertility desires.

Fifty-six percent of couples said that their most recent pregnancy was mutually wanted, 25% wanted only by the husband, 8% wanted only by the wife and 11% mutually unwanted. The percentage of couples in which both spouses reported that they had wanted their most recent pregnancy tended to decrease as age and parity increased, though only parity was statistically significant in the multivariate analysis.

The researchers used multinomial logit regression to identify factors associated with couples' reports that their most recent pregnancy had been unwanted by one or both spouses instead of mutually wanted. The odds that couples would report their most recent pregnancy as mutually unwanted rose with each additional child (odds ratio, 2.8). Higher-parity couples also were more likely to disagree about pregnancy wantedness: Their odds of reporting their last pregnancy as wanted by the husband only or the wife only were elevated (1.5 and 1.8, respectively). Couples in which the husband was the sole source of household income had higher odds than those in which other family members brought in money of reporting a mutually unwanted pregnancy (3.0). The most recent pregnancies of women who reported difficulty in communicating with their husband about sex were significantly more likely than those of other women to have been wanted only by the husband (1.8). In addition, practicing Catholics and couples with a high level of fatalism were more likely than other couples to say that that their most recent pregnancy had been mutually unwanted rather than mutually wanted (3.4 and 1.5, respectively).

The researchers acknowledge that cross-sectional data are imperfect indicators of past circumstances. They suggest that future studies develop better measures of "the relative power in fertility discussions, the reasons for relative power differences, and the timing and frequency of discussion about fertility planning both before and after pregnancy."–*R. MacLean*

REFERENCE

1. Williams L and Sobieszczyk T, Couple attitudes and agreement regarding pregnancy wantedness in the Philippines, *Journal of Marriage and Family,* 2003, 65(4):1019–1029.

Long-Term Use of Female Condom May Hinge Partly On Depth of Instruction

In the month after they were randomly assigned to an intervention that included the female condom in an array of strategies aimed at preventing unprotected intercourse, participants perceived the method to be more effective than nonparticipants did, were more likely to talk to their partners about it and were more likely to try it. However, data gathered during a trial of the intervention show that over the next several months, most differences disappeared, and most women who tried the female condom did not continue using it. The odds of continued use were increased if women felt sure of their ability to use the method, if they or their partners were satisfied with it, if they had negative or neutral feelings about male condoms, and if they had ever used the diaphragm.[1]

The 360 study participants were recruited from a family planning clinic in New York City in 1994–1997; after completing baseline interviews, they were randomly assigned to an eight-session intervention group, a four-session group or a control group. Women in both intervention groups were taught skills for negotiating with partners about male and female condoms; they also received information about the female condom, practiced inserting it into a pelvic model, received female condoms and strong encouragement to use them, and talked with other participants about their experiences in using the method. At baseline and in three follow-up interviews (at one, six and 12 months), women provided information about their sexual behavior, method use, communication with their partner about safer sex, perceptions of male and female condom effec-

tiveness, overall impressions of these two methods and perceptions of their ability to use the female condom.

Participants were predominantly black (72%) and never-married (90%); their average age was 22 years. Before enrolling in the study, 58% had ever had a sexually transmitted disease (STD). Although 75% had used a male condom at some point in the previous three months, only 25% reported consistent use. Fourteen women had ever used a female condom. The majority of participants (76%) had had only one male partner in the past three months, but a substantial minority (41%) knew or suspected that their partner was not monogamous, and 18% said that he had recently had STD symptoms.

During follow-up, 109 women reported having used a female condom for the first time; most of them (76) had done so before the one-month interview. The main reasons women cited for first-time use were that they wished to try something new (47%) and they had attended the intervention (43%). Fifty-nine percent of first-time users were somewhat or very satisfied with the method, and 50% reported that their partners were at least somewhat satisfied with it. Half of those who tried the method considered it easy to use; most of those who found it difficult to use reported problems inserting the device. Of the 93 women who reported first use at the one- or six-month interview, only 21 also reported use at a subsequent interview.

At the one-month follow-up, intervention participants and controls reported significantly different attitudes and behaviors related to the female condom. Women in both the four- and the eight-session intervention groups gave the method higher effectiveness ratings than did those in the control group; women in the eight-session group also had significantly more positive views of it than did controls. Intervention participants had significantly elevated odds of having negotiated female condom use with their partner (odds ratios from logistic regression analysis, 10.3 for the eight-session group and 3.9 for the four-session group) and of having tried the method for the first time (9.5 and 4.4, respectively). Among first-time users, significantly higher proportions of women from the intervention groups than of controls were very or somewhat satisfied with the method (69–70% vs. 33%).

Far fewer differences were observed between intervention participants and controls later in the follow-up period. At six months, women in the eight-session group had significantly elevated odds of saying that they had talked with their partner about the female condom since the previous interview (odds ratio, 2.4); women in both intervention groups were likelier than controls to give this response at 12 months (3.6–3.7). Also at 12 months, women in the four-session group rated the female condom as more effective than did controls. Participation in the intervention was not associated with first-time use of the female condom at six or 12 months.

The researchers used logistic regression to examine the predictors of first-time and continued use of the female condom. Results indicated that the likelihood of first-time use was elevated among women who participated in the intervention (odds ratios, 5.4 for the eight-session group and 3.0 for the four-session) and those who had negotiated safer sexual behavior with their partner before enrolling in the study (1.8); it was lower among white women and those of other races than among blacks (0.2). Among the factors associated with continued use, several were related to the method itself: Women had increased odds of using the female condom more than once if they considered themselves able to use it (1.9), if they had an overall positive impression of it (3.5), if they were satisfied with it (2.3) or if their partner was (4.3). Other significant predictors of continued use were ever having used the diaphragm before entering the study (5.4), having negative or neutral feelings about the male condom at study entry (2.9), and having talked with a partner about the female condom between baseline and the one-month interview (5.3).

The researchers conclude that the female condom is "difficult for women to adopt without...extensive training in its use," including the opportunity to practice inserting the device. Additionally, they observe that although the method has been promoted as a feasible one to use in the absence of partner support, the finding that partner satisfaction predicted continued use suggests a need to make the female condom acceptable to men. They call for both individual-level interventions and policy changes such as increased promotion to help ensure that the method's potential to contribute to STD prevention is realized. *–D. Hollander*

REFERENCE

1. Hoffman S et al., Female-condom use in a gender-specific family planning clinic trial, *American Journal of Public Health,* 2003, 93(11):1897–1903.

Treating Common Vaginal Infections May Lower Women's Herpes Risk

Women have roughly doubled odds of having herpes simplex virus type 2 (HSV-2) infection if they have abnormal vaginal flora or if they have ever had an uncircumcised sex partner, and their odds are increased by half if group B *Streptococcus* is present in the vagina.[1] These "previously unidentified associations," found in a cross-sectional study among young, nonpregnant women in Pittsburgh, Pennsylvania, a city in the eastern United States, could point the way toward new interventions for reducing the incidence of genital herpes, according to the researchers, who describe the disease as "a significant public health concern." Other findings support independent associations between HSV-2 infection and recent smoking or douching (which have received little research attention), as well as more established risk factors.

To identify new and potentially modifiable factors associated with HSV-2 infection in women, researchers conducted a study among gynecologic patients at three Pittsburgh-area health clinics during 1998–2000. Women were eligible for the study if they were aged 18–30, were not pregnant, did not have vaginal bleeding and had not used vaginal products in the 24 hours before their examination. The women provided background information during interviews. Serum samples from the women were assayed for antibodies to herpes simplex virus type 1 (HSV-1) and HSV-2 (the more common cause of genital herpes). Vaginal swab and smear specimens were cultured for an assessment of the presence of various microorganisms; on the basis of these results, women were classified as having normal flora, intermediate flora or bacterial vaginosis. Tests for trichomoniasis and gonorrhea were done in some women.

The majority of the 1,207 women included in analyses were white (62%); about a third were black (34%), and the rest were of other ethnicities (4%). Laboratory test results indicated that 25% were infected with HSV-2; only 14% of these women were aware that they were infected.

At the univariate level, the prevalence of HSV-2 infection varied significantly according to a wide range of demographic and behavioral characteristics, women's history of reproductive tract infections and findings on their vagi-

nal flora. Using these results, the researchers conducted logistic regression analysis to determine which factors were independently associated with HSV-2 prevalence.

In the multivariate analysis, black women's odds of being infected with HSV-2 were more than three times those of white women (odds ratio, 3.2). Compared with 18–20-year-olds, women aged 21–25 had a 50% increase in odds (1.5), while women aged 26–30 had nearly tripled odds (2.7).

The odds were elevated by half for women who reported smoking or douching in the past four months (odds ratio, 1.5 for each) and were similarly increased for women who reported having five or more male sex partners in their lifetime (1.4). Compared with women who had never had an uncircumcised sex partner, women who had ever had such a partner had more than doubled odds (2.2) and women who were unsure had nearly tripled odds (2.9).

Women's odds of having HSV-2 infection were about doubled if they had ever had bacterial vaginosis (1.8), gonorrhea (1.9) or trichomoniasis (2.3); the odds were elevated by half for women who had group B *Streptococcus* present in the vagina (1.5). In addition, compared with women who had normal vaginal flora, women who had intermediate flora or bacterial vaginosis had roughly doubled odds of infection (1.7 and 2.2, respectively). Similarly, among the women who were tested for trichomoniasis and gonorrhea, the odds of HSV-2 infection were twice as high for women who had altered vaginal flora and women who had bacterial vaginosis as for those with normal vaginal flora (2.2 and 1.9).

Some of the factors that this study links to HSV-2 infection are modifiable and could be targeted by prevention interventions, but as the researchers note, longitudinal studies will be needed to determine if they increase women's susceptibility to HSV-2 infection. Confirmation that bacterial vaginosis increases a woman's risk would have important implications because it is the most common vaginal infection, yet it can be effectively and inexpensively treated, the investigators contend. Noting that HSV-2 infection may also promote HIV infection, the researchers conclude that "in the absence of vaccines that effectively prevent the acquisition of HIV or HSV-2, treatment of [bacterial vaginosis] may represent a cost-effective means of slowing the transmission of these viruses."–*S. London*

REFERENCE

1. Cherpes TL et al., Risk factors for infection with herpes simplex virus type 2: role of smoking, douching, uncircumcised males, and vaginal flora, *Sexually Transmitted Diseases,* 2003, 30(5):405–410.