Global Abortion Rate Stabilizes, but Unsafe Procedures Remain the Norm in Developing Countries

The worldwide abortion rate was essentially stable between 2003 and 2008, after having declined during the previous eight years, a new analysis indicates.[1] About 44 million abortions were performed in 2008, which translates to 28 per 1,000 women of reproductive age, a rate only slightly lower than that five years earlier (29 per 1,000). More than four-fifths of these abortions took place in developing countries, where more than half (56%) of abortions were unsafe.

The new study was a sequel to prior analyses that estimated worldwide abortion statistics for 1995 and 2003. The researchers estimated numbers and rates of abortion by country and region, and compared the findings to those for the earlier years. They obtained data from a variety of sources, assessed its quality and made adjustments as needed to compensate for shortcomings.

As in the prior analyses, the researchers generally considered abortions unsafe if they were performed in a country with highly restrictive abortion laws, or if they were done in a country with less restrictive laws but did not meet the country's legal requirements. Safe abortions were those that met legal requirements in a country where abortion was allowed on request or on socioeconomic grounds, or where, if laws were interpreted liberally, abortion was legal to preserve a woman's physical or mental health. However, the researchers deviated from these classifications when called for by empirical evidence; for example, although abortion is broadly legal in India, many pregnancies are terminated by unauthorized providers and categorized as unsafe.

In two-thirds of the countries with liberal abortion laws, formal abortion statistics were available. These data were used unaltered if experts familiar with the country considered the statistics at least 95% complete; if the data did not meet this threshold, the number of abortions was increased by 5–154% (mean, 26%) to yield a more accurate estimate. Similarly, adjustments for underreporting were made to data from countries whose only abortion estimates were from national surveys. If no official statistics, survey data or estimates were available, the investigators assigned estimated rates on the basis of the country's fertility and contraceptive rates and other factors.

For countries with restrictive abortion laws, the investigators used data from official sources, nongovernmental organizations, databases and experts, giving preference to estimates published in peer-reviewed journals. In some cases, numbers and rates were estimated using data on the number of women who received medical treatment for abortion complications and the estimated proportion of abortion recipients who required treatment for complications. In other cases, survey-based data were used and adjusted for underreporting. For some countries (most of them small), the investigators generated national estimates by extrapolating from subnational data, or by assuming that rates mirrored those of countries that were nearby or had similar abortion laws, fertility rates and levels of contraceptive use.

Overall, an estimated 44 million abortions were performed in 2008, slightly more than in 2003 (42 million) but fewer than in 1995 (46 million). About 38 million (86%) were in developing countries, including 27 million in Asia, six million in Africa and four million in Latin America; the number of abortions increased by 2.8 million in developing countries, but declined by 0.6 million in developed regions. The worldwide proportion of pregnancies ending in abortion changed little between 1995 (22%) and 2008 (21%).

The global rise in the number of abortions was entirely due to increased population size, as the number of abortions per 1,000 women aged 15–44 declined slightly between 2003 and 2008, from 29 to 28 per 1,000, and was essentially unchanged in developing countries (29 per 1,000). Likewise, regional rates for 2008 in Africa (29 per 1,000), Asia (28 per 1,000) and Latin America (32 per 1,000) were similar to the corresponding 2003 rates. The stability in abortion rates suggests a stalling of the decline seen between 1995 and 2003, when the global abortion rate fell from 35 to 29 per 1,000. A linear regression analysis revealed that abortion rates tended to be lower in subregions where the proportion of reproductive-age women living under liberal abortion laws was higher.

Within regions, abortion rates varied widely. In Africa, for example, the rate ranged from 15 per 1,000 in Southern Africa to 38 per 1,000 in Eastern Africa; similar variation occurred in Asia (26–36 per 1,000) and Latin America (29–39). Subregional rates, like regional ones, generally changed little between 2003 and 2008; the most notable exceptions—a decrease from 24 to 15 per 1,000 in Southern Africa, and an increase from 26 to 36 per 1,000 in Middle Africa—were probably attributable at least in part to fluctuations in data quality, though a true decline in abortion incidence likely occurred in Southern Africa.

The proportion of abortions that were unsafe was slightly higher in 2008 (49%) than in 2003 (47%) and 1995 (44%). This trend was most marked in Western Asia, where the proportion rose from 42% to 60% between 1995 and 2008. Fifty-six percent of abortions in developing countries were unsafe in 2008, compared with 6% of those in developed countries.

Limitations of the analysis include the underreporting, misreporting and bias typically seen in abortion statistics. The investigators believe that their adjustments largely corrected for these problems; the intervals of certainty that they calculated suggest that the actual rates of abortion are roughly within 10% of their estimates, both globally and regionally. They further note that the stability in the global abortion rate between 2003 and 2008, following a period of decline, mirrors trends in contraceptive use, levels of which rose during the 1990s but stabilized in the ensuring decade. "Measures to reduce the incidence of unintended pregnancy and unsafe abortion," including "improving access to family planning services and safe abortion care, are crucial steps" toward reducing maternal mortality, the researchers conclude.–*P. Doskoch*

REFERENCE

1. Sedgh G et al., Induced abortion: incidence and trends worldwide from 1995 to 2008, *Lancet,* 2012, 379(9816):625–632.

HPV Tests More Sensitive Than Pap Tests for Cervical Cancer Detection

Human papillomavirus (HPV) tests that use self-collected vaginal samples are more sensitive than clinically performed Pap smears for detecting precancerous cervical lesions and invasive cervical cancer, a population-based randomized trial conducted in Mexico indicates.[1] The HPV tests were three times as effective as Pap smears in detecting cervical abnormalities of at least moderate severity, and four times as effective in detecting cervical cancer. However, HPV tests also yielded more false-positive results than did Pap smears.

Cervical cancer takes an especially great toll in developing countries, which typically lack the resources to sustain clinical screening and prevention services. HPV testing may be particularly useful in these settings, because it is less expensive and more convenient than performing and evaluating Pap smears. In addition, under optimal conditions, HPV testing is more effective than Pap smears in detecting precancerous and cancerous lesions. To examine whether this is true in a low-resource country, researchers conducted a randomized equivalence trial comparing HPV tests of self-collected vaginal samples against routine analyses of Pap smears.

From March 2006 to April 2007, investigators recruited women aged 25–65 from 540 medically underserved, largely rural communities in three Mexican states. Participants had to be enrolled in Oportunidades, a poverty-reduction program for people with limited health care access and low levels of education and nutrition; in addition, they could not be pregnant or have had a hysterectomy. Women were assigned to one of two interventions: to self-collect vaginal samples at home for HPV testing, or to have a Pap smear at a local clinic. Those in the HPV-testing group were visited at home by a nurse, who taught them how to collect a vaginal sample; the samples were then tested at a laboratory. Women who tested positive for HPV or whose Pap smear indicated abnormalities were referred for colposcopy to examine the cervix, vagina and vulva in more detail; the trial's primary endpoint was detection of cervical intraepithelial neoplasia (precancerous cellular abnormalities) of at least moderate severity, known as CIN 2.

Because some of the women who had been assigned to the self-collection group were reassigned to the Pap smear group (generally because they were not home when the nurse visited), analyses focused on the women who followed their assigned protocol—9,202 women who self-collected a vaginal sample for HPV testing, and 11,054 who underwent a Pap smear. The mean age for women in both groups was 38.

Overall, 10% of participants who had self-collected a vaginal sample tested positive for one of the HPV types that are associated with cervical cancer, while 0.4% of women who had had a Pap smear had evidence of abnormal cervical cells. Colposcopy of women with positive tests revealed that HPV testing was more effective than Pap smears in detecting precancerous or cancerous lesions: The prevalence of lesions categorized as CIN 2 or worse was 117 per 10,000 among women who had undergone HPV testing, compared with 34 per 10,000 among those who had had a Pap smear. HPV tests also detected a higher rate of invasive cervical cancer than did Pap smears (30 vs. seven per 10,000). Sensitivity analyses indicated that HPV testing was 3.4 times as sensitive as Pap smears in detecting lesions of CIN 2 or worse, and 4.2 times as sensitive in detecting cervical cancer. None of the invasive cancers in either group had spread beyond the cervix.

However, HPV testing also produced more false-positive results than did Pap smears. As a result, a positive HPV test result had a lower positive predictive value than did a positive Pap smear: Only 12% of women with positive HPV tests had CIN 2 or worse lesions, compared with 91% of those with positive Pap smears. Rates of false-positive results did not differ by age in either group.

The authors noted that the large number of false-positive HPV results—and the associated colposcopy referrals, risks of overtreatment and costs—were a major limitation of the study. Because most of these HPV-positive women will not develop precancerous or cancerous lesions, "the low positive predictive value is a burden to public health care services," they wrote. Another limitation was the absence of testing to confirm negative test results for women from both intervention groups.

Nevertheless, the authors conclude that the ability of HPV testing to detect precancerous cervical lesions and invasive cervical cancer is especially valuable for women whose limited health care access may permit only a few cancer screenings in their lifetime. "Vaginal self-sampling for HPV testing reduces the need for cytology clinics and permits an increase in screening coverage, especially in marginalized areas," they note. The challenge, they add, will be determining the most effective treatment for HPV-positive women without incurring unnecessary colposcopy costs.—*A. Kott*

REFERENCE

1. Lazcano-Ponce E, Self-collection of vaginal specimens for human papillomavirus testing in cervical cancer prevention (MARCH): a community-based randomised controlled trial, *Lancet,* 2011, 378(9806): 1868–1873.

Providers' Knowledge Of Medication Abortion Is Lacking in Guatemala

Awareness of medication abortion is almost universal among obstetrician-gynecologists in Guatemala, but far smaller proportions know the recommended regimens or have adequate knowledge of the country's abortion laws.[1] More than 90% of the obstetrician-gynecologists who participated in a national study had heard of misoprostol, but just 22–35% knew the dosages required to induce abortion at particular gestational ages. Moreover, although 73% knew that abortion is legal in Guatemala when a woman's life is in danger, 24–28% mistakenly believed that it is also permitted when a woman's health is at risk or in cases of fetal anomaly.

Because of Guatemala's restrictive abortion law—pregnancy termination is legal only to save a woman's life—as well as the stigma surrounding the procedure, women trying to obtain an abortion often use illegal providers, and unsafe abortion has been the country's fourth leading cause of maternal death for the past decade. Moreover, one of the two drugs typically used for medication abortion (mifepristone) is unavailable in Guatemala, and the other (misoprostol) is not officially indicated for abortion. Obstetrician-gynecologists have played a key role in introducing and expanding the use of reproductive health services in other countries; to explore whether practi-

tioners are in a position to play a similar role in Guatemala, the current study examined providers' knowledge of and attitudes toward medication abortion.

All members of the Guatemalan Society of Gynecologists and Obstetricians who worked in private practice were recruited for the survey from February to August 2010; nonmember colleagues working at the same sites were also invited to participate. Participants completed a multiple-choice questionnaire that asked about their social, demographic and professional characteristics and assessed their knowledge of medication abortion and its legality; the survey also included questions about their approval of this type of abortion under certain circumstances, such as anembryonic pregnancy (a pregnancy in which the fertilized egg does not develop), severe eclampsia, or fetal anomaly or death. The response rate was 71%. In addition to calculating descriptive statistics, the researchers conducted a multivariate regression analysis to identify provider characteristics associated with approval of certain uses of medication abortion.

Most of the 172 respondents were male (82%) and married (81%), and about half had at least three children and were aged 50 or older (47% each). Three-fifths had at least 20 years of medical experience (61%).

Almost all of the obstetrician-gynecologists knew of misoprostol (92%). However, only small proportions knew what dosages were recommended for abortions administered at less than nine weeks' gestation (22%) or less than 12 weeks' gestation (35%), and just one-quarter (25%) had heard of mifepristone. The vast majority of respondents knew that a woman could not obtain a legal abortion solely because she was a rape victim, poor, unmarried or younger than 18 (82–99%). More than seven in 10 providers (73%) knew that abortion performed to preserve a woman's life is legal in Guatemala, but one in four mistakenly thought it was allowed in cases of severe fetal anomaly (24%) or maternal health endangerment (28%).

Overall, 69% of respondents said they would use misoprostol and mifepristone, if available, to perform legal terminations. However, support of administering these medications in particular cases varied. Nearly nine in 10 (88%) said that they approved of medication abortion in cases of anembryonic pregnancy or of fetal death before 20 weeks' gestation, while smaller proportions (63–65%) approved of this option before 20 weeks' gestation if the fetus had multiple severe anomalies or was anencephalic (missing a major part of the brain).

In logistic regression analyses, a provider's age and number of children were associated with approval of medication abortion in selected instances. The odds of approval in cases of severe eclampsia and fetal death were greater among physicians aged 40–49 than among older providers (odds ratio, 2.0), and greater among respondents who had one or more children than among those who had none (2.2–2.3). Respondents aged 39 or younger were far more likely than those older than 49 to approve of medication abortion when women without eclampsia had a fetal death before 20 weeks' gestation (6.7). Finally, compared with childless providers, those with one or two children had elevated odds of approving of the procedure for a woman carrying a fetus with anencephaly (2.6).

The investigator acknowledges several study limitations. Providers who declined to participate may have differed from those in the sample. Furthermore, the survey included questions about mifepristone, which is not available in Guatemala, and about medication abortions performed at gestations that differed from those described in World Health Organization guidelines. Nonetheless, given the generally low acceptability of abortion in Guatemala, the researcher notes, it is encouraging that younger providers were more willing than their older peers to consider administering medication for abortion. In addition, if maternal morbidity and mortality are to be lowered, he concludes, Guatemalan obstetrician-gynecologists should make it "a professional and ethical imperative" to augment their skills and increase women's access to services.–*S. Ramashwar*

REFERENCE

1. Kestler E, Obstetrician-gynecologists' knowledge of and attitudes toward medical abortion in Guatemala, *International Journal of Gynecology and Obstetrics,* 2012, 116(2):120–123.

Nurses and Doctors Are Equally Capable Abortion Providers, Indian Study Indicates

Nurses and physicians are equally capable of assessing a woman's eligibility for manual vacuum aspiration (MVA), performing the procedure safely and effectively, and determining its completeness, according to a prospective study conducted in India.[1] All of the women who had the procedure were satisfied with it, regardless of their provider; moreover, all of those whose provider was a nurse said they would be willing to have a nurse perform any abortions they might have in the future.

India prohibits nurses and physicians who are not obstetrician-gynecologists and have not been certified to provide abortions from performing the procedures, which may compel women in rural areas—where registered abortion providers are scarce—to delay their abortion or seek one from an unauthorized provider, thus risking complications. Using a two-sided equivalence design, investigators assessed and compared the safety and efficacy of first-trimester MVAs performed by nurses with those done by identically trained physicians. The study was conducted in two of India's poorest states, Bihar and Jharkhand, where access to health services is limited. Investigators recruited 20 female providers (10 physicians and 10 nurses) from medical and nursing colleges, through local newspaper ads and from a nongovernmental organization that operates reproductive health clinics. None of the providers had experience performing abortions prior to the study, but all received 12 days of MVA training, which included doing pelvic exams to assess gestational age and abortion completeness, as well as a one-week field placement.

From July 2009 to January 2010, the providers screened 1,089 women at five clinics that mainly served low-income patients. Women who came to the clinics seeking an abortion were eligible for the study if they had been pregnant for no more than 10 weeks, had not tried to terminate their pregnancy in the previous week, lived within one hour of the clinic and were willing to return one week after the abortion for a follow-up exam. Of the 897 women who met these criteria, 449 received MVAs from nurses and 448 from physicians. Although the study was not a true randomized trial, only one provider type was present at each clinic at any given time, and women did not know in advance whether a nurse or doctor would be performing their abortion.

The study entailed two clinic visits, each of

which included an exit interview. At the first visit, the provider and a supervisor independently screened the woman for eligibility; the woman then received an MVA, and the provider and supervisor assessed its completeness. The provider observed the woman for 2–3 hours and discharged her with a supply of antibiotics, information about common complications and side effects, and instructions to call with any concerns. At the second visit, the woman received separate pelvic exams from the provider and supervisor to verify the abortion's completeness. Women with an incomplete abortion had a resuction by the supervisor.

The providers were evaluated on their ability to accurately assess gestational age, women's overall eligibility for abortion and the completeness of abortions. Their assessments were compared with those of the supervisor, which were considered the "gold standard." Other outcomes examined by the researchers were complication rates and women's overall satisfaction with their provider and the services they received.

Overall, the two provider types had equivalently low failure rates. Women's eligibility was incorrectly assessed in 4% of cases screened by nurses and 3% of those screened by physicians; most of these errors, if not detected by the supervisor, would have resulted in the erroneous inclusion of ineligible women. However, in 99% of cases, the provider's assessments of abortion completeness matched the supervisor's. In 2–3% of procedures, the provider asked for help from the supervisor, who in most cases provided support but did not intervene.

Of the 865 women who returned for the one-week follow-up, 1% from each provider group had had an incomplete abortion, but none had experienced a serious complication that required a blood transfusion or hospitalization, or that resulted in injury to the cervix, uterus or bowel. Fewer than 1% of women treated by either type of provider experienced adverse symptoms, such as cramping, abdominal pain, fever, minor bleeding or vaginal discharge. Finally, 100% of women reported satisfaction with their abortion at both exit interviews, regardless of their provider, and 98% were satisfied with the services they had received. All of the women whose provider had been a nurse said they would be willing to have a nurse perform an abortion for them in the future.

The investigators note that the study's limitations include its lack of randomization, as well as the bias that the supervisor's input may have introduced. Although the study was not truly randomized, the social and demographic characteristics of patients in the two provider groups were similar, suggesting that no systematic bias in group assignment occurred. The investigators conclude that the findings make "a compelling case" for amending India's abortion law to allow nurses to perform the procedure. Such a change in the law, they assert, would have "huge potential to reduce the incidence of unsafe abortion and its negative consequences for women's health."–*A. Kott*

REFERENCE

1. Jejeebhoy SJ et al., Can nurses perform manual vacuum aspiration (MVA) as safely and effectively as physicians? Evidence from India, *Contraception,* 2011, 84(6):615–621.

Rates of Unsafe Sex Vary By Gender Among HIV-Positive Hondurans

A study examining unsafe sexual behaviors among HIV-positive adults in Honduras found that unprotected sex is common, especially among women, individuals with a recent HIV diagnosis, those who have difficulty obtaining condoms and those who have experienced discrimination because of their infection (odds ratios, 1.8–2.6).[1] Fifty-seven percent of sexually active HIV-positive women reported inconsistent condom use with their regular, casual or commercial partners in the past 12 months, compared with 38% of their male counterparts. Levels of other risk behaviors also varied by sex. Regardless of their sexual activity, women were more likely than men to report having difficulty obtaining condoms (24% vs. 15%) and to have experienced HIV-related discrimination in the past year (65% vs. 55%).

To examine risk behaviors and STI prevalence among HIV-positive adults in Honduras, researchers conducted a cross-sectional study in 2006 in Tegucigalpa and San Pedro Sula, the two cities where most Hondurans who receive HIV care live. HIV-positive men and women aged 18 or older were recruited from public-sector HIV service providers and nongovernmental organizations; they were eligible if they were living in or receiving care in either study city, had a documented HIV test result and were able to provide written informed consent. In all, 810 individuals enrolled.

Study assessments included an audio computer-assisted interview, a physical exam by a doctor or nurse, and STI testing of blood, urine and vaginal swabs. The biologic samples were screened for chlamydia, gonorrhea, *Mycoplasma genitalium,* trichomoniasis, syphilis and herpes simplex virus type 2. The study questionnaire asked about demographic characteristics, current and recent sexual behavior, HIV knowledge, health-seeking behaviors, past-year and lifetime use of drugs and alcohol, and experiences of HIV-related discrimination. The main outcome of interest was having had unprotected sex with any partner in the past year. Chi-square and t tests were used to test for gender differences; logistic regression analyses that controlled for potential confounders, as well as study site and gender, were used to identify predictors of unsafe sex in the past year among sexually active participants.

The mean age of participants was 37, and more than half (55%) were women. Only 29% of the sample had at least a high school education; 11% were illiterate. Forty-five percent were married or in a union, and 43% were unemployed. Most respondents were receiving antiretroviral treatment (84%), and 22% had received their HIV diagnosis in the year before the survey. One-quarter had used drugs in the past 12 months, and 17% had used alcohol in the previous four weeks. Overall, 60% of participants reported experiencing discrimination; women were more likely to do so than men (65% vs. 55%).

Most respondents reported having had sex during the previous 12 months; the proportion was higher among men than women (70% vs. 58%). Among these sexually active respondents, men were more likely than women to report having paid for sex (18% vs. 4%) and having had a same-sex partner (20% vs. 5%), while a higher proportion of women than men reported having experienced forced sex (17% vs. 10%). Just 38% of women and 62% of men reported having used a condom at last sex; similar proportions (38% and 59%, respectively) reported consistent condom use with their regular partner during the past year. Overall, 57% of women and 38% of men had had unprotected sex in the past year with at least one of their partners. The main reasons for nonuse were having a regular partner and being drunk; only 20% of women and 9% of

men attributed their nonuse to their partner's already being infected. Twenty percent of all respondents—including 24% of women and 15% of men—reported having difficulty obtaining condoms. Overall, 78% of the sample tested positive for herpes, while 12% had *Mycoplasma genitalium,* 5% had trichomoniasis, 1% each had syphilis and chlamydia, and 0.2% had gonorrhea. Women were more likely than men to test positive for all but the last two.

In the bivariate analyses, participants were more likely to have had unprotected sex in the past 12 months if they were female or unemployed, had received an HIV diagnosis within the past year, had only a regular partner, had difficulty obtaining condoms or had experienced HIV-related discrimination. In multivariate analyses, the odds of having had unprotected sex were elevated among women (odds ratio, 1.9), those with a recent HIV diagnosis (2.0), those reporting difficulty in obtaining condoms (2.6) and those who had experienced discrimination (1.8).

The researchers acknowledge several limitations. The findings may not represent HIV-positive adults who receive private care or live in other regions of Honduras; in addition, selection into the study may have been affected by staff bias, and misclassification of participants' sexual activity may have occurred. Despite these limitations, the researchers note that the study—the first to assess risk behaviors and STI prevalence among HIV-positive people in Central America—found "high rates of unprotected sex among sexually active HIV-positive men and women," as well as a link between having experienced discrimination and not using condoms. They conclude that in addition to highlighting "a pressing need to strengthen prevention" efforts to reduce high-risk behaviors, the findings indicate that "it is imperative to address vulnerability and risk related to discrimination against HIV-positive individuals." *–L. Melhado*

REFERENCE

1. Paz-Bailey G et al., Unsafe sexual behaviors among HIV-positive men and women in Honduras: the role of discrimination, condom access, and gender, *Sexually Transmitted Diseases,* 2012, 39(1):35–41.

Medication Abortion Linked with Increased Risk Of Vaginal Bleeding in Subsequent Pregnancy

Among first-time expectant mothers, the risk of vaginal bleeding early in pregnancy is greater for those who have had a medication abortion than for those who have never had any type of abortion, according to a prospective cohort study of Chinese women.[1] The risk was especially elevated among women whose medication abortion resulted in curettage or complications (odds ratios, 1.6 and 2.0, respectively). The risk of vaginal bleeding early in pregnancy did not differ between women who had had a first-trimester medication abortion and those who had had a first-trimester surgical abortion.

Vaginal bleeding is a sign of a high-risk pregnancy and has been associated with past surgical abortion. To explore whether a similar association exists for nonsurgical abortions, this study compared rates of vaginal bleeding among pregnant women who had had a medication abortion and those who had had a surgical or no abortion.

From 1998 to 2001, investigators recruited women who were 4–16 weeks pregnant from 83 antenatal clinics in Beijing, Chengdu and Shanghai. Women were eligible for the study if they were aged 20–34, had not given birth before and had previously undergone one first-trimester abortion (surgical or medication) or no abortion. Participants completed questionnaires at enrollment, at 28–30 weeks and at delivery, providing information on their reproductive and medical history, including the current pregnancy. Women's reports of vaginal bleeding were examined overall and for two periods of pregnancy: before enrollment (the first period) and during follow-up (the second period). Log binomial regression analysis was used to calculate the relative risk of vaginal bleeding while controlling for study center, age, income, residence, season at conception and history of chronic disease.

A total of 14,399 women participated—of whom 4,841 had had a medication abortion, 4,705 a surgical abortion and 4,853 no abortion. The mean age at recruitment was 26. Most of the women had at least a high school degree; lived in a city; and were industrial or service workers, or farmers. Levels of tobacco and alcohol use, as well as of chronic disease, were low.

On average, women in the three groups enrolled in the study at 10–11 weeks' gestation and had their initial follow-up at 29 weeks. Up to the first follow-up, rates of vaginal bleeding among women with a history of medication abortion, surgical abortion and no abortion were 17%, 17% and 14%, respectively. After adjustments for potential confounders, the risk of vaginal bleeding was significantly higher for women who had had a medication abortion than for those who had had no abortion (relative risk, 1.2). When the relationship between medication abortion and vaginal bleeding was examined according to period of pregnancy, the increased risk was observed only in the first period (1.3). However, no differences in the risk of vaginal bleeding were found between women who had undergone a medication abortion and those who had terminated their pregnancy surgically.

When rates of vaginal bleeding during the first period of pregnancy were compared by gestational age at recruitment, women who had had a medication abortion had a higher rate at every week of gestation than women who had not had an abortion. Moreover, their rates were similar to those of women who had had a surgical abortion. No differences in rates were observed among the three groups later in pregnancy.

Finally, the investigators stratified women who had had a medication abortion according to characteristics of the abortion and then compared their risk of vaginal bleeding before enrollment with that of women with no abortion history. The risk of bleeding was elevated to a similar extent among women who had had a medication abortion before age 25 and those who had had one later; the risk also was elevated among both women with an interpregnancy interval of less than 12 months and those with longer intervals (relative risks, 1.2–1.3). However, while women who had had a medication abortion during the first seven weeks' gestation were more likely than those who had not had an abortion to report vaginal bleeding (1.3), no association between medication abortion and vaginal bleeding was apparent among women who had had a medication abortion after seven weeks' gestation. The odds of bleeding were especially high among women who had had curettage or complications following a medication abortion (1.6 and 2.0, respectively); they were much lower among women who had not had curettage or complications, though they were still higher than the odds among women

without a history of abortion (1.2 for each).

The investigators acknowledge that women who did not experience bleeding during their current pregnancy may have underreported prior abortions. They also note that given the young age and limited abortion experience of most study participants, the results may not apply to women who are older or have had multiple medication abortions. Nonetheless, the researchers conclude that the risk of vaginal bleeding early in pregnancy is more strongly associated with the previous use of mifepristone than with no abortion, especially when the medication abortion took place before seven weeks' gestation and resulted in curettage or complications.–*A. Kott*

REFERENCE

1. Yuan W et al., Mifepristone-induced abortion and vaginal bleeding in subsequent pregnancy, *Contraception,* 2011, 84(6):609–614.

A Third of Kenyans Have Genital Herpes, Including Most of Those with HIV

More than a third of Kenyan men and women are infected with herpes simplex virus type 2 (HSV-2), as are eight in 10 individuals with HIV-1, according to a nationally representative household study.[1] Furthermore, among HSV-2–infected individuals, 16% are also infected with HIV, whereas 2% of those without herpes have HIV. Characteristics associated with herpes infection include being female, HIV-positive, older or an uncircumcised male, or having an uncircumcised male partner.

Previous research has established that a synergistic relationship exists between HSV-2 infection and HIV transmission and acquisition, and that populations with high HSV-2 prevalence often have high rates of HIV infection. Few population-based estimates of HSV-2 prevalence exist for Sub-Saharan Africa, which has the world's highest rates of HIV. The present study, conducted in 2007, was Kenya's first nationally representative survey to assess the prevalence of these two infections; interviewers collected data on participants' social and demographic characteristics, history of STIs and sexual behavior, and obtained blood samples for HIV-1, HSV-2 and syphilis testing. In addition to assessing the prevalence of HIV and HSV-2, researchers used logistic regression analysis to identify associations between respondents' characteristics and herpes infection.

Among the 15,707 Kenyans aged 15–64 who completed interviews and were tested for both HIV and herpes, 35% were infected with HSV-2 (42% of women and 26% of men); of these respondents, 16% were also HIV-positive, compared with only 2% of those who did not have herpes. Of the 1,100 HIV-infected respondents, 81% also had herpes. Respondents who tested positive for HIV-1 were more likely to have HSV-2 than those who tested negative (84% vs. 38% among women, and 74% vs. 24% among men); similarly, respondents who tested positive for syphilis were more likely to have HSV-2 than those who received negative test results (78% vs. 41% among women, and 63% vs. 26% among men). In addition, herpes prevalence increased with age for both genders, and was higher among women than among men for each age-group. Between ages 15 and 24, herpes prevalence rose rapidly among females, from 7% to 34%, while it increased relatively gradually among males, from 3% to 14%. HIV prevalence was also consistently higher among women than among men; among 24-year-olds, for example, infection rates were 11% and 2%, respectively.

As expected, HSV-2 prevalence was higher among respondents who had had two or more lifetime sex partners, rather than none or one partner (55% vs. 26% for women, and 30% vs. 10% for men). Prevalence increased linearly by number of lifetime partners among both genders, but was consistently higher among women. Among men who had been sexually active during the past year, those who reported symptoms of genital ulcer disease in this period were more likely to test positive for HSV-2 (56% vs. 26%). Notably, circumcised men were less likely than their uncircumcised peers to have herpes (24% vs. 39%); similarly, women whose partners were circumcised were less likely to test positive for the virus than were those whose partners had not undergone the procedure (39% vs. 77%). Furthermore, men who had used a condom at last sex had a reduced rate of herpes infection (19% vs. 34%).

In the multivariate analysis, HSV-2 infection was associated with testing positive for HIV (adjusted odds ratios, 7.5 for women and 4.4 for men) and syphilis (3.5 and 2.4, respectively). Age was also correlated with herpes infection: Compared with respondents aged 15–24, all older age-groups had an elevated likelihood of infection (1.6–5.6). In addition, respondents who were married or cohabiting, as well as those separated or divorced, were more likely than those who had never married or cohabited to have an HSV-2 infection (1.7–2.6). Men who reported symptoms of genital ulcer disease in the past year and those who were not circumcised also had elevated odds of having HSV-2 (4.2 and 2.0, respectively), while women who had had two or more lifetime partners were more likely than those with fewer to test positive for the virus (2.6). Finally, both partners had genital herpes in 30% of the 2,708 couples tested for both HSV-2 and HIV; in 21%, only one partner was infected with HSV-2. In 10% of couples in which both partners had HSV-2, both partners also had HIV, compared with 3% of couples in which only one partner had HSV-2 and 0.4% of those in which neither partner had genital herpes.

The researchers believe their results support a clear relationship between HSV-2 and HIV infection. However, they noted several limitations of the study: its cross-sectional nature, which precluded determining the sequence of behaviors and infection; the possible underreporting of sexual activity and risk factors; and, in the absence of physical examinations, the possible misreporting of circumcision. Nonetheless, the authors assert that these findings can improve awareness of Kenya's high HSV-2 prevalence, "help identify vulnerable groups ... and opportunities to monitor and alter population risk for both HSV-2 and HIV, [and] advance our understanding of HSV-2 as a biologic cofactor in HIV acquisition and transmission." –*J. Thomas*

REFERENCE

1. Mugo N et al., Prevalence of herpes simplex virus type 2 infection, human immunodeficiency virus/herpes simplex virus type 2 coinfection, and associated risk factors in a national, population-based survey in Kenya, *Sexually Transmitted Diseases,* 2011, 38(11):1059–1066.