

Direct Maternal Mortality Among Tanzanian Women Associated with Household's Distance from Hospital

Tanzanian women's odds of maternal death due to direct causes, such as hemorrhage and eclampsia, rise sharply with the distance of their home from a hospital, according to a cross-sectional study conducted in a disadvantaged rural part of the country.¹ Women living more than 35 kilometers from a hospital had nearly four times the odds of dying from such causes as did peers living within five kilometers. In contrast, distance was not associated with the odds of maternal death from indirect causes, such as malaria, HIV and anemia. Geographic access to a hospital was no guarantee of good outcomes, however: Even though nearly three-quarters of women who lived within five kilometers of a hospital gave birth in such a facility, this group still had a high rate of death during pregnancy, childbirth or the postpartum period.

Investigators performed a secondary analysis of cross-sectional census data obtained by a 2007 household survey in five districts of Tanzania's Lindi and Mtwara regions. The survey collected sociodemographic information about all household members, and women aged 13–49 provided information about any live births they had had in the past five years, including the place and mode of delivery for births in the past year. The head of the household indicated whether any deaths had occurred in the household in recent years, and whether any such deaths among women of childbearing age had happened during pregnancy, childbirth or the postpartum period. Verbal autopsies were performed for pregnancy-related deaths that had occurred between June 2004 and May 2007, and the cause of death was classified as direct (due to obstetric factors), indirect (due to conditions aggravated during pregnancy), coincidental (due to injuries or accidents) or unknown. The investigators performed univariate analyses assessing the relationship between the pregnancy-related mortality ratio (number of pregnancy-related deaths divided by number of live births) and the straight-line distance between households and the nearest hospital and the nearest health facility of any type that

provided delivery care. They used multilevel logistic regression analysis to calculate odds ratios for these associations, adjusting for household wealth, ethnicity, district and the head of household's education level. The researchers also calculated the proportions of live births during the year before the survey that had occurred in health facilities and that were cesarean deliveries, according to distance to facilities.

Analyses were based on data from more than 818,000 people living in 226,000 households. In all, 194,000 women of childbearing age in these households had more than 64,000 live births during the study period. More than three-fourths of births were to women who lived within 25 kilometers of a hospital; nearly a fifth were to women who lived within 10 kilometers.

About a third of the live births occurred in the year before the survey, of which 29% took place in a hospital, 12% in a primary care facility (dispensary or health center) and 59% at home. Four percent were cesarean deliveries. The farther women lived from a hospital, the lower the proportion of live births that took place there and the proportion that were cesarean deliveries. For example, 72% of women living within five kilometers of a hospital gave birth there, compared with only 21% of women living more than 35 kilometers away; the proportions that were cesarean deliveries were 8% and 3%, respectively. In addition, the farther women lived from the nearest facilities of other types, the lower the proportions of live births occurring there. Some 48% and 66% of women living within a kilometer of a dispensary or health center, respectively, gave birth in those facilities.

Verbal autopsies indicated that 376 women had a pregnancy-related death during the study period. Overall, 43% of these deaths were due to direct causes, 25% to indirect causes, 1% to coincidental causes and 31% to unknown causes. Hemorrhage accounted for the largest share of death due to direct causes. Half of the deaths occurred in a facility, and a third occurred at home. Notably, 28% of the

women who died had delivered in a hospital.

The pregnancy-related mortality ratio in the full cohort was 712 deaths per 100,000 live births, and ranged from 592 per 100,000 among women who lived 15–25 kilometers from a hospital to 976 per 100,000 among those who lived more than 35 kilometers away. In adjusted multivariate analysis, the odds of mortality did not differ significantly by distance to a hospital, district, or women's ethnicity or household wealth. Compared with women who lived in a household whose head had no education, those whose head of household had completed primary school were less likely to die from pregnancy-related causes (odds ratio, 0.7); overall, the odds fell by 5% with each one-year increase in education.

The direct maternal mortality ratio increased sharply with the distance to the nearest hospital, from 111 deaths per 100,000 live births among women living within five kilometers of a hospital to 422 per 100,000 among those living more than 35 kilometers away. Relative to peers who lived within five kilometers, women who lived 25–35 kilometers away or more than 35 kilometers away were markedly more likely to experience maternal death due to direct causes (odds ratios, 2.6 and 3.7, respectively). Overall, the odds of such mortality increased by 1% with each additional kilometer of distance.

In contrast, distance to a hospital was not associated with indirect maternal mortality. Furthermore, analyses that considered all health facilities that provided delivery care (rather than just hospitals) revealed no significant associations between distance to the facility and direct or indirect maternal mortality.

The study's findings suggest that hospitals are providing life-saving obstetric care to women in labor, but also that there is room for improvement in this care, according to the investigators, as mortality was high even among women who lived close to a hospital. Limitations of the research included an inability to interview some households and some women, lack of a verbal autopsy in about a

quarter of cases of pregnancy-related death, the possibility of recall and selection biases, and lack of information on obstetric risk factors and complications. Nonetheless, taken together, the study's findings "[underpin] the need to invest into improved access to maternal care" and "suggest that quality of care is an important issue," they conclude.—S. London

REFERENCE

1. Hanson C et al., Maternal mortality and distance to facility-based obstetric care in rural southern Tanzania: a secondary analysis of cross-sectional census data in 226,000 households, *Lancet Global Health*, 2015, 3(7):e387–e395, doi: 10.1016/S2214-109X(15)00048-0.

Increase in STI Risk Seen For Women Using Injectable Contraceptives

Women who use injectable hormonal contraceptives may be at increased risk for acquiring STIs, according to a pair of secondary analyses of data from randomized trials. In a prospective cohort study of HIV-negative couples in Rakai, Uganda, women who used depot medroxyprogesterone acetate (DMPA) consistently had an elevated risk of becoming infected with herpes simplex virus 2 (HSV-2) relative to nonpregnant peers not using hormonal contraceptives (hazard ratio, 2.3).¹ And in a prospective study among women in South Africa using one of two progestin-only injectables, the risk of acquiring HIV-1 was elevated among DMPA users relative to norethisterone enanthate (NET-EN) users (1.4), especially if they were HSV-2 positive (2.0).²

The first study was conducted among HIV- and HSV-2-negative women aged 15–49 who were in long-term sexual partnerships with HIV-negative men who had enrolled in a randomized trial of male circumcision between August 2003 and July 2006. Women were excluded if they or their partner became seropositive for HIV. At enrollment and two annual follow-up visits, women and men provided information about their sociodemographic characteristics, sexual risk behaviors and health status. Women were also asked whether they were pregnant and were using oral or injectable hormonal contraceptives. At each visit, women were classified as consistently using DMPA if they reported use at both the current and previous visit, as initiating use if they reported use at only the current visit, and as discontinuing use if they reported

use at only the previous visit. Blood samples collected at each visit were tested for HSV-2 by an enzyme-linked immunosorbent assay, and positive results were confirmed by western blot. The investigators performed univariate analyses assessing the association of consistent DMPA use and HSV-2 seroconversion, and constructed multivariate regression models to identify characteristics independently associated with this outcome.

Analyses were based on 682 women who were about 24 years old, on average, at enrollment. Overall, 25% of women reported using a hormonal contraceptive at some time during the study, of whom roughly a third were consistent users of DMPA.

During an average follow-up of 1.7 person-years, 10% of women became HSV-2 seropositive, corresponding to an incidence of 5.8 per 100 person-years. By group, the incidence was 13.5 per 100 person-years among women who were consistently using DMPA, 4.3 per 100 person-years among pregnant women who were not using hormonal contraceptives and 6.6 per 100 person-years among women who were neither pregnant nor using hormonal contraceptives.

In a multivariate analysis, compared with peers who were neither pregnant nor using hormonal contraceptives, women who were consistent DMPA users had an elevated risk of HSV-2 seroconversion (hazard ratio, 2.3). In contrast, risk was not increased for those who initiated or discontinued use, or for oral contraceptive users or those who were pregnant. Women were more likely to become HSV-2 seropositive if they had had four or more lifetime sexual partners than if they had had one (3.5), and if their male partner had a secondary or postsecondary education as compared with a primary education (1.9–2.9).

One-fifth of women had a partner who was HSV-2 seropositive at baseline or became seropositive during follow-up. In this group, the incidence of seroconversion was 10.6 per 100 person-years overall, but it was 36.4 per 100 person-years among consistent DMPA users. In a multivariate analysis, women who had consistently used DMPA had a sharply elevated risk of HSV-2 seroconversion relative to nonpregnant peers who had not used any form of hormonal contraceptive (hazard ratio, 6.2). Again, no increase in risk was seen for those who had initiated or discontinued use, or for oral hormonal contraceptive users or those who had been pregnant.

The study is the first to prospectively show

that DMPA use is associated with increased risk of HSV-2 infection among HIV-negative women. The investigators caution that relatively few women became infected during the study and that follow-up intervals were long; therefore, the research should be replicated in larger studies that have shorter follow-up intervals and assess other contraceptives as well. Moreover, any elevation of HSV-2 risk associated with DMPA use should be balanced against known benefits, such as reductions in unwanted pregnancy and maternal mortality, the investigators maintain. "Increased access to other forms of highly effective, long-acting, low-dose contraceptive methods, including intrauterine devices and implants, is needed in Sub-Saharan Africa," the authors conclude.

The second study was conducted among South African women who used progestin-only injectable contraceptives while participating in a randomized trial of tenofovir for HIV-1 prevention between September 2009 and August 2012. At monthly visits, women were asked about contraceptive use and behavioral factors, and were tested for HIV-1 infection and pregnancy. The women were screened annually (or more often when indicated) for chlamydia, gonorrhea and trichomonas infection, and at baseline and the end of the study for HSV-2. All women were given condoms and standard counseling about reducing the risk of STI acquisition. The investigators used Cox proportional hazards regression analyses to estimate the difference in incident HIV-1 infection between women using DMPA and women using NET-EN.

Analyses were based on 3,141 women who had a median age of 23 at baseline; a fifth were married or cohabiting, and more than four-fifths had children. Overall, 57% of the women solely used DMPA, 35% solely used NET-EN and 8% used both but at different times during follow-up.

After a median follow-up of 13 months, the incidence of HIV-1 infection was 7.6 per 100 person-years in the cohort as a whole. It was 8.6 per 100 person-years among DMPA users, compared with 5.7 per 100 person-years among NET-EN users. In a multivariate analysis, women using DMPA were significantly more likely to acquire HIV-1 than peers using NET-EN (hazard ratio, 1.4).

Overall, 47% of women were seropositive for HSV-2 at enrollment. These women had a significantly higher adjusted risk of HIV-1 infection when using DMPA as compared with NET-EN (hazard ratio, 2.0), whereas HSV-2-

seronegative women did not.

In addition, women in several subgroups were more likely to acquire HIV-1 if they were using DMPA rather than NET-EN. In particular, risk was elevated among women who, at baseline, reported not using condoms for vaginal sex (hazard ratio, 3.9), were younger than 25 (1.4) or had chlamydia, gonorrhea or trichomonas infection (1.8). Among women who used both injectables but at different times, risk was sharply higher during periods of DMPA use than during periods of NET-EN use (4.8).

The findings suggest there may be important differences among progestin-only injectable contraceptives with regard to the risk of acquiring HIV-1, according to the investigators. They note that the findings concerning risk by HSV-2 infection status differ from those of other studies, and thus more data are needed in this area. Study limitations included possible bias and confounding, as well as the lack of comparison groups not using hor-

monal contraceptives or using injectables that contain hormone combinations, the investigators acknowledge. Nonetheless, “the present data suggest that NET-EN might be an alternative injectable drug with a lower HIV risk than DMPA, and policy makers, clinician scientists, and community stakeholders should continue to assess emerging evidence to establish whether women who prefer an injectable, in consultation with providers, should consider switching from DMPA to NET-EN in high HIV incidence settings where NET-EN is available,” they conclude.—S. London

REFERENCES

1. Grabowski MK et al., Use of injectable hormonal contraception and women's risk of herpes simplex virus type 2 acquisition: a prospective study of couples in Rakai, Uganda, *Lancet Global Health*, 2015, 3(8):e478–e486, doi: 10.1016/S2214-109X(15)00086-8.
2. Noguchi LM et al., Risk of HIV-1 acquisition among women who use different types of injectable progestin contraception in South Africa: a prospective cohort study, *Lancet HIV*, 2015, 2(7):e279–e287, doi: 10.1016/S2352-3018(15)00058-2.

No Reduction in Protection Seen Among Women Who Missed HPV Vaccine Doses After the First

It may not be necessary to give three doses of the human papillomavirus (HPV) vaccine targeting viral types 16 and 18 to achieve its full protection against cervical infection, according to a combined analysis of data from a pair of randomized controlled trials among women aged 15–25 from several world regions.¹ Four years after vaccination, the vaccine's efficacy relative to a control vaccine was 76–86% against new infection with carcinogenic HPV types 16 and 18 among women who received all three doses, and was comparable among women who received only one or two of the scheduled doses. Substantial albeit lower vaccine efficacy was observed with three doses for the closely related carcinogenic HPV types 31, 33 and 45 that are not included in the vaccine formulation. Such cross protection was not evident among women who received one dose; however, among women who received two doses, a delay in receipt of the second dose from one month to six months was associated with some cross-protective efficacy.

Investigators performed a post hoc analysis that combined data from the National Cancer Institute's Costa Rica Vaccine Trial and the PATRICIA (Papilloma Trial Against Cancer in Young Adults) trial, which was conducted in

Europe, Asia, Latin America and North America. In both trials, young women were randomized to receive three doses of the bivalent HPV-16/18 vaccine (Cervarix) or a control vaccine (the hepatitis A vaccine) at baseline, one month and six months; some women, however, failed to receive all scheduled doses.

At baseline, the women provided information about risk factors and gave a blood sample for HPV antibody testing, and, if sexually active, underwent collection of cervical cells for cytology and HPV DNA testing. Incident infections were ascertained by HPV DNA testing of cervical samples among sexually active women annually, or more often if needed. The investigators calculated differences in detection of an incident HPV infection at any one time during the four-year follow-up period between the HPV-vaccinated and control-vaccinated women by number of doses received, after excluding women who had less than a year of follow-up. They also did similar analyses for incident infections that persisted for at least six months and at least 12 months. (Persistent infection with a carcinogenic HPV type is the cause of cervical cancer.)

Vaccine efficacy against incident HPV 16 and 18 infection, the study's primary end-

point, was assessed among 24,055 women aged 15–25 women who were DNA-negative for either or both of those types at enrollment. In this subset of women, 93% received three doses of their assigned vaccine, 5% received two doses and 2% received one dose. The most common reasons for missing doses were pregnancy at the time of a scheduled dose and referral for colposcopy for further evaluation of cervical changes.

Analyses showed that efficacy of the vaccine for incident HPV type 16 or 18 infection was 77% for women receiving all three doses, 76% for those receiving two and 86% for those receiving one. None of the differences between groups were statistically significant. Efficacy against infections that persisted for at least six months and for at least 12 months were also statistically indistinguishable according to doses received. Findings were essentially the same in a more restricted subset of women that excluded those who, at the time of enrollment, tested positive for any of 14 high-risk HPV types, were HPV 16 or 18 seropositive or had cervical cytology abnormalities.

Among women who received three doses, vaccine efficacy was 60% for HPV types 31, 33 and 45. This cross protection extended to incident infections that persisted for at least six months or for at least 12 months.

In an additional analysis restricted to women in the Costa Rica Vaccine Trial who had received two doses, the efficacy of the vaccine against incident infection with HPV types 16 and 18 was similarly high whether women received their second dose one month after the first dose (i.e., on schedule) or six months after the first dose (75% and 83%, respectively). The vaccine had 68% efficacy against incident infection with HPV types 31, 33 and 45 among those receiving the second dose at six months (a value similar to that seen with all three doses), but it was not efficacious against these types when the second dose was received one month after the first.

The analysis offers new evidence that one or two doses of HPV vaccine provides protection similar to that of the full three-dose course, according to the investigators. Women were not randomized by dose, few received just one dose and regulators typically do not accept incident HPV infection as a surrogate for cervical cancer, they acknowledge; therefore, the findings are unlikely to lead to policy change. Nonetheless, “these data strongly argue for a direct assessment of one-dose efficacy of the HPV-16/18 vaccine.... If one-dose

HPV vaccine administration provides strong protection against HPV-16/18 for the long term, this approach might be what is necessary to overcome the barriers prohibiting vaccine uptake in many world regions,” the investigators note.

The author of an accompanying comment contends that the findings appear to be valid given that within each dose group, women who received the HPV vaccine and control vaccine were well matched with respect to HPV risk and other potential confounders.² Furthermore, one-time HPV detection is actually “a high bar for vaccine efficacy estimates,” as it may simply result from recent intercourse and not true infection, making it

more challenging to assess the vaccine’s true impact. “If this finding [of adequate one-dose efficacy] is confirmed, it opens up a great opportunity to extend the reach of protection using HPV vaccines to more people than we would have previously thought possible,” she concludes.—S. London

REFERENCES

1. Kreimer AR et al., Efficacy of fewer than three doses of an HPV-16/18 AS04-adjuvanted vaccine: combined analysis of data from the Costa Rica Vaccine and PATRICIA trials, *Lancet Oncology*, 2015, 16(7):775–786.
2. Brotherton JML, Could one dose of bivalent HPV vaccine prevent cervical cancer? *Lancet Oncology*, 2015, 16(7):739–740.

Risky Behavior Linked to Awareness of HIV Status Among Colombian Men Who Have Sex with Men

In a sample consisting of both men who have sex with men and transgender women, 12% of respondents tested positive for HIV, and those who did not know that they were infected had an elevated likelihood of having engaged in some risky behaviors, according to a cross-sectional study conducted in Bogotá, Colombia.¹ Six in 10 respondents who tested positive learned of their status through participation in the study, and these individuals were more likely than those who already knew their positive serostatus to have had transactional sex (49% vs. 17%) and to have recently used drugs (41% vs. 23%). Compared with seronegative participants, HIV-positive respondents were more likely to have experienced forced relocation or suffered violence.

Although HIV testing is freely available in Colombia, which has the second-highest HIV prevalence in Latin America, use of the service is uncommon, likely because of entrenched stigma and aggression toward homosexual and HIV-positive individuals. To assess the level of HIV infection in Bogotá among men who have sex with men and among transgender women, and to examine whether their characteristics and behavior vary according to their knowledge of their HIV status, researchers surveyed eligible residents over a 10-month period in 2011.

The study used respondent-driven sampling: Four men who had sex with men recruited other participants, who in turn did the same; several additional such waves of

referral resulted in a final sample of 938 men who have sex with men and 58 transgender women. Participants were eligible if they were aged 18–49, had been born male and had had sex with a man in the prior six months. All respondents were paid for their participation and for any recruits they brought into the study. They completed a questionnaire via audio computer-assisted self-interviews that asked about their social and demographic characteristics, HIV testing history, HIV status (positive, negative, unknown), history of other STIs, insurance coverage and risk behaviors, including drug and alcohol use, unprotected anal sex and transactional sex. Respondents also indicated whether they had ever been forced to move from their place of residence, and estimated, on a scale from 0 (never) to 3 (many times), how often they had been the victim of violence. Participants were given an oral HIV test and were counseled before and afterward. Those with positive test results underwent confirmatory tests and, if appropriate, received a referral for medical care. A higher proportion of HIV-positive participants than of their HIV-negative counterparts invited others of the same status to join the study.

Two-thirds of respondents were aged 24 or younger (64%), most were of low socioeconomic status (82%), and about half had attended university (47%), had a main partner (49%) and had ever taken an HIV test (54%). Two-thirds had either private (30%) or government-subsidized (33%) insurance, while

the remainder had no coverage, were covered only for emergency care or did not know their insurance status (37%). Eleven percent of respondents had at some point been forced to relocate, and 28% had exchanged sex for money, goods or services. Some 12% tested positive for HIV. Sixty percent of those with HIV—or 7% of all respondents—did not know that they were infected prior to the study; of the 40% who already knew that they were seropositive, almost all were taking antiretroviral medication.

In bivariate analyses comparing respondents’ characteristics, behaviors and experiences by awareness of HIV status, those who were unaware that they had HIV were more likely than uninfected respondents and those who knew that they were HIV-positive to have ever had transactional sex (49% vs. 17–27%) and to have used drugs (41% vs. 23–26%) or engaged in binge drinking (28% vs. 9–15%) in the last three months. However, a slightly different pattern emerged for unprotected anal sex: Prevalence was highest among respondents who were unaware that they were HIV-positive (66%) and those who were HIV-negative (62%), and lowest among participants who knew that they had HIV (38%), a finding consistent, the authors note, with evidence that “knowledge of positive serostatus tends to lead to decreases in risky sexual behavior.” Compared with HIV-negative respondents, those in the two seropositive groups were more likely to have been forced to move (18–26% vs. 10%) and had higher mean scores on the experience of violence scale (0.31–0.33 vs. 0.22). Finally, two-thirds of participants who knew they were HIV-positive had had an STI, compared with half of those who were unaware and one-third of those who were seronegative.

The researchers acknowledge that the sample included too few transgender women to analyze as a separate group and that young respondents were overrepresented (perhaps because they were more motivated by the study’s financial incentives and more engaged with their community than were older men). These limitations notwithstanding, the HIV prevalence findings corroborate those of a previous survey of the same population, and provide further evidence that HIV-positive individuals who are unaware of their status may be more likely than their peers to engage in certain risky behaviors.

Moreover, the researchers note, Colombians generally continue to struggle with

poverty, internal displacement and violence, which may have prevented respondents from obtaining HIV testing and care. They emphasize that, in addition to targeted attacks and stigma, these social issues must be taken into account when addressing “the widespread problem of undiagnosed infection among Colombian [men who have sex with men] and transgender women.”—S. Ramashwar

REFERENCE

I. Zea MC et al., HIV prevalence and awareness of positive serostatus among men who have sex with men and transgender women in Bogotá, Colombia, *American Journal of Public Health*, 2015, 105(8):1588–1595.

In Nigeria, Anti-Gay Law Associated with Increased Stigma and Discrimination

In Nigeria, fear of seeking health care and avoidance of health care rose significantly among men who have sex with men after the implementation of a law that criminalized same-sex sexual relationships.¹ In a prospective study conducted in 2013–2014 in Abuja, participants reported fear of seeking health care at 25% of study visits during the prelaw period, and the proportion increased to 38% during the postlaw period. Similarly, before the law took effect, 20% of the men reported health care avoidance; afterward, 28% of respondents did. In incidence analyses, fear of seeking health care was 2.9 times as great, and the risk of reporting no safe spaces to socialize was 3.3 times as great, in the postlaw period as in the prelaw period.

To address the lack of individual-level data assessing the effect of anti-same-sex legislation on health outcomes among men who have sex with men, the researchers assessed the associations between the 2014 law—which prohibits not only same-sex marriages and sexual relationships, but also participation in organizations and clubs for homosexuals—and reports of stigma, discrimination and use of HIV-related services. Men were eligible to participate if they were aged 16 or older, had engaged in insertive or receptive anal sex with a man in the previous year, were willing to undergo regular HIV testing and clinical monitoring for up to 18 months, and spoke English or Hausa. Participants completed a behavioral questionnaire at baseline and returned two weeks later to receive HIV counseling and test-

ing, STI screening, and clinical and laboratory examination. Quarterly visits were scheduled and included a condensed questionnaire, STI testing, and HIV counseling and testing or treatment monitoring; all participants with HIV were offered antiretroviral treatment (ART). Because the passage of the law was not anticipated at the time the primary study was initiated, the analysis of the law’s possible impact was not planned beforehand, but constituted a secondary analysis of data collected before and after implementation. In all, 707 men who have sex with men participated at baseline, of whom 404 (57%) returned for at least one follow-up visit; overall, they contributed 756 prelaw and 420 postlaw visits.

The study questionnaire asked participants about their demographic characteristics, as well as their experiences with five types of stigma and discrimination: whether the participant had ever feared seeking or avoided obtaining health care because he had sex with men, whether he had ever been verbally harassed or blackmailed, and whether he had been unable to find safe places to be with male partners. Outcomes of interest included not only reports of stigma and discrimination, but also loss to follow-up, ART status and viral suppression (having a serum HIV RNA level below 50 copies/mL). The investigators used chi-square tests to compare the demographic characteristics of prelaw participants with those of postlaw participants, as well as associations between the law and open communication with a health care provider, ART use and viral suppression. The incidence of stigma, discrimination and loss to follow-up were estimated with Poisson regression models that adjusted for age, education, religion, marital status, employment and having ever been tested for HIV.

Most men in the study were aged 25 or younger (59%), and more than 99% identified as gay or bisexual. Some 71% had attended at least secondary school; 56% were employed, 22% were unemployed and 22% were students. Fifty-eight percent of participants were Christian, while 41% were Muslim. Most participants (86%) had never married or were living with a man; 11% were married or living with a woman, and 3% were divorced, separated or widowed. More than half of the men (58%) had had an HIV test; of those who underwent testing at enrollment, 45% were HIV-positive. Only 21% of men reported ever having discussed their sexual orientation with a health care provider. Participants who

enrolled before the legislation had higher levels of education, were more likely to be unemployed, and were less likely to be Muslim and to be married to or living with a woman than those enrolled after legislation.

For all five of the stigma and discrimination measures, reports of having experienced the outcome were significantly more common during the postlaw period than during the prelaw period. For example, participants reported having ever feared seeking health care during 25% of prelaw visits and 38% of postlaw visits; they reported health care avoidance during 20% of prelaw visits and 28% of postlaw visits. Those comparisons included both baseline and follow-up visits; in analyses restricted to baseline visits, lifetime prevalence of stigma and discrimination did not differ between prelaw and postlaw visits, suggesting that those enrolled in the postlaw period were not substantially different in their lifetime experience of stigma from those enrolled before the law went into effect, and that increases in reports of stigma may be attributable to an increase in incidence.

To further explore this issue, the researchers conducted incidence analyses among the 192 participants who had completed both a baseline visit and at least one follow-up visit. For each stigma measure, the sample was further restricted to participants who had not reported that type of stigma at baseline, so that any reports of lifetime stigma experiences presumably reflected events that had occurred between baseline and follow-up. In the adjusted models, the incidence rate ratio for fear of seeking health care was 2.9 times as great in the postlaw period as in the prelaw period, while that of reporting not having safe spaces to socialize was 3.3 times as great. Other analyses suggested that being unable or unwilling to reveal homosexual behavior was associated with poorer health outcomes: HIV-positive men who had never discussed their sexual orientation with a health care provider were significantly less likely to be on ART (23% vs. 45%) and to have achieved suppression of HIV (13% vs. 29%) at enrollment than were those who had.

The researchers acknowledge several limitations, including that although they used the law’s public announcement date to separate the prelaw and postlaw periods, there were concerns within the community of men who have sex with men before that date; this may have contributed to an underestimation of the negative effect of the law. In addition, those

most likely to report avoiding health care were also the most likely to self-censor and would therefore not be available to report this outcome. Despite the limitations, the researchers note that their findings “emphasize the negative public health effect [that anti-homosexuality] legislation can cause via its restrictions on uptake of HIV prevention, treatment and care services in those most at risk for HIV transmission.” They conclude that “safe and trusted HIV prevention and treatment services are needed, particularly in countries with discriminatory legal environments.”

–L. Melhado

REFERENCE

1. Schwartz SR et al., The immediate effect of the Same-Sex Marriage Prohibition Act on stigma, discrimination and engagement on HIV prevention and treatment services in men who have sex with men in Nigeria: analysis of prospective data from the TRUST cohort, *Lancet HIV*, 2015, 2(7):e299–e306, doi: 10.1016/S2352-3018(15)00078-8.

Self-Assessment at Home Is Feasible for Follow-up Of Medical Abortion

Women who assess their status at home after having a medical abortion are as likely as those who rely on a clinic follow-up to have a safe and complete medical abortion. In a randomized controlled noninferiority trial conducted among women living in rural and urban areas of Rajasthan, India, 93% and 95%, respectively, of participants in the clinic and home follow-up groups reported complete abortions without a need for further treatment.¹ Overall, only 1% of women experienced a continuing pregnancy at follow-up, and 4–5% had incomplete abortions.

Medical abortion initiated by nine weeks' gestation is widely recognized as safe and effective, yet many women in low-resource settings have limited access to the procedure. The common requirement that women attend a follow-up visit at a clinic diminishes both the access and the acceptability of medical abortion, because a return visit may be difficult for those with limited financial resources or low autonomy. The main purpose of a follow-up visit is to detect a continuing pregnancy, which occurs in about 1% of procedures using mifepristone and misoprostol. World Health Organization recommendations state that routine clinic follow-up is not medically necessary, and a number of studies—mostly

in high-resource settings—have assessed the efficacy of having women use low-sensitivity urine pregnancy tests at home instead of requiring clinic-based testing to confirm that a complete abortion has occurred. This simple test has a high negative predictive value for detecting a continuing pregnancy, and hence carries an extremely low risk of missing one.

This noninferiority trial compared medical abortion outcomes among women who relied on either clinic follow-up or self-assessment at home. The study was conducted at three rural and three urban health centers in two districts of Rajasthan between April 2013 and May 2014. All clinics offered a range of reproductive health services and were staffed with specialists in obstetrics and gynecology. Women who chose to have a medical abortion were eligible for the study if their gestational age was nine weeks or less (as determined by bimanual pelvic examination) and they were 18 or older, agreed to a telephone or home follow-up after two weeks, had an adequate hemoglobin level and did not have a contra-indication to the procedure.

Participants were randomly assigned to one of the two follow-up groups. After receiving 200 milligrams of mifepristone orally, women were given instructions on how to take 800 micrograms of misoprostol two days later (whether a woman took this drug at a clinic or at home depended on her provider's assessment and her own preference); administration of misoprostol differed by clinic and could be sublingual, vaginal or oral. Participants assigned to clinic follow-up were asked to return 10–14 days after receiving mifepristone, whereupon a doctor or nurse assessed the abortion outcome and performed a low-sensitivity urine pregnancy test. Women in the home assessment group were given the same pregnancy test to be done 10–14 days later; they also received pictorial instructions on how to take and interpret the test, as well as information on symptoms of complications and how to contact the clinic if they experienced problems or had a positive or unclear result. Follow-up interviews with these women were conducted via telephone or home visit 12–15 days after mifepristone administration.

The primary outcome was complete abortion without need for surgical or further drug treatment, and secondary outcomes were the safety and feasibility of the procedure. The margin of noninferiority was a difference of 5% in the rate of unsuccessful abortions in

each follow-up group; the reported rate of complete abortion with this drug protocol is 95%. Chi-square and t tests were used to identify significant differences in outcomes between the groups.

The 731 women who enrolled in the study had a mean age of 27, three-fourths lived in rural areas, more than half belonged to scheduled castes or tribes and had no formal education, nearly half were literate and almost all had had a previous birth. About a third had had a previous abortion, three-fourths of which had been medical abortions. Women in the two follow-up groups were similar across all of these characteristics. The analytic sample—women who used misoprostol and whose outcome was determined—consisted of 336 and 364 individuals, respectively, in the clinic and home assessment groups (95–96% of the full samples).

Complete abortion was reported for 93% of women in the clinic follow-up arm and for 95% of those in the home assessment arm. Pregnancy testing indicated that 1% of women in each group had a continuing pregnancy at follow-up, and 4–5% had incomplete abortions (defined as retained products of conception requiring surgical intervention or additional misoprostol administration); most women with either of these outcomes subsequently underwent surgical evacuation procedures.

Overall, the rate of adverse events was 0.3%. One woman in the clinic group required a blood transfusion and hospital admission for hemorrhage, and one in the home assessment group needed intravenous fluids because of hemorrhage. Fifteen percent of women who had a scheduled follow-up reported various side effects (e.g., heavy bleeding, severe abdominal pain, fever). Among the 289 home assessment participants whose outcome was not identified in an interim clinic visit, 81% took their pregnancy test before being contacted by a researcher, and 19% did so following contact. Of women who performed the test without a reminder, 98% said it was easy to use. Women were less likely to take the test if they had experienced a side effect, lived in a rural area, belonged to a scheduled caste or tribe, or were illiterate. Ninety-six percent of participants in both study arms were satisfied with their method of abortion follow-up.

The authors note that this study provides evidence that women in low-resource, low-literacy settings can safely and feasibly assess the outcome of their early medical abortion

by using a low-sensitivity urine pregnancy test in their home, and that alteration of service delivery guidelines to allow such home assessment may be worth considering. Among the strengths of the study are that participants were representative of the underserved population in India, and that the health centers included were typical of the area's abortion-providing facilities. The use of home-based pregnancy testing, according to the researchers, appears to be an effective method for assessing medical abortion outcomes, particularly "for women living in remote areas of developing countries [and] where an additional visit to the clinic could deter women from seeking services from safe legal providers."—*J. Thomas*

REFERENCE

1. Iyengar K et al., Self-assessment of the outcome of early medical abortion versus clinic follow-up in India: a randomised, controlled, non-inferiority trial, *Lancet Global Health*, 2015, 3(9):e537–e545, doi:10.1016/S2214-109X(15)00150-3.